



National Universities Commission

Core Curriculum and Minimum Academic Standards for the Nigerian University System (CCMAS)

Allied Health Sciences 2022

Ten Unique Features

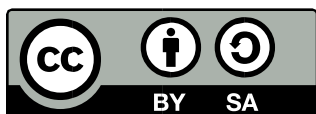
1. Guarantees the production of Allied Health Science graduates with sufficient knowledge and skills to independently diagnose health disorders in their specialties in line with the dynamics in health sciences, technology and innovation.
2. Ensures graduates are sufficiently prepared in the general principles of entrepreneurship and its specifics as it relates to the different specialties to offer health services as well as employ others without joining the unending public service unemployment queue.
3. Equip graduates in the discipline with sufficient knowledge and skills to manufacture biologicals, chemicals, equipment and instruments required in offering services.
4. Provides more hours of exposure in Faculty and programmes-based courses to produce highly competent graduates who can compete effectively for international jobs.
5. Exposes students to more hours of real practicals in teaching hospitals and other public health facilities to produce highly-skilled and competent human resources.
6. Guarantees the production of Allied Health Science graduates with sufficient knowledge and skills to independently diagnose health disorders in their specialties in line with the dynamics in health sciences, technology and innovation.
7. Ensures graduates are sufficiently prepared in the general principles of entrepreneurship and its specifics as it relates to the different specialties to offer health services as well as employ others without joining the unending public service unemployment queue.
8. Grooms graduates with (a) ability to communicate well with diverse sets of people in their clinical work; (b) good problem-solving skills; and (c) caring and understanding attitude.
9. Grooms graduates with (a) ability to communicate well with diverse sets of people in their clinical work; (b) good problem-solving skills; and (c) caring and understanding attitude.
10. Equips graduates with excellent employability skills.
10. Equips graduates with 21st century skills notably critical thinking; collaboration and teamwork.

Executive Secretary: Abubakar Adamu Rasheed

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Foreword

In furtherance of the “change” mantra of the present administration, I published a roadmap to guide my Ministry on ways of addressing the multiple problems that faced the education sector of the country shortly after my assumption of office in 2016. Known as “***Education for Change: Ministerial Strategic Plan – 2016-2019***” (updated to 2018-2022), the content of the document reaffirms government’s commitment to strengthening institutional structures and establishing innovative approaches that would quickly revamp the education sector.

The nations’ universities hold a pride of place in the execution of such a strategy, being at the peak of the educational system and charged in an overall manner, with the responsibility of catalysing the sustainable and inclusive growth and prosperity that the “change” mantra envisions. Thus, a “rapid revitalization of the Nigerian university system”, which is proceeding apace, became imperative. Improvement in research, teaching and learning facilities, deepening ICT penetration and the provision of enhanced power supply in our university campuses are some of the areas receiving stringent attention. In the same vein, the need was felt to radically review the curricula which universities had used for more than a decade so as to put in place one that would more directly address local issues, meet international standards and is fit for purpose for the training of 21st century graduates.

The National Universities Commission has concluded the review of the former *Benchmark Minimum Academic Standards (BMAS)* of 14 disciplines into those of *Core Curriculum and Minimum Academic Standards (CCMAS)* of 17 disciplines. I am therefore pleased to present these documents to the universities, the general public and the international community as I am sure that their application would tremendously uplift scholarship in our universities. I thank all and sundry who worked assiduously to bring this seminal enterprise to fruition.

Malam Adamu Adamu

Honourable Minister of Education



Preface

Section 10 (1) of the Education (National Minimum Standards and Establishment of Institutions) Act, Cap E3, Laws of the Federation of Nigeria 2004, empowers the National Universities Commission to lay down minimum standards for all universities and other degree awarding institutions of higher learning in the Federation and the accreditation of their degrees and other academic awards. The earliest efforts at giving effect to this legal framework in the Nigerian University System (NUS) started in 1989 following the collaboration between the Commission and Nigerian Universities, which led to the development of the Minimum Academic Standards (MAS) for all programmes in Nigerian universities. The MAS documents were subsequently approved by the Federal Government for use as a major instrument for quality assurance in the Nigerian University System (NUS). The documents were employed in the accreditation of programmes in the NUS for over a decade.

In 2001, the Commission initiated a process to revise the documents because the said MAS documents were essentially content-based and merely prescriptive. In 2004, the Commission developed outcome-based benchmark statements for all the programmes through a workshop that allowed for exhaustive deliberations by relevant stakeholders. Following comments and feedback from the universities to the effect that the Benchmark-style Statements were too sketchy to meaningfully guide the development of curriculum and inadequate for the purpose of accreditation, the Commission, in 2007 put in place a mechanism for the merger of the Benchmark-style Statements and the revised Minimum Academic Standards, which birthed the Benchmark Minimum Academic Standards (BMAS). The resultant BMAS, an amalgam of the outcome-based Benchmark statements and the content-based MAS clearly articulated the Learning Outcomes and competencies expected of graduates of each academic programme in Nigerian Universities without being overly prescriptive while at the same time providing the requisite flexibility and innovativeness consistent with institutional autonomy. In all, the BMAS documents were developed for the thirteen existing disciplines namely, **Administration and Management, Agriculture, Arts, Basic Medical Sciences, Education, Engineering and Technology, Environmental Sciences, Law, Medicine and Dentistry, Pharmaceutical Science, Sciences, Social Sciences and Veterinary Medicine.**

The Commission, in 2016, in its sustained commitment to make the NUS adaptable to global trends in higher education, constituted a group of relevant academic experts to develop a BMAS in **Computing**, thus increasing the number of disciplines in Nigerian Universities to fourteen.

In keeping with its mandate of making university education in Nigeria more responsive to the needs of the society, the National Universities Commission commenced the journey to restructure the BMAS in 2018, introducing in its place, the **Core Curriculum and Minimum Academic Standards (CCMAS)**, to reflect the 21st Century realities, in the existing and new disciplines and programmes in the Nigerian University System.

The new CCMAS is a product of sustained stakeholder interactions over two years. The composition of each panel took into consideration, the triple helix model, as a unique feature. This involved a blend of academic experts, academies, government (represented by NUC), professional bodies and of course, the private sector represented by the Nigerian Economic



Summit Group (NESG). In order to enrich the draft documents, copies of each discipline were forwarded to all critical stakeholders including the relevant academic units in Nigerian Universities, the private sector, professional bodies and the academies for their comments and input. These inputs along with the curriculum of programmes obtained from some foreign and renowned universities served as major working materials for the various panels constituted for that purpose.

Bearing in mind the need to adhere to covid-19 protocol as prescribed by the National Centre for Disease Control (NCDC), the Commission was compelled by prevailing circumstances to finalise the curriculum virtually. General Assemblies were also held via Zoom, comprising, the NUC Strategic Advisory Committee (STRADVCOM), Chairpersons/Co-Chairpersons of the various disciplines and Panel Members of the respective programmes. Each Discipline and Programme had NUC representatives who assisted panellists with all the tools and working materials. Several online meetings were held at programmes level, where the real business of developing the CCMAS took place. The products of the various programme-based virtual meetings were submitted to the corresponding discipline group and then to the National Universities Commission. These documents were further scrutinized and fine-tuned by a smaller group of versatile subject matter specialists and relevant private sector practitioners.

In line with the dynamism in higher education provisioning, the Commission took cognizance of complaints by the universities on the high number of General Studies (GST) courses in the BMAS, and was subsequently streamlined. Entrepreneurship courses such as Venture Creation and Entrepreneurship, and innovation found generous space. In addition, the new curriculum unbundled the Bachelor of Agriculture, Bachelor of Science in Mass Communication and the Bachelor of Architecture Programmes, while establishing some emerging specializations in these fields as obtained globally. This is in furtherance of the goal of producing fit for purpose graduates. The Allied Health Sciences was also carved out as a new Discipline from the existing Basic Medical Sciences discipline.

Preceding the completion of the curriculum review content and language editing, a 3-day validation workshop (face-to-face mode) involving critical stakeholders, including STRADVCOM, Vice-Chancellors and Directors of Academic Planning of Nigerian Universities, as well as the Nigerian Economic Summit Group (NESG) was organized by the Commission to validate the CCMAS documents, and to engender ownership for ease of implementation.

Consequent upon the afore-mentioned processes, seventeen CCMAS documents were produced for the following academic disciplines in the NUS:

1. Administration and Management
2. Agriculture
3. Allied Health Sciences
4. Architecture
5. Arts
6. Basic Medical Sciences
7. Computing
8. Communication and Media Studies
9. Education
10. Engineering and Technology
11. Environmental Sciences



12. Law
13. Medicine and Dentistry
14. Pharmaceutical Science
15. Sciences
16. Social Sciences
17. Veterinary Medicine

The CCMAS documents are uniquely structured to provide for 70% of core courses for each programme, while allowing universities to utilise the remaining 30% for other innovative courses in their peculiar areas of focus. In addition to the overall Learning Outcomes for each discipline, there are also Learning Outcomes for each programme and course. In general, programmes are typically structured such that a student does not carry less than 30 credit units or more than 48 credit units per session.

Consequently, the Commission is optimistic that the 2021 CCMAS documents will serve as a guide to Nigerian Universities in the design of curriculum for their programmes with regards to the minimum acceptable standards of input and process, as well as, measurable benchmark of knowledge, 21st century skills and competences expected to be acquired by an average graduate of each of the academic programmes, for self, national and global relevance.

Professor Abubakar Adamu Rasheed, *mni, MFR, FNAL, HLR*
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Introduction

Two Acts provide the legal framework for the quality assurance and regulatory mandates of the National Universities Commission. The first is the **National Universities Commission Act No. N81 Laws of Federation Nigeria (L.F.N.) 2004.**

*This Act sets up the National Universities Commission as a body corporate charged with the responsibility of advising the Federal and State Governments of all aspects of university education and the general development of universities in Nigeria. The second, **Education (National Minimum Standard and Establishment of Institutions) Act No. E3 L.F.N. 2004,** empowers the National Universities Commission to lay down minimum standards for all universities and other institutions of higher learning in the Federation and the accreditation of their degrees and other academic awards in formal consultation with the universities for that purpose, after obtaining prior approval therefor through the Minister, from the President.*

Following the enactment of NUC Act No. E3 L.F.N. 2004, the National Universities Commission developed the first set of Minimum Academic Standards (MAS) in 1989 for all the academic programmes existing in the Nigerian University System (NUS) at that time under the 13 major disciplines of Administration, Agriculture, Arts, Education, Engineering and Technology, Environmental Sciences, Law, Medicine and Dentistry, Management Sciences, Pharmaceutical Science, Science, Social Sciences and Veterinary Medicine. The Minimum Academic Standard served as the reference documents for the first accreditation of programmes conducted in NUS in 1990.

In its bid to review the Minimum Academic Standard documents, which was predicated on the fact that they were prescriptive, the Commission decided to develop the outcome-based Benchmark Statements for all programmes in the Nigerian University System in line with contemporary global practice in 1999. In the first comprehensive review of the Minimum Academic Standards by NUC, which was in 2004, the Commission decided to merge the Benchmark Statements and the revised Minimum Academic Standards into a new document called Benchmark Minimum Academic Standards (BMAS). These documents were approved for use in Nigerian universities in 2007. A second attempt at reviewing the BMAS was in 2011. It must however be noted that stand alone BMAS for new programmes were at different times developed by the Commission on request from some Nigerian universities.

The Current Review of the BMAS

The journey of the current curriculum review efforts commenced in 2018, when the National Universities Commission circulated the 2018 draft BMAS to all Nigerian universities and other stakeholders for their comments. In addition to the harvested comments, the curriculum of different programmes of some world-class universities were downloaded. The draft 2018 BMAS, compiled comments of Nigerian universities and other stakeholders and the downloaded curriculum of some foreign universities served as the working documents for the curriculum review panels. A multi-stakeholder approach was deployed in constituting the panels for the curriculum review exercise. The constituted panels included:

- i. Academic Staff of Nigerian universities;



- ii. Representatives of the Academies;
- iii. Representatives of Professional bodies/associations
- iv. Representatives of the private sector

In addition to the reviewers working individually and in consultation with their subject area peers, over 512 cumulative online meetings of the general assembly (Vice-Chancellors, Discipline Chairmen/Chairpersons, programme-specific reviewers and Heads/representatives of international quality assurance agencies and institutions); Discipline groups; and programme groups were held between March and November, 2021. Physical meetings were also held to finalize the curriculum review exercise.

The reviewers carried out their assignments with a view to producing a curriculum for their respective programmes that will reflect both national and international expectations. Specifically, the reviewers focused on ensuring that the emerging curriculum will be adequate to train Nigerian university students in the 21st Century. By implication and in addition to current trends in the various programmatic areas, the curriculum will be ICT oriented, promote Artificial Intelligence, enhance skills acquisition (including soft skills), inculcate and sharpen entrepreneurship mindset of students and capable of steering the deployment of evolving technologies to deliver its content.

The Core Curriculum and Minimum Academic Standards (CCMAS)

The major highlights of the new curriculum are:

1. Change of nomenclature from **Benchmarks Minimum Academic Standards (BMAS)** to **Core Curriculum and Minimum Academic Standards (CCMAS)**;
2. The curriculum provides for 70% minimum core courses requirements for graduation. Nigerian universities are expected to provide the remaining 30%;
3. In consonance with global best practice, the curriculum is to stimulate blended learning in its delivery;
4. Mass Communication has been unbundled to create a distinct discipline of Communications comprising degree programmes in Advertising, Broadcasting, Development Communication Studies, Film and Multimedia, Information and Media Studies, Journalism and Media Studies, Mass Communication, Public Relations and Strategic Communication;
5. Agriculture has been unbundled into programmes in its contributing components of B.Sc Agricultural Economics, B.Sc. Animal Science, B.Sc. Crop Science and B.Sc. Soil Science;
6. The unbundling of Architecture and introduction of Architecture as a new discipline with programmes like Architecture, Architectural Technology, Furniture Design, Interior Architecture Design, Landscape Architecture and Naval architecture;
7. The split of the Basic Medical Sciences discipline into two – Basic Medical Sciences and Allied Health Sciences;
8. Reduction of the General Studies (GST) course from 36 credit units to 12 credit units of 6 courses as follows:
 - i. Communication in English;
 - ii. Nigerian People and Culture;
 - iii. Philosophy, Logic and Human Existence;
 - iv. Entrepreneurship and Innovation;
 - v. Venture creation; and
 - vi. Peace and Conflict resolution.



9. Entrepreneurship has been repackaged with the introduction of programme-specific entrepreneurship;
10. The number of academic disciplines has been increased from 14 to 17 as follows:

- i. Administration and Management
- ii. Agriculture
- iii. Allied Health Sciences
- iv. Architecture
- v. Arts
- vi. Basic Medical Sciences
- vii. Communications and Media Studies
- viii. Computing
- ix. Education
- x. Engineering and Technology
- xi. Environmental Sciences
- xii. Law
- xiii. Medicine and Dentistry
- xiv. Pharmaceutical Science
- xv. Sciences
- xvi. Social Sciences
- xvii. Veterinary Medicine

Having reviewed the curriculum of Nigerian universities, the next steps will include training and retraining of academic staff of Nigerian universities to effectively deliver the content of the curriculum.

Glossary of Course Codes

These are the three letter codes for the identification of courses offered in the various programmes in the Allied Health Sciences Discipline as well as courses offered in other Disciplines covered in the CCMAS for the Nigerian University System. They are in three categories dictated by the sources of courses involved:

Category A: Course codes for the General Courses offered by all students.

Category B: Course codes for Basic Science Courses offered in the Allied Health Sciences Discipline.

Category C: Course codes for Core Courses offered by the various programmes in the Allied Health Sciences Discipline.



Table 1: The List of Programmes and their Codes**Category A: General Studies****Table 1.1**

| Programme | Course Code |
|--|-------------|
| General Studies Courses offered at the University Level by all students. | GST |
| Entrepreneurial Courses offered at the University Level by all Students | ENT |

Category B: Common Basic Science courses

The basic science courses which students of most Degree programmes in Allied Health Sciences Discipline have to register for at the 100 Level are:

Table 1.2

| Course Code | Course Title | Units |
|-------------|----------------------------------|-------|
| BIO 101 | General Biology I | 2 |
| BIO 102 | General Biology II | 2 |
| BIO 107 | General Biology Practical I | 1 |
| BIO 108 | General Biology Practical II | 1 |
| CHM 101 | General Chemistry I | 2 |
| CHM 102 | General Chemistry II | 2 |
| CHM 107 | General Chemistry Practical I | 1 |
| CHM 108 | General Chemistry Practical II | 1 |
| COS 101 | Introduction to Computer Science | 3 |
| MTH 101 | Elementary Mathematics I | 2 |
| PHY 101 | General Physics I | 2 |
| PHY 102 | General Physics II | 2 |
| PHY 107 | General Physics Practical I | 1 |
| PHY 108 | General Physics Practical II | 1 |

Common Discipline Courses**Table 1.3**

| Course | Course Title | Unit |
|---------|---|------|
| ANA 201 | Introductory Anatomy & Gross Anatomy of Upper and Lower Limbs | 2 |
| ANA 202 | Histology of Basic Tissues | 2 |
| ANA 203 | General Embryology | 2 |
| ANA 204 | Gross Anatomy of Thorax, Abdomen, Pelvis and Perineum | 2 |
| ANA 205 | Systemic Histology | 2 |
| ANA 206 | Systemic Embryology | 2 |
| ANA 211 | Systemic and Functional Anatomy | 2 |
| ANA 212 | Regional Anatomy | 2 |



| | | |
|---------|--|---|
| BCH 201 | General Biochemistry I | 2 |
| BCH 202 | General Biochemistry II | 2 |
| BCH 203 | General Biochemistry Practical | 1 |
| MCB 201 | Introduction to General Microbiology | 2 |
| BCH 304 | Chemistry and Metabolism of Amino Acids and Proteins | 2 |
| BCH 305 | Chemistry and Metabolism of Nucleic Acids | 2 |
| PIO 201 | Introduction to Physiology | 2 |
| PIO 202 | Principles of Cell Physiology | 2 |
| PIO 203 | General Physiology | 2 |
| PIO 204 | Introduction to Laboratory Physiology | 2 |

Category C

Table 1.4

| S/N | Course Code | Programme |
|-----|-------------|-----------------------------------|
| 1. | ANA | Anatomy |
| 2. | BCH | Biochemistry |
| 3. | BIO | Biology |
| 4. | CHM | Chemistry |
| 5. | COS | Computing Science |
| 6. | ENT | Entrepreneurship |
| 7. | GST | General Studies |
| 8. | MCB | Microbiology |
| 9. | MLS | Medical Laboratory Science |
| 10. | MTH | Mathematics |
| 11. | NSC | Nursing Science |
| 12. | NUT | Human Nutrition |
| 13. | OPT | Optometry |
| 14. | PIO | Physiology |
| 15. | PAT | Pathology |
| 16. | PHA | Pharmacology |
| 17. | PHY | Physics |
| 18. | PST | Physiotherapy |
| 19. | PSY | Psychiatry |
| 20. | RAD | Radiography and Radiation Science |
| 21. | STA | Statistics |
| 22. | ZOO | Zoology |



Preamble

The Core Curriculum and Minimum Academic Standards (CCMAS) are designed for the education and training of undergraduate students wishing to obtain first degrees in the different areas of Allied Health Sciences in Nigerian University System. Presented in this section are the basic operational elements that serve to define the minimum academic standards required to achieve the cardinal goal of producing graduates in Allied Health Sciences with sufficient academic background to face the challenges of a developing economy in an increasingly globalized economy.

It is pertinent to note that this CCMAS document is expected to guide institutions in the design of curricula for their Allied Health Sciences programmes by stipulating the minimum requirements. Being such, institutions are encouraged to take due cognizance of the CCMAS while bringing necessary innovation to the content and delivery of their programmes towards achieving the overall goal of Allied Health Sciences education and training in the country.

Programmes and Degrees

The programmes are **Allied Health Sciences** which covers the following degree areas.

Table 1.5 : List of Programmes and Degrees

| S/N | Programme | Degree(s) in view |
|-----|--|-------------------|
| 1. | Audiology | B.AUD |
| 2. | Complementary and Alternative Medicine | B.Sc. CAM |
| 3. | Dental Technology | B.Sc. DNT |
| 4. | Dental Therapy | B. DT |
| 5. | Environmental Health Science | B.EHS |
| 6. | Health Care Administration and Hospital Management | B.Sc. HAM |
| 7. | Health Information Management | B.HIM |
| 8. | Information Technology and Health informatics | B.Sc. ITH |
| 9. | Medical Laboratory Science | BMLS |
| 10. | Nursing Sciences | B.N.Sc |
| 11. | Human Nutrition and Dietetics | B.Sc. |
| 12. | Occupational Therapy | B.OT. |
| 13. | Optometry | O.D |
| 14. | Pharmacology | B.Sc. PHA |
| 15. | Physiotherapy | DPT |
| 16. | Prosthetics and Orthotics | B.Sc. P&O |
| 17. | Public Health | B.Sc. |
| 18. | Radiography | B.Rad |
| 19. | Speech-Language Therapy | B.SLT |



Philosophy, Aims and Objectives of Allied Health Sciences

Philosophy

The broad philosophy of training in the Allied Health Sciences is to:

1. provide sound academic and professional background for the production of Allied Health Science professionals who would be capable of working anywhere in Nigeria and the world;
2. train Allied Health Science professionals who would meet global standards and who could undertake further training towards specialisation; and
3. train professionals with sufficient management ability to play leadership role in the health sector and sound entrepreneurship skills in establishing self, and employing others, in training and general practice of the profession as applicable within enabling laws.

Objectives

The main objectives of the bachelor/doctor honours Degree programmes in Allied Health Sciences are to:

1. provide students with a broad and balanced foundation knowledge and practical skills to enable them perform effectively in clinical diagnostic, preventive, rehabilitative services, therapeutic, public health, academics and quality assurance; and function independently or in collaboration with other members of the health team in the care of individuals and groups at all levels of health care;
2. involve the students in an intellectually stimulating and satisfying experience of learning, studying, research, creativity and innovation;
3. inculcate in students a sense of enthusiasm for the programme; an appreciation of its application in different contexts (in areas such as health services, food and beverages, pharmaceutical industries, utility departments such as water corporations; waste management and research institutions, and many other);
4. develop in students, the ability to apply knowledge and skills from their respective programmes to the solution of theoretical and practical problems in the health sector;
5. provide students with a knowledge and skills base from which they can proceed to further studies in specialised areas involving health sciences; and
6. empower graduates of Allied Health Sciences with skills that will enable them engage in entrepreneurship and income yielding ventures.

Learning Outcomes

Graduates of the Allied Health Sciences will demonstrate;

Regime of Subject Knowledge

1. Understanding of the concepts, theories, and principles related to their subject areas
2. Ability to apply requisite knowledge and understanding to develop creative solutions to qualitative and quantitative problems in the health care system.
3. Understanding of community orientation through aligning organisational priorities with the values and needs of the community, including cultural values
4. Knowledge and ability to search and retrieve information and materials related to professional and practice issues
5. Ability to develop, analyse, interpret and evaluate results of health related research and the use of administrative and clinical information technology in decision making and performance improvement



6. Capacity for continuing self development and further learning for effective professional practice.(CPD)

Competencies and Skills

1. Effective communication skills (art of language, verbal, non verbal, media communication) and ability to successfully lead and facilitate group activities
2. Ability and skills to prepare and make cogent scientific presentations to different audiences
3. Influence and impact skills demonstrated by the ability to persuade, convince and influence individuals and groups for support on a position, project or issues of importance in the health sector
4. Interpersonal skills, that relates to the ability to interact with others and to engage in team-work, ability to understand other people, especially consumers of health care for harmony.
5. Management and organizational skills typified by the ability to plan and implement staff development practices, efficient and effective modes of working and other management practices that represent best practices to optimize work output.
6. Ability to evaluate own desires and prospects for a career as an entrepreneur and to develop meaningful professional direction after graduation.

Behavioural Attributes

1. Ability to recognise the uniqueness and importance of individuals especially patients in health situations.
2. Professionalism consistently exhibited by ethical behaviour, sound professional
3. practices, social accountability and the desire to act in a way that is consistent with one's values.
4. Conduct that comply with the legal and regulatory requirements of healthcare
5. professionals and which are not detrimental to the safety, health and wellbeing of patients.
6. Ability to establish, and sustain inter and intra professional relationships and collaborative team work where health members view one another with respect and dignity.

Assessment

It is essential that the procedure used for students' assessment should correspond to the knowledge, abilities and skills that are to be developed through their degree programme. These should be based on the following:

1. written examinations;
2. clinical/Practical examination;
3. laboratory reports/records;
4. problem-solving exercises;
5. oral presentations; and
6. project work and researches.

Additional assessment methods may include

1. Essay assignments
2. Laboratory exercises
3. Seminars and Tutorials (Literature surveys and evaluation)
4. Collaborative project work
5. Presentations/Illustrations on project work reports/displays.
6. Reports on external/field trips/laboratory postings as appropriate



The additional methods listed could be used as continuous assessment that should contribute to the final score (30/40) as applicable to different universities.

Admission Requirements and Duration of the Programmes

There are two different pathways by which candidates can be admitted into programmes in the discipline: the Unified Tertiary Matriculation (UTME) and Direct Entry. To be admitted into the Allied Health Sciences programmes the candidate must meet these entry requirements.

Unified Tertiary Matriculation Examination (UTME) Mode

Minimum of five credit level passes including English Language, Mathematics, Biology, Physics and Chemistry at O'level or SSCE in not more than two sittings in addition to other requirements by specific programme with acceptable level of pass in the UTME conducted by the Joint Admission and Matriculation Board(JAMB).

Direct Entry Mode

First degree in relevant discipline, A' level in relevant science subjects at not less than B grade in addition to other requirements by the specific programme.

Duration of the Programme

The minimum duration of programmes for Allied Health Sciences is five academic session or 10 consecutively-run semesters for candidates who enter through the UTME mode. Direct Entry candidates admitted to the 200 level of their programmes will spend a minimum of four academic sessions or eight (8) consecutively-run semesters. However, there are programmes run for four years whose duration should be eight (8) semesters for UTME or six (6) semesters for Direct Entry.

The duration for Doctor of Physiotherapy and Doctor of Optometry degrees is six (6) years for UTME mode and five (5) years for Direct Entry.

A student will not be allowed to exceed an additional 50 per cent of the duration of the programme if he/she fails to graduate within the minimum number of years.

Graduation Requirements

The minimum number of credit units for the award of a degree is 120 units (four years), 150 units (five years) and 180 units (six years), subject to the usual Department and Faculty requirements and duration of study. A student shall therefore qualify for the award of a degree when he has met the conditions.

The minimum credit load per semester is 15 credit units.

For the purpose of calculating a student's cumulative GPA(CGPA) in order to determine the class of Degree to be awarded, grades obtained in all the courses either compulsory or optional and whether passed or failed must be included in the computation.

Even when a student repeats the same course once or more before passing it or substitutes another course for a failed optional course, grades scored at each and all attempts shall be included in the computation of the GPA. Pre - requisite courses must be taken and passed before a particular course at a higher level.



General Definition of Common Terms and Principles Governing the Course Unit System and Graduation

Course Unit System

All programmes in the Nigerian University System (NUS) shall be run on a modularised system, commonly referred to as Course Unit System. All courses should therefore be sub-divided into more or less self-sufficient and logically consistent packages that are taught within a semester and examined at the end of that particular semester.

Credits are weights attached to a course. One credit is equivalent to one hour per week per semester of 15 weeks of lectures or three hours of laboratory/studio/ workshop work per week per semester of 15 weeks. In addition to the current 15 weeks semester system, universities should be encouraged to inaugurate a blended system which is based partly on physical contacts and partly using virtual or online platforms.

Definition of Course Unit System

This should be understood to mean a quantitative system of organisation of the curriculum in which subject areas are broken down into unit courses which are examinable and for which students earn credit(s) if passed. The courses are arranged in progressive order of complexity or in levels of academic progress such as Level or year I courses are 100, 101 and many others and Level II or year II courses are 200, 202. The second aspect of the system is that courses are assigned weights allied to Units.

Units

Consist of specified number of student-teacher contact hours per week per semester. Units are used in two complementary ways: one, as a measure of course weighting, and the other, as an indicator of student work load. As a measure of course weighting for each Unit course such as HIS 105, ZOO 203, ARCH 504, the credit unit to be earned for satisfactorily completing the course is specified; such as a 2-credit unit course may mean two 1-hour lecture per week per semester or one 1-hour lecture plus 3-hour practical per week per semester.

As a measure of work load, "One Credit Unit" means one hour of lecture or one hour of tutorial per week per semester. For other forms of teaching requiring student teacher contact, the following equivalents may apply: two hours of seminar: three hours of laboratory or field work, Clinical practice/practicum, studio practice or stadium sporting activity, six hours of teaching practice; four weeks of industrial attachment where applicable.

Normally, in Course Credit System, courses are mounted all year round, thus enabling students to participate in examinations in which they are unsuccessful or unable to participate on account of ill health or for other genuine reasons. In such a system, no special provisions are made for re-sit examinations.



Grading of Courses

Grading of courses shall be done by a combination of percentage marks and letter grades translated into a graduated system of Grade Point as shown in Table 1.6:

Grade Point System

Table 1.6

| Mark % | Letter Grade | Grade Point |
|----------|--------------|-------------|
| 70 – 100 | A | 5.0 |
| 60 – 69 | B | 4.0 |
| 50 – 59 | C | 3.0 |
| 45 – 49 | D | 2.0 |
| 40 – 44 | E | 1.0 |
| 0 – 39 | F | 0 |

Grade Point Average and Cumulative Grade Point Average

For the purpose of determining a student's standing at the end of every semester, the Grade Point Average (GPA) system shall be used. The GPA is computed by dividing the total number of Units x Grade Point (TUGP) by the total number of units (TNU) for all the courses taken in the semester as illustrated in Table 1.7.

The Cumulative Grade Point Average (CGPA) over a period of semesters is calculated in the same manner as the GPA by using the grade points of all the courses taken during the period.

Calculation of GPA or CGPA

Table 1.7

| Course | Units | Grade Point | Units x Grade Point (UGP) |
|----------------|----------------|-----------------|----------------------------------|
| C ₁ | U ₁ | GP ₁ | U ₁ x GP ₁ |
| C ₂ | U ₂ | GP ₂ | U ₂ x GP ₂ |
| - | - | - | - |
| - | - | - | - |
| C _i | U _i | GP _i | U _i x GP _i |
| - | - | - | - |
| - | - | - | - |
| C _N | U _N | GP _N | U _N x GP _N |
| TOTAL | TNU | | TUGP |

$$TNU = \sum_{i=1}^N U_i \quad TUGP = \sum_{i=1}^N U_i * GP_i \quad CGPA = \frac{TUGP}{TNU}$$

Degree Classifications

The determination of the class of degree shall be based on the Cumulative Grade Point Average (CGPA) earned at the end of the programme. The CGPA shall be used in the determination of the class of degree as summarised in Table 1.8. It is important to note that the CGPA shall be calculated and expressed correct to two decimal places.



Degree Classification

Table 1.8

| CGPA | Class of Degree |
|-------------|---------------------------------------|
| 4.50 – 5.00 | First Class Honours |
| 3.50 – 4.49 | Second Class Honours (Upper Division) |
| 2.40 – 3.49 | Second Class Honours (Lower Division) |
| 1.50 – 2.49 | Third Class Honours |
| 1.00 – 1.49 | Pass |

Unclassified Degree Categories

| Cumulative Grade Point Average (CGPA) | Category Of Degree |
|--|---------------------------|
| 2.4 – 5.00 | Pass |

Probation

Probation is a status granted to a student whose academic performance falls below an acceptable standard. A student whose Cumulative Grade Point Average is below 1.00 at the end of a particular year of study, earns a period of probation for one academic session. For unclassified degree, a student with CGPA less than 2.40 in a semester earns probation.

Withdrawal

A candidate whose Cumulative Grade Point Average is below 1.00 at the end of a particular period of probation should be required to withdraw from the University. For unclassified degree, a student with CGPA below 2.40 for four consecutive semesters of probation should be required to withdraw from the programme. Where possible, consideration may be given to a student withdrawn from a programme of study for transfer to any other programme within the same university.

Subject to the conditions for withdrawal and probation, a student may be allowed to repeat the failed course unit(s) at the next available opportunity, provided that the total number of credit units carried during that semester does not exceed 24, and the Grade Points earned at all attempts shall count towards the CGPA.

Evaluation

Modes of Student Assessment

All courses taken must be evaluated and a final grade given at the end of the semester. To arrive at the final grade, the evaluation must be a continuous process consisting of some or all of the following where applicable:

Continuous Assessment

Continuous assessment shall be done through essays and tests. Scores from continuous assessment shall normally constitute 30-40 per cent of the full marks for courses which are primarily theoretical.

For courses which are partly practical and partly theoretical, scores from continuous assessment may constitute 40% of the final marks.

For courses that are entirely practical, continuous assessment shall be based on a student's practical work or reports and shall constitute 100% of the final marks.



Examinations

In addition to continuous assessment, final examinations should normally be given for every course at the end of each semester. All courses shall be graded out of a maximum of 100 marks comprising:

| | |
|---|-----------|
| Final Examination: | 60% - 70% |
| Continuous assessment (Quizzes, Homework, Tests and Practical): | 30% - 40% |

External Examination System

The involvement of external examiners from other universities is a crucial quality assurance requirements for all courses in Nigerian University System. In this regard, external examiner should go beyond mere moderation of examination questions to examining of examination papers to scope and depth of examination questions vis a vis the curricular expectation.

SIWES Rating and Assessment (where applicable)

There should be a mandatory 6 months uninterrupted SIWES training at the 300- or 400-level during which students can gain work experience in laboratories, hospitals or tertiary institutions in fields relevant to the course and or job market. For professional courses, the specific requirements of the appropriate regulatory body should be met.

Students' Evaluation of Courses

There should be an established mechanism to enable students to evaluate courses delivered to them at the end of each semester. This should be an integral component of the course credit system to serve as an opportunity for feedback on the effectiveness of course delivery. Such an evaluation which should be undertaken by students at the end of each course, should capture, among others:

1. improvement in the effectiveness of course delivery;
2. continual update of lecture materials to incorporate emerging new concepts;
3. effective usage of teaching aids and tools to maximize impact of knowledge on students;
4. improvement in students' performance through effective delivery of tutorials, timely in; and
5. presentation of continuous assessment and high-quality examination.

It is very important that students' evaluation of courses be administered fairly and transparently through the use of well-designed questionnaires. The completed questionnaires should be professionally analyzed and results discussed with the course lecturer(s) towards improvement in course delivery in all its ramifications.



B.Aud Audiology

Overview

This curriculum describes the development of audiology as a course of study in Nigeria. As a newly introduced programme, a brief introduction of what the profession is all about and its justification for study in Nigerian universities are included in this document.

Audiology is the study of hearing- since the inner ear is also acquired for balance, this is also included in the study. In medical terms, it is the branch of science dedicated to the study of hearing, balance and their associated disorders.

The graduates of the programme should show skills and competence in conducting basic research in audiology and capability to proceed to postgraduate level of M.Sc or Ph.D. and be able to synergise with other medical/health-care providers within the health care facility. In addition, they will have competence in ear impression taking and be able to recommend, select and fit hearing aids and also take on trouble-shooting issues on hearing aids.

Furthermore, they will acquire competence in the performance of intra-operative diagnostic procedure during related otological surgery and be able to execute noise survey, screening audiometry and hearing conservation procedures in industries, communities or schools. They will also be able to recommend appropriate assistive listening devices such as frequency modulation (FM) systems, show competence in clinical assessment of tinnitus (ringing in the ear), vertigo (dizziness) and demonstrate appropriate counselling, treatment or rehabilitation skill as applied to audiology and last but not the least be able to write a comprehensive clinical report and making appropriate referral where necessary.

The philosophy as well as objective of the course are well stated and summarised for ease of understanding. This curriculum is structured to produce a well-grounded, competent professional in the field of audiology for the country Nigeria and the global community. Necessary tools for the realisation of the objective of this curriculum in terms of equipment, staffing, ICT, and other ancillary factors are included in this document.

Philosophy

The philosophy of Bachelor's degree programme in Audiology (B. Aud) is to train highly skilled audiologists, who shall continue to search for more knowledge and professional skills and apply same to provide specialised services for hearing health care needs of patients and the community. The specialised services will also include/involve treatment, habilitative and rehabilitative managements of clients/patients with auditory limitations.

Objectives

At the end of the five –year degree programme the audiology graduate will be able to:

1. discuss the anatomy, physiology and pathophysiological concepts related to auditory and vestibular or oto-neurologically-related disease causation, ill- health, and the basic principles of audiological battery of tests, diagnosis, treatment and rehabilitation;
2. select the appropriate therapeutic modality during the care of patient;
3. demonstrate the rationale behind the choice of therapeutic modalities in rehabilitating patients with hearing impairment and/or vestibular disorder;



4. participate in the decisions of a health care team with respect to the design of a total rehabilitation programme including the initiation and discontinuation of therapy;
5. identify the limitations, indications and contra-indications of audiology;
6. appreciate the inter-relationship between medical, psychosocial, economic and cultural factors affecting the patient with hearing deficit;
7. operate the various types of equipment used in Audiology;
8. identify the role of the Audiologist in health care, and in other settings such as schools, industries and rehabilitation centres;
9. demonstrate an appreciation of ethical and professional responsibilities of Audiology professionals;
10. participate in research work in the field of Audiology;
11. assess and analyse community health needs involving hearing impairment;
12. apply basic principles of evidence-based practice in audiology; and
13. acquire the necessary proficiency and enough managerial skills to practice and also manage audiology clinic either in Nigeria or abroad.

Unique Features of the Programme

The unique feature of this programme include grooming of graduates with:

1. ability to communicate well with diverse sets of people in their clinical work;
2. good problem solving skills;
3. team spirit;
4. caring and understanding attitude;
5. good analytical skills;
6. adaptability; and
7. potential for hard work and good reasoning skills

Employability Skills

1. Competence in taking a detailed audiological case history of patients/clients.
2. Competence in the use of basic clinical otoscopy to detect cerumen (impacted wax), foreign body and infections in the auditory system.
3. Acquire competence in the use of hearing and vestibular testing equipment for practical purposes.
4. Competence in selecting appropriate battery of tests and carry out differential diagnostic tests.
5. Ability to diagnose hearing and vestibular disorders using all necessary diagnostic tools;
6. Competence in conducting basic research in audiology and capability to proceed to post-graduate level of M.Sc or Ph.D.
7. Ability to synergise with other medical/health-care providers within the health care facility;
8. Competence in ear impression taking.
9. Ability to recommend, select and fit hearing aids and take on trouble-shooting issues on hearing aids.
10. Competence in the performance of intra-operative diagnostic procedure during related otological surgery.
11. Ability to execute noise survey, screening audiometry and hearing conservation procedures in industries, communities or schools.
12. Ability to recommend appropriate assistive listening devices such as frequency modulation (FM) systems.
13. Competence in clinical assessment of tinnitus (ringing in the ear), vertigo (dizziness) and demonstrate appropriate counselling, treatment or rehabilitation skill as applied to audiology.



14. Ability to write a comprehensive clinical report and making appropriate referral where necessary.
15. Demonstrable competence in taking a detailed audiological case history of patients/clients and in the use of basic clinical otoscopy to detect cerumen (impacted wax), foreign body, infections in the auditory system and many others.
16. Competence in the use of hearing and vestibular testing equipment for practical purposes and also show competence in selecting appropriate battery of tests and carry out differential diagnostic tests as well as ability to diagnose hearing and vestibular disorders using all necessary diagnostic tools.

21st Century Skills

1. Collaboration and team work
2. Creativity and imagination
3. Critical thinking
4. Problem solving
5. Flexibility and adaptability
6. Information Literacy
7. Leadership
8. Civic literacy and citizenship
9. Social responsibility
10. Technology literacy
11. Initiative

Admission and Graduation Requirements

Admission Requirements

There are two different pathways by which candidates can be admitted into the programmes

Five-Year Degree Programme (UTME)

Direct Entry

Five-Year Degree Programme

The minimum academic requirements is credit level passes in five subjects at Senior Secondary Certificate (or its equivalent) including English Language, Mathematics, Physics, Chemistry and Biology at not more than two (2) sittings and an acceptable pass mark at the Unified Tertiary Matriculation Examination conducted by the Joint Admission and Matriculation Board (JAMB).

Direct Entry

Candidate seeking admission through this mode should in addition to the UTME requirements possess:

1. Passes in Physics, Chemistry and Biology at the Higher School Certificates or Advanced Level of General Certificate Examination or its equivalent; OR
2. An acceptable First Degree of minimum of second class lower in relevant Biological or Physical Sciences Discipline.



Graduation Requirements

Candidate must have pass a minimum of 150 credit units for UTME and 120 credit units for Direct Entry.

Global Course Structure

100 Level

| Course code | Course Title | Unit(s) | Status | LH | PH |
|-------------|---------------------------------|-----------|--------|----|----|
| GST 111 | Communication in English | 2 | C | 15 | 45 |
| GST 112 | Nigerian Peoples and Culture | 2 | C | 30 | - |
| BIO 101 | General Biology I | 2 | C | 30 | - |
| BIO 102 | General Biology II | 2 | C | 30 | - |
| CHM 101 | General Chemistry I | 2 | C | 30 | - |
| CHM 102 | General Chemistry II | 2 | C | 30 | - |
| CHM 107 | Practical Chemistry I | 1 | C | - | 45 |
| CHM 108 | General Practical Chemistry II | 1 | C | - | 45 |
| MTH 101 | Elementary Mathematics I | 2 | C | 30 | - |
| MTH 102 | Elementary Mathematics II | 2 | C | 30 | - |
| PHY 101 | General Physics I | 2 | C | 30 | - |
| PHY 102 | General Physics II | 2 | C | 30 | - |
| PHY 103 | General Physics 111 | 2 | C | 30 | - |
| PHY 107 | General Experimental Physics I | 1 | C | - | 45 |
| PHY 108 | Practical Physics 1I | 1 | C | - | 45 |
| PSY 101 | Psychology of Child Development | 1 | C | 15 | - |
| | Total | 27 | | | |

200 Level (Professional Stage I)

| Course Code | Course Title | Unit(s) | Status | LH | PH |
|-------------|--|---------|--------|----|----|
| GST 212 | Philosophy, Logic and Human Existence | 2 | C | 30 | - |
| ENT 211 | Entrepreneurship and Innovation | 2 | C | 15 | 45 |
| PIO 201 | Introductory Physiology & Blood | 2 | C | 30 | - |
| PHA 201 | General Pharmacology | 1 | C | 15 | - |
| PST 201 | Rehabilitation Physics/Biophysics | 1 | C | 15 | - |
| PST 202 | Introduction to Medical Rehabilitation | 1 | C | 15 | - |
| MCB 201 | Introduction to Microbiology and Infection Control | 2 | C | 30 | - |
| ANA 201 | Anatomy of Upper and Lower Limbs | 2 | C | 15 | 45 |
| BCH 201 | General Biochemistry I | 2 | C | 15 | 45 |



| | | | | | |
|---------|---------------------------------|-----------|---|----|---|
| ANA 203 | General and Systemic Embryology | 2 | C | 30 | - |
| PIO 305 | Neurophysiology I | 2 | C | 30 | - |
| | Total | 19 | | | |

300 Level

| Course code | Course Title | Unit(s) | Status | LH | PH |
|-------------|--|-----------|--------|----|-----|
| GST 312 | Peace and Conflict Resolution | 2 | C | 30 | - |
| ENT 312 | Venture Creation | 2 | C | 15 | 45 |
| PSY 313 | Psychology of the Hearing Impaired | 1 | C | 15 | - |
| COM 315 | Biostatistics | 2 | C | 30 | - |
| BCH 304 | Metabolism of Amino Acids & Proteins | 2 | C | 30 | - |
| AUD 320 | Paediatric Audiology | 1 | C | 15 | - |
| AUD 321 | Industrial Attachment (SIWES) Audiology Hospital Attachment | 6 | C | - | 270 |
| PST 311 | Programming for Rehabilitation | 1 | C | 15 | - |
| PHA 312 | Introductory Pharmacology | 1 | C | 15 | - |
| PST 313 | Introductory Pathology | 1 | C | 15 | - |
| NSC 314 | Clinical Nursing Procedure | 1 | C | 15 | - |
| AUD 311 | Introduction to Audiology | 1 | C | 15 | - |
| AUD 312 | Basic Procedures in Audiology | 1 | C | 15 | - |
| AUD 313 | Medical Conditions Amenable to Audiology | 1 | C | 15 | - |
| AUD 314 | Surgical Conditions Amenable to Audiology | 1 | C | 15 | - |
| | Total | 24 | | | |



400 Level (Clinical Year I)

| Course code | Course Title | Unit(s) | Status | LH | PH |
|--------------------|---|----------------|---------------|-----------|-----------|
| AUD 403 | Professionalism, Ethics & Administration in Audiology | 2 | C | 30 | - |
| AUD 404 | Phonetics and Linguistic in Audiology | 1 | C | 30 | - |
| AUD 407 | Introduction to Clinical Work in Audiology | 1 | C | 15 | - |
| AUD 409 | Aural Rehabilitation | 1 | C | 15 | - |
| AUD 410 | Obscure Auditory Disorder | 1 | C | 30 | - |
| AUD 412 | Noise and Auditory Conservation | 1 | C | 15 | - |
| AUD 414 | Basic Otorhinolaryngology | 1 | C | 15 | - |
| AUD 415 | Principles and Practice of Audiology | 1 | C | 15 | - |
| AUD 416 | Voice disorder and Management | 1 | C | 15 | - |
| AUD 417 | Hearing Impairment and Deafness | 1 | C | 15 | - |
| AUD 418 | Fluency Disorder and Management | 1 | C | 15 | - |
| AUD 419 | Research Methods in Medical Rehabilitation | 4 | C | 60 | - |
| | Total | 16 | - | | |

500 Level (Clinical Year II)

| Course code | Course Title | Unit(s) | Status | LH | PH |
|--------------------|---|----------------|---------------|-----------|-----------|
| AUD 503 | Community Audiology | 2 | C | 15 | 45 |
| AUD 505 | Counselling and Hearing Impairment | 2 | C | 15 | 45 |
| AUD 507 | Aging and Communication disorder | 1 | C | 15 | - |
| AUD 508 | Tinnitus, Vestibular Disorders and Rehabilitation | 2 | C | 15 | 45 |
| AUD 509 | Rehabilitation and Audiological Functional Training | 1 | C | 15 | 45 |
| AUD 510 | Clinical Work in Audiology | 2 | C | 15 | 45 |
| AUD 511 | Special Topic Seminar in Audiology | 2 | C | 30 | - |
| AUD 512 | Research Project | 4 | C | - | 180 |
| AUD 513 | Geriatric Audiology | 2 | C | 30 | - |
| | Total | 18 | | | |



Course Contents and Learning Outcomes

100 Level

GST 111: Communication in English I

(2 Units C: LH 15; PH 45)

Learning Outcomes

At the end of this course, students should be able to:

1. identify possible sound patterns in English Language;
2. list notable Language skills;
3. classify word formation processes;
4. construct simple and fairly complex sentences in English;
5. apply logical and critical reasoning skills for meaningful presentations;
6. demonstrate an appreciable level of the art of public speaking and listening; and
7. Write simple and technical reports.

Course Contents

Sound patterns in English Language (vowels and consonants, phonetics and phonology). English word classes (lexical and grammatical words, definitions, forms, functions, usages, collocations). Sentence in English (types: structural and functional, simple and complex). Grammar and Usage (tense, mood, modality and concord, aspects of language use in everyday life). Logical and Critical Thinking and Reasoning Methods (Logic and Syllogism, Inductive and Deductive Argument and Reasoning Methods, Analogy, Generalisation and Explanations). Ethical considerations, Copyright Rules and Infringements. Writing Activities: (Pre-writing , Writing, Post writing, Editing and Proofreading; Brainstorming, outlining, Paragraphing, Types of writing, Summary, Essays, Letter, Curriculum Vitae, Report writing, Note making and many others. Mechanics of writing). Comprehension Strategies: (Reading and types of Reading, Comprehension Skills, 3RsQ). Information and Communication Technology in modern Language Learning. Language skills for effective communication. Major word formation processes. Writing and reading comprehension strategies. Logical and critical reasoning for meaningful presentations. Art of public speaking and listening.

GST 112 Nigerian Peoples and Culture

(2 Units C: LH 30)

Learning Outcomes

At the end of the course, students should be able to:

1. analyse the historical foundation of the Nigerian culture and arts in pre-colonial time;
2. list and identify the major linguistic groups in Nigeria;
3. explain the gradual evolution of Nigeria as a political unit;
4. analyse the concepts of Trade, Economic and Self-reliance status of the Nigerian peoples towards national development;
5. enumerate the challenges of the Nigerian State towards Nation building;
6. analyse the role of the Judiciary in upholding people's fundamental rights;
7. identify acceptable norms and values of the major ethnic groups in Nigeria; and
8. list and suggest possible solutions to identifiable Nigerian environmental, moral and value problems.



Course Contents

Nigerian history, culture and art up to 1800 (Yoruba, Hausa and Igbo peoples and culture; peoples and culture of the ethnic minority groups). Nigeria under colonial rule (advent of colonial rule in Nigeria; Colonial administration of Nigeria). Evolution of Nigeria as a political unit (amalgamation of Nigeria in 1914; formation of political parties in Nigeria; Nationalist movement and struggle for independence). Nigeria and challenges of nation building (military intervention in Nigerian politics; Nigerian Civil War). Concept of trade and economics of self-reliance (indigenous trade and market system; indigenous apprenticeship system among Nigeria people; trade, skill acquisition and self-reliance). Social justices and national development (law definition and classification. Judiciary and fundamental rights. Individual, norms and values (basic Nigeria norms and values, patterns of citizenship acquisition; citizenship and civic responsibilities; indigenous languages, usage and development; negative attitudes and conducts. Cultism, kidnapping and other related social vices). Re-orientation, moral and national values (The 3R's – Reconstruction, Rehabilitation and Re-orientation; Re-orientation Strategies: Operation Feed the Nation (OFN), Green Revolution, Austerity Measures, War Against Indiscipline (WAI), War Against Indiscipline and Corruption(WAIC), Mass Mobilization for Self-Reliance, Social Justice and Economic Recovery (MAMSER), National Orientation Agency (NOA). Current socio-political and cultural developments in Nigeria.

BIO 101: General Principles of Biology

(2 Units C: LH 30)

Learning Outcomes

At the end of lectures in Plant Biology, students should be able to:

1. explain cells structure and organisations;
2. summarise functions of cellular organelles;
3. characterise living organisms and state their general reproduction;
4. describe the interrelationship that exists between organisms;
5. discuss the concept of heredity and evolution; and
6. enumerate habitat types and their characteristics.

Course Contents

Cell structure and organisation. functions of cellular organelles. characteristics and classification of living things. chromosomes, genes their relationships and importance. General reproduction. Interrelationships of organisms (competitions, parasitism, predation, symbiosis, commensalisms, mutualism, saprophytism). Heredity and evolution (introduction to Darwinism and Lamarckism, Mendelian laws, explanation of key genetic terms). Elements of ecology and types of habitat.

BIO: 102 General Principles of Biology II

(2 Units C: LH 30)

Learning Outcomes

At the end of the lectures in Introductory Ecology, students should be able to:

1. list the characteristics, methods of identification and classification of viruses, bacteria and fungi;
2. state the unique characteristics of plant and animal kingdoms;
3. describe ecological adaptations in the plant and animal kingdoms;
4. explain nutrition, respiration, excretion and reproduction in plants and animals; and
5. describe growth and development in plants and animals.



Course Contents

Basic characteristics, identification and classification of viruses, bacteria and fungi. A generalised survey of the plant and animal kingdoms based mainly on the study of similarities and differences in the external features. Ecological adaptations. Briefs on physiology to include nutrition, respiration, circulatory systems, excretion, reproduction, growth and development.

CHM 101: General Chemistry I

(2 Units C: LH 30)

Learning Outcomes

At the end of this course, students should be able to:

1. define atom, molecules and chemical reactions;
2. discuss the Modern electronic theory of atoms;
3. write electronic configurations of elements on the periodic table;
4. justify the trends of atomic radii, ionization energies, electronegativity of the elements based on their position in the periodic table;
5. identify and balance oxidation – reduction equation and solve redox titration problems;
6. illustrate shapes of simple molecules and hybridised orbitals;
7. identify the characteristics of acids, bases and salts, and solve problems based on their quantitative relationship;
8. apply the principles of equilibrium to aqueous systems using LeChatelier's principle to predict the effect of concentration, pressure and temperature changes on equilibrium mixtures;
9. analyse and perform calculations with the thermodynamic functions, enthalpy, entropy and free energy; and
10. determine rates of reactions and its dependence on concentration, time and temperature.

Course Contents

Atoms, molecules and chemical reaction. Chemical equation and stoichiometry. Atomic structure and periodicity. Modern electronic theory of atoms. Radioactivity. Chemical bonding. Properties of gases. Equilibria and Thermodynamics. Chemical Kinetic. Electrochemistry.

CHM 102: General Chemistry II

(2 Units C: LH 30)

Learning Outcomes

At the end of this course, students should be able to:

1. state the importance and development of organic chemistry;
2. define fullerenes and its applications;
3. discuss electronic theory;
4. determine the qualitative and quantitative of structures in organic chemistry;
5. describe rules guiding nomenclature and functional group classes of organic chemistry;
6. determine rate of reaction to predict mechanisms of reaction;
7. identify classes of organic functional group with brief description of their chemistry;
8. discuss comparative chemistry of group 1A, IIA and IVA elements; and
9. describe basic properties of Transition metals.



Course Contents

Historical survey of the development and importance of Organic Chemistry. Fullerenes as fourth allotrope of carbon, uses as nanotubules, nanostructures, nanochemistry. Electronic theory in organic chemistry. Isolation and purification of organic compounds. Determination of structures of organic compounds including qualitative and quantitative analysis in organic chemistry. Nomenclature and functional group classes of organic compounds. Introductory reaction mechanism and kinetics. Stereochemistry. The chemistry of alkanes, alkenes, alkynes, alcohols, ethers, amines, alkyl halides, nitriles, aldehydes, ketones, carboxylic acids and derivatives. The Chemistry of selected metals and non-metals. Comparative chemistry of group IA, IIA and IVA elements. Introduction to transition metal chemistry.

CHM107: Practical Chemistry I

(1 Unit C: PH 45)

Learning Outcomes

At the end of the course, students should be able to:

1. describe the general laboratory rules and safety procedures;
2. collect scientific data and correctly carrying out Chemical experiments;
3. identify the basic glassware and equipment in the laboratory;
4. identify the differences between primary and secondary standards;
5. perform redox titration;
6. recording observations and measurements in the laboratory notebooks; and
7. analyse the data to arrive at scientific conclusions.

Course Contents

Laboratory experiments designed to reflect topics presented in courses CHM 101 and CHM 102. These include acid-base titrations, qualitative analysis, redox reactions, gravimetric analysis, data analysis and presentation.

CHM 108: General Chemistry Practical II

(1 Unit C: PH 45)

Learning Outcomes

At the end of this course, the students should be able to:

1. identify the general laboratory rules and safety procedures;
2. collect scientific data and correctly carrying out Chemical experiments;
3. identify the basic glassware and equipment in the laboratory;
4. identify and carry out preliminary tests which includes ignition, boiling point, melting point, test on known and unknown organic compounds;
5. perform solubility tests on known and unknown organic compounds;
6. conduct elemental tests on known and unknown compounds; and
7. conduct functional group/confirmatory test on known and unknown compounds which could be acidic / basic / neutral organic compounds.

Course Contents

Continuation of CHM 107. Additional laboratory experiments to include functional group analysis, quantitative analysis using volumetric methods.



MTH 101: Elementary Mathematics (Algebra and Trigonometry) (2 Units C: LH 30)

Learning Outcomes

At the end of the course students should be able to:

1. explain basic definition of Set, Subset, Union, Intersection, Complements and use of Venn diagrams;
2. solve quadratic equations;
3. solve trigonometric functions;
4. identify various types of numbers; and
5. solve some problems using Binomial theorem.

Course Contents

Elementary set theory; subset, union, intersection, complements, venn diagrams. Real numbers; Integers, Rational and Irrational numbers, mathematical, induction, Sequences and Series, Theory of Quadratic equations, Binomial theorem. Complex numbers; Algebra of complex numbers; the Argand Diagram. De-Moivre's theorem, nth roots of unity, Circular measure, Trigonometric functions of angles of any magnitude, addition and factor formulae.

MTH 102: Elementary Mathematics II (Calculus) (2 Units C: LH 30)

Learning Outcomes

At the end of the course, students should be able to:

1. identify types of rules in Differentiation and Integration;
2. explain the meaning of Function of a real variable, graphs, limits and continuity; and
3. solve some applications of definite integrals in areas and volumes.

Course Contents

Calculus: Function of a real variable, graph, limits and idea of continuity. The derivative as limit of rate of change. Techniques of differentiation. Extreme curve sketching; Integration as an inverse of differentiation. Methods of integration, definite integrals. Application to areas and volumes.

PHY 101: General Physics I (Mechanics) (2 Units C: LH 30)

Learning Outcomes

At the end of the course, the student should be able to;

1. identify and deduce the physical quantities and their units;
2. differentiate between vectors and scalars;
3. describe and evaluate motion of systems on the basis of the fundamental laws of mechanics;
4. apply Newton's laws to describe and solve simple problems of motion;
5. evaluate work, energy, velocity, momentum, acceleration, and torque of moving or rotating objects;
6. explain and apply the principles of conservation of energy, linear and angular momentum;
7. describe the laws governing motion under gravity; and
8. explain motion under gravity and quantitatively determine behaviour of objects moving under gravity.

Course Contents



Space and time. Units and dimension, Vectors and Scalars. Differentiation of vectors: displacement, velocity and acceleration. Kinematics. Newton laws of motion (Inertial frames, Impulse, force and action at a distance, momentum conservation). Relative motion. Application of Newtonian mechanics. Equations of motion. Conservation principles in physics. Conservative forces. Conservation of linear momentum. Kinetic energy and work. Potential energy. System of particles. Centre of mass. Rotational motion: Torque, vector product, moment, rotation of coordinate axes and angular momentum. Polar coordinates. Conservation of angular momentum. Circular motion. Moments of inertia. gyroscopes and precession. Gravitation: Newton's Law of Gravitation. Kepler's Laws of Planetary Motion. Gravitational Potential Energy. Escape velocity. Satellites motion and orbits.

PHY 102: General Physics II (Electricity & Magnetism)

(2 Units C: LH 30)

Learning Outcomes

At the end of this course, the student should be able to:

1. describe the electric field and potential, and related concepts, for stationary charges;
2. calculate electrostatic properties of simple charge distributions using Coulomb's law, Gauss's law and electric potential;
3. describe and determine the magnetic field for steady and moving charges;
4. determine the magnetic properties of simple current distributions using Biot-Savart and Ampere's law;
5. describe electromagnetic induction and related concepts, and make calculations using Faraday and Lenz's laws;
6. explain the basic physical of Maxwell's equations in integral form;
7. evaluate DC circuits to determine the electrical parameters; and
8. determine the characteristics of ac voltages and currents in resistors, capacitors, and Inductors.

Course Contents

Forces in nature. Electrostatics; electric charge and its properties, methods of charging. Coulomb's law and superposition. electric field and potential. Gauss's law. Capacitance. Electric dipoles. Energy in electric fields. Conductors and insulators, current, voltage and resistance. Ohm's law and analysis of DC circuits. Magnetic fields. Lorentz force. Biot-Savart and Ampère's laws. magnetic dipoles. Dielectrics. Energy in magnetic fields. Electromotive force. Electromagnetic induction. Self and mutual inductances. Faraday and Lenz's laws. Step up and step-down transformers: Maxwell's equations. Electromagnetic oscillations and waves. AC voltages and currents applied to inductors, capacitors, resistance, and combinations.

PHY 107: General Experimental Physics I

(1 Unit C: PH 45)

Learning Outcomes

At the end of this course, the student should be able to;

1. conduct measurements of some physical quantities;
2. make observations of events, collect and tabulate data;
3. identify and evaluate some common experimental errors;
4. plot and analyse graphs; and
5. draw conclusions from numerical and graphical analysis of data.



Course Contents

This introductory course emphasises quantitative measurements, the treatment of measurement errors and graphical analysis. A variety of experimental techniques should be employed. The experiments include studies of meters, the oscilloscope, mechanical systems, electrical and mechanical resonant systems, light, heat, viscosity etc., covered in PHY 101 and PHY 102. However, emphasis should be placed on the basic physical techniques for observation, measurements, data collection, analysis and deduction.

PHY 108: General Practical Physics II

(1 Unit C: PH 45)

Learning Outcomes

At the end of this course, the student should be able to:

1. conduct measurements of some physical quantities;
2. make observations of events, collect and tabulate data;
3. identify and evaluate some common experimental errors;
4. plot and analyse graphs;
5. draw conclusions from numerical and graphical analysis of data; and
6. prepare and present practical reports.

Course Contents

This practical course is a continuation of PHY 107 and is intended to be taught during the second semester of the 100 level to cover the practical aspect of the theoretical courses that have been covered with emphasis on quantitative measurements. The treatment of measurement errors, and graphical analysis. However, emphasis should be placed on the basic physical techniques for observation, measurements, data collection, analysis and deduction.

PSY 101: Psychology of Child Development

(1 Unit C: LH 15)

Learning Outcomes

At the end of this course student will be able to:

1. explain the process of child development from neonate to children.
2. list the importance of babies' growth chart and its relevance to audiological practice.
3. explain the importance of prematurity and other growth retardation to hearing function.
4. list out all the different exceptional conditions (disabilities) in children and how the impact hearing and communication in general;
5. list out the conditions that constitutes 'At Risk Register; and
6. demonstrate the audiological rehabilitation techniques of children with exceptional conditions.

Course Contents

General knowledge of fetal growth and development. Growth and development of the premature child. Physical growth in the neonate and childhood. Growth monitoring and value of growth charts. Physical, mental and emotional developmental assessment. Exceptional conditions in children (disabilities and giftedness). At risk register babies for audiological intervention.



200 Level

GST 212 Philosophy, Logic and Human Existence

(2 Units C: LH 30)

Learning Outcomes

At the end of this course, the student should be able to:

1. enumerate the basic features of philosophy as an academic discipline;
2. identify the main branches of philosophy & the centrality of logic in philosophical discourse;
3. describe the elementary rules of reasoning;
4. distinguish between valid and invalid arguments;
5. think critically and assess arguments in texts, conversations and day-to-day discussions;
6. critically assess the rationality or otherwise of human conduct under different existential conditions;
7. develop the capacity to extrapolate and deploy expertise in logic to other areas of knowledge; and
8. guide his or her actions, using the knowledge and expertise acquired in philosophy and logic.

Course Contents

Scope of philosophy; notions, meanings, branches and problems of philosophy. Logic as an indispensable tool of philosophy. Elements of syllogism, symbolic logic— the first nine rules of inference. Informal fallacies, laws of thought, nature of arguments. Valid and invalid arguments, logic of form and logic of content — deduction, induction and inferences. Creative and critical thinking. Impact of philosophy on human existence. Philosophy and politics, philosophy and human conduct, philosophy and religion, philosophy and human values, philosophy and character molding and many others.

ENT 211 Entrepreneurship and Innovation

(2 Units C: LH 15; PH 45)

Learning Outcomes

At the end of this course, students should be able to:

1. explain the concepts and theories of entrepreneurship, intrapreneurship, opportunity seeking, new value creation, and risk taking;
2. state the characteristics of an entrepreneur;
3. analyse the importance of micro and small businesses in wealth creation, employment, and financial independence;
4. engage in entrepreneurial thinking;
5. identify key elements in innovation;
6. describe stages in enterprise formation, partnership and networking including business planning;
7. describe contemporary entrepreneurial issues in Nigeria, Africa and the rest of the world; and
8. state the basic principles of e-commerce.



Course Contents

Concept of Entrepreneurship (Entrepreneurship, Intrapreneurship/Corporate Entrepreneurship,). Theories, rationale and relevance of Entrepreneurship (Schumpeterian and other perspectives, risk-taking, necessity and opportunity-based entrepreneurship and Creative destruction). Characteristics of Entrepreneurs (opportunity seeker, risk taker, natural and nurtured, problem solver and change agent, innovator and creative thinker). Entrepreneurial thinking (critical thinking, reflective thinking, and creative thinking). Innovation (Concept of innovation, dimensions of in knowledge and innovation). Enterprise formation, partnership and networking (basics of business plan, forms of business ownership, business registration and forming alliances and joint ventures). Contemporary Entrepreneurship issues (knowledge, skills and technology, intellectual property, virtual office, networking). Entrepreneurship in Nigeria (biography of inspirational entrepreneurs, youth and women entrepreneurship, entrepreneurship support institutions, youth enterprise networks and environmental and cultural barriers to entrepreneurship). Basic principles of e-commerce.

ANA 201: Anatomy of Upper and Lower Limbs

(2 Units C: LH 15; PH 45)

Learning Outcomes

At the end of the course, students should be able to:

1. define fundamental anatomical terminology and discuss the anatomical position;
2. describe the anatomy of the musculoskeletal system, including the axial skeleton; appendicular skeleton, appendicular and axial muscles, and arthrology;
3. describe the general features of the bones of the upper and lower limbs;
4. identify the major muscles of the upper and lower limbs;
5. explain the types and structure of the joints of the upper and lower limbs;
6. correlate between the attachment of the muscles and their functions on the different joints;
7. identify the major nerves of the upper and lower limbs;
8. describe the functional components of each of the major nerves and its distribution;
9. identify and describe the course of the major superficial veins of the upper and lower limbs; and
10. name the major arteries of the upper and lower limbs.

Course Contents

Descriptive terms, planes and terms of relationship of the human body, terms of comparison, attachment of muscles, types of muscles, movements of joints. Osteology, principles of kinesiology, general organisation of body system. Cutaneous innervation of the upper limb; pectoral region; breast; axilla; shoulder region; arm and cubital fossa; flexor compartment of forearm; extensor compartment of forearm; hand; venous and lymphatic drainage of the upper limb. Applied anatomy of nerves; blood supply of the upper limb. Cutaneous innervation of the lower limb; femoral triangle; adductor canal and medial side of the thigh; gluteal region; back of the thigh, popliteal fossa; extensor compartment of the leg and dorsum of the foot; peroneal and flexor compartment of the leg; sole of the foot, arches of the foot; mechanism of walking; venous and lymphatic drainage of the lower limb; applied anatomy of the nerves and blood supply to the lower limb.



BCH 201: General Biochemistry

(2 Units C: LH 30)

Learning Outcomes

At the end of the course, students should be able to:

1. describe the structure of different macromolecules in biological system;
2. identify types of chemical reactions involving these macromolecules;
3. explain the various methods of isolation of these macromolecules;
4. estimate the effects of acids and alkalis on the macromolecules.;
5. describe purification of macromolecules; and
6. discuss quantification of various macromolecules.

Course Contents

Introductory chemistry of amino acids; their properties, reactions and biological functions. Classification of amino acids: neutral, basic and acidic; polar and non-polar; essential and non-essential amino acids. Peptides. Introductory chemistry and classification of proteins. Biological functions of proteins. Methods of their isolation, purification and identification. Primary, secondary, tertiary and quaternary structures of proteins. Basic principles of tests for proteins and amino acids. Introductory chemistry of carbohydrates, lipids and nucleic acids. Nomenclature of nucleosides, and nucleotides; effects of acid and alkali on hydrolysis of nucleic acids.

PIO 201: Introductory Physiology & Blood

(2 Units C: LH 30)

Learning Outcomes

At the end of the course, students should be able to:

1. describe the composition of a cell membrane;
2. explain how a potential difference across a membrane will influence the distribution of a cation and an anion;
3. describe how transport rates of certain molecules and ions are accelerated by specific membrane transport proteins;
4. distinguish between active (primary and secondary) transport, facilitated diffusion, and passive diffusion based on energy source and carrier protein involvement;
5. identify the mechanisms and role of selective transporters for amino acids, neurotransmitters, nutrients, etc.;
6. explain the general concepts of homeostasis and the principles of positive and negative feedback in physiological systems;
7. identify the site of erythropoietin production, the stimulus for its release, and the target tissue for erythropoietin action;
8. discuss the normal balance of red blood cell synthesis and destruction, including how imbalances in each lead to anemia or polycythemia;
9. list and differentiate the various types of leukocytes;
10. describe the role of thrombocytes in haemostasis; and
11. list clotting factors and the discuss the mechanism of anti-coagulants.



Course Contents

Introduction and history of physiology. Structure and functions of cell membranes. Transport process. Special transport mechanism in amphibian bladder, kidney, gall bladder, intestine, astrocytes and exocrine glands. Biophysical principles. Homeostasis and control systems including temperature regulation. Biological rhythms. Composition and functions of blood. Haemopoiesis. WBC and differential count. Plasma proteins Coagulation, fibrinolysis and platelet functions. Blood groups –ABO system – Rh system. Blood transfusion – indication for collection and storage of blood, hazards of blood transfusions. Reticulo- endothelial system. Immunity and immunodeficiency disease and HIV.

PHA 201: General Pharmacology

(1 Unit C: LH 15)

Learning Outcomes

At the end of the course, students should be able to:

1. explain the history of pharmacology;
2. demonstrate understanding of drug interaction in the human body system;
3. explain the effects of disease on drug kinetics;
4. demonstrate understanding of relationship between drug and aging;
5. explain the effect of drugs in pregnancy;
6. explain common allergic reactions to different drugs; and
7. explain common medications used for different diseases or ill conditions.

Course Contents

History of Pharmacology and its development. Introduction to pharmacokinetics; drug absorption and bioavailability. Drug metabolism, pharmaco-genetics. Effects of disease on drug kinetics. Drug in pregnancy and the extreme age. Pharmacodynamics; dose-response relationships, LD_{50} ED_{50} and TD_{50} . Therapeutic index; introduction of new drugs, clinical trials; adverse drug reactions and adverse reaction surveillance. Routes of drug administration. Basic principles of pharmacokinetics. Absorption, distribution and biotransformation of drugs. Drug reception interactions. Non-Steroidal Anti Inflammatory Drugs (NSAID). Muscle relaxants, sedatives and analgesic agents. Anti-hypertensive drugs. Bronchodilators and many others.

PST 201: Rehabilitation Physics/Biophysics

(1 Unit C: LH 15)

Learning Outcomes

At the end of the course, students should be able to:

1. describe basic principles of physics used in electromedical equipment in all rehabilitation specialties;
2. define laws of physics and various aspect of physical phenomena and their interaction with human body as applied to all rehabilitation specialties;
3. describe basic concepts of electricity, its laws, magnetism, electro mechanics and related theories in all rehabilitation specialties;
4. explain fundamentals of low, medium and high frequency currents, heat, electromagnetic radiations and sound waves as applied to all rehabilitation specialties; and
5. demonstrate safety skills in biomedical instruments and radiation protection.



Course Contents

Structure of matter, property of matter, energy and its transformation. Energy and its definitions, mechanical energy, conductor-insulator. Static electricity, condensers, current electricity, conduction of electricity through electrolytes. Conduction in semi-conductors. Magnetic energy. Production of electricity. Principles and application of E.M.F. to Choke coil, transformer Regulation of induced currents. Physics of sound, perceptual and productive processes of speech, basic instrumentation, and the interrelationships of these areas to communication. Fundamentals, concepts and theories of acoustics, speech signal and perception. Rectification of A/C; Thermal energy; Transmission of heat; Conduction, Convection and Radiation Electromagnetic waves, Radiant energy; Grothus law; Cosine law; Inverse square law; Sonic energy; nature and properties of sound wave. Nature, effects and principles of production of direct current, muscle stimulating currents; modification of currents; Reverse, interrupt, surge mechanical, manual electronic multi vibration circuit. High frequency current basic circuit. The physics of quantum medicine.

PST 202: Introduction to Medical Rehabilitation

(1 Unit C: LH 15)

Learning Outcomes

At the end of the course, students should be able to:

1. explain the scope of his/her discipline and ethical responsibility attached to the discipline as well as history of the practice of medical rehabilitation locally and globally;
2. describe the importance and role of family input in the process of rehabilitation or healing of the patient;
3. list out the laws and regulations surrounding medical rehabilitation practice; and
4. apply the technique of using all other existing modalities for communication with the patient.

Course Contents

History, ethical orientation and scope of practice of medical rehabilitation professions. Roles of medical rehabilitation in preventive, promotive, curative and rehabilitative care. Importance of patients in health care, and patient's family in treatment. Responsibilities of the clinician and the patient. Student/patient relationship. Respect and confidentiality Patient care communication – Professional conduct and ethical practice. Teamwork. Listening and interviewing skills. Use and interpretation of verbal and nonverbal communication. Emotional responses to, and strategies for managing patient's behavior and patient's safety. Medical laws and regulations.

MCB 204: Introduction to Microbiology & Infection Control

(2 Units C: LH 30)

Learning Outcomes

At the end of the course, students should be able to:

1. describe common disease causing microorganisms and their various classifications;
2. explain various types of infections-fungal, bacterial, viral and parasitic;
3. explain the role of bacterial pathogenesis;
4. identify the role of acquired and innate immune systems at preventing infections;
5. explain how infections causes diseases and break through body's immune system;
6. demonstrate infection control practices in clinics/wards;
7. demonstrate skills in standard precautions such as wearing of infection prevention gowns, lab coats, hand gloves, nose masks and many others;
8. explain the chain of infections and how to create a sterile environment in the clinic;
9. explain various ways of safe interaction with patients with transmissible diseases; and



10. demonstrate skills and knowledge of sterilizing clinical equipment on a daily or regular basis.

Course Contents

Scope of microbiology, historical approach to infections and its control, classifications and nomenclature of microorganisms. Introduction to the microbial world, Introduction to bacteriology, mycology, virology and parasitology (the protozoans); Disinfection and sterilisation; Nature and acquired resistance to infection; determination of innate immunity; deep/superficial tissue infections; fungal infections: deep and systemic mycosis, perichondral/cartilaginous/osseous infections; hospital associated infections.

ANA 203 General and Systemic Embryology

(2 Units C: LH 30)

Learning Outcomes

At the end of the course, students should be able to:

1. explain how the embryo is form from the zygote;
2. discuss the role of cleavage and gastrulation in animal development;
3. demonstrate; understanding of embryology and significance of prenatal diagnostic methods;
4. describe structural features of primordia in tissue and organs at different developmental stages;
5. define risk periods in histo- and organogenesis; and
6. analyse the most often observed developmental anomalies.

Course Contents

Spermatogenesis, oogenesis; ovarian follicles; ovulation; corpus luteum; menstruation; uterine cycle; hormonal control of uterine cycle; fertilisation; cleavage; implantation; reproductive technologies-IVF/surrogacy/embryo transfer; embryo manipulation & potency/twinning; molecular embryology and transgenesis; gastrulation; notochord, neurulation; derivatives of the germ layers; folding of the embryo; fetal membranes; placenta; development of limbs and teratology. Growth and perinatology; congenital malformations – general introduction. The cardiovascular system, skin, structure of the nails and hair. Macrophagic system; cellular immunology; lymphoid organs; glands – endocrine and exocrine. Respiratory system. Digestive system. Urinary and genital systems. Electron micrograph studies of each organ.

PIO 305: Neurophysiology I

(2 Units C: LH 30)

Learning Outcomes

At the end of the course, students should be able to:

1. explain how inhibitory and excitatory post-synaptic potentials can alter synaptic transmission;
2. list the major receptor classifications and representative receptor agonists;
3. describe the cutaneous and proprioceptive mechanoreceptors and their function;
4. describe formation and reabsorption of cerebral spinal fluid (CSF), including the anatomy and function of the choroid plexus;
5. compare and Contrast the barrier mechanisms between the blood brain barrier and the blood CSF barrier and the consequences of barrier break down;
6. describe the major areas of the cerebral cortex and their roles in perception and motor coordination. Identify the Brodmann areas for visual, auditory, somatosensory, motor, and speech areas;



7. discuss the pathways for Pain/Temperature/Coarse Touch System and its connections to the cerebral cortex;
8. list the neural components of the Dorsal Column-Medial Lemniscus system and its Trigeminal analogues;
9. describe the functions of the medial and lateral motor pathways. Trace their origins and terminations within the spinal cord;
10. describe the physiologic-anatomy of the major ascending tracts (anterolateral and dorsal column-medial lemniscus systems) and descending spinal cord tract (cortico-spinal tract, CST), including crossing of midline;
11. list the functions of the following brainstem reflexes: cardiovascular baroreceptor, respiratory stretch receptor, cough reflex, pupillary light reflex, gag reflex, and blink reflex;
12. explain the role of the brain stem reticular formation in pain perception and modulation, level of consciousness, integration of brainstem reflexes, and the location of noradrenergic, serotonergic, and dopaminergic nuclei;
13. list the physiological functions of the Hypothalamus;
14. list the three functional divisions of the cerebellum, detailing the input and output connections of each, describe how these areas are integrated with the lateral and medial motor pathways;
15. discuss the overall functions of the basal ganglia in the initiation and control of movement;
16. describe how the amygdala interacts with the cerebral cortex to produce cognitive emotional behaviours;
17. describe the three states of human brain activity based on EEG, EOG and EMG recordings; and
18. distinguish the major characteristics of the major seizure disorders: Grand mal, Absence seizure (Petite mal), simple partial and complex partial seizures, and status epilepticus.

Course Contents

Organisation of the CNS and CNS control systems. Nerve generation and conduction of impulses. Synapses and synaptic transmission. Peripheral nervous system -the reflex arc and general properties of reflexes. Receptors. Spinal reflexes. Excitation and Inhibition. Localisation of functions in the cortex. Motor system. Pyramidal and extrapyramidal sensory systems. Reticular formation. Cerebellum: Control of posture. Neurobiology rhythms. Sleep and unconscious states. Memory, learning. Physiology of Special Senses: Eye: retina, sight, accommodation. Photochemical mechanism. Receptor potential. Light reflexes and adaptation. Ear: sound waves, hearing. Taste. Smell.



300 Level

GST 312 Peace and Conflict Resolution

(2 Units C: LH 30)

Learning Outcomes

At the end of the course, students should be able to:

1. analyse the concepts of peace, conflict and security;
2. list major forms, types and root causes of conflict and violence;
3. differentiate between conflict and terrorism.;
4. enumerate security and peace building strategies; and
5. describe roles of international organisations, media and traditional institutions in peace building.

Course Contents

Concepts of Peace, Conflict and Security in a multi-ethnic nation. Types and Theories of Conflicts: Ethnic, Religious, Economic, Geo-political Conflicts; Structural Conflict Theory, Realist Theory of Conflict, Frustration-Aggression Conflict Theory. Root causes of Conflict and Violence in Africa: Indigene and settlers Phenomenon; Boundaries/boarder disputes; Political disputes; Ethnic disputes and rivalries; Economic Inequalities; Social disputes; Nationalist Movements and Agitations; Selected Conflict Case Studies – Tiv-Junkun; Zango Kartaf, Chieftaincy and Land disputes and many others. Peace Building, Management of Conflicts and Security: Peace & Human Development. Approaches to Peace & Conflict Management --- (Religious, Government, Community Leaders and many others.). Elements of Peace Studies and Conflict Resolution: Conflict dynamics assessment Scales: Constructive & Destructive. Justice and Legal framework: Concepts of Social Justice; The Nigeria Legal System. Insurgency and Terrorism. Peace Mediation and Peace Keeping. Peace & Security Council (International, National and Local levels) Agents of Conflict resolution – Conventions, Treaties Community Policing: Evolution and Imperatives. Alternative Dispute Resolution, ADR. Dialogue b). Arbitration, c). Negotiation d). Collaboration and many others. Roles of International Organisations in Conflict Resolution. (a). The United Nations, UN and its Conflict Resolution Organs. (b). The African Union & Peace Security Council (c). ECOWAS in Peace Keeping. Media and Traditional Institutions in Peace Building. Managing Post-Conflict Situations/Crisis: Refugees. Internally Displaced Persons, IDPs. The role of NGOs in Post-Conflict Situations/Crisis.

ENT 312 Venture Creation

(2 Units C: LH 15; PH 45)

Learning Outcomes

At the end of this course, students, through case study and practical approaches, should be able to:

1. describe the key steps in venture creation;
2. spot opportunities in problems and in high potential sectors regardless of geographical location;
3. state how original products, ideas, and concepts are developed.;
4. develop business concept for further incubation or pitching for funding;
5. identify key sources of entrepreneurial finance;
6. implement the requirements for establishing and managing micro and small enterprises;
7. conduct entrepreneurial marketing and e-commerce;
8. apply a wide variety of emerging technological solutions to entrepreneurship; and



9. appreciate why ventures fail due to lack of planning and poor implementation.

Course Contents

Opportunity Identification (Sources of business opportunities in Nigeria, Environmental scanning, Demand and supply gap/unmet needs/market gaps/Market Research, Unutilised resources, Social and climate conditions and Technology adoption gap). New business development (business planning, market research). Entrepreneurial Finance (Venture capital, Equity finance, Micro finance, Personal savings, Small business investment organisations and Business plan competition). Entrepreneurial marketing and e-commerce (Principles of marketing, Customer Acquisition & Retention, B2B, C2C and B2C models of e-commerce, First Mover Advantage, E-commerce business models and Successful E-Commerce Companies,). Small Business Management/Family Business: Leadership & Management, Basic book keeping, Nature of family business and Family Business Growth Model. Negotiation and Business communication (Strategy and tactics of negotiation/bargaining, Traditional and modern business communication methods). Opportunity Discovery Demonstrations (Business idea generation presentations, Business idea Contest, Brainstorming sessions, Idea pitching). Technological Solutions (The Concept of Market/Customer Solution, Customer Solution and Emerging Technologies, Business Applications of New Technologies - *Artificial Intelligence (AI)*, *Virtual/Mixed Reality (VR)*, *Internet of Things (IoTs)*, *Blockchain*, *Cloud Computing*, *Renewable Energy* and many others. Digital Business and E-Commerce Strategies).

BCH 304: Metabolism of Amino Acid and Protein

(2 Units C: LH 30)

Learning Outcome

At the end of the course, students should be able to:

1. illustrate why and how proteins are broken in cellular systems;
2. explain how to determine the molecular weight of proteins;
3. recognise the relationship between the urea cycle and other pathways of protein metabolism;
4. describe the differences between ketogenic and glucogenic amino acids; and
5. identify the role of inorganic nitrogen in protein synthesis and breakdown.

Course Contents

Amino acids as building blocks of proteins and the peptide bond as covalent backbone of proteins. Forces involved in the stabilisation of protein structure. Protein isolation, fractionation, purification and characterisation. Amino acid analysis of peptides and proteins. Methods for the determination of the sequence of amino acids in proteins. Protein biosynthesis, molecular weight determination of proteins. Techniques in protein biochemistry. Oxidative degradation of amino acids and metabolism of one carbon units. Ammonia toxicity and urea formation. Ketogenic and glucogenic amino acids. Biosynthesis of amino acids and some derivatives, the urea cycle; metabolism of inorganic nitrogen. Disorders of amino acid metabolism and polyamines.



COM 315: Biostatistics

(2 Units C: LH 30)

Learning Outcomes

At the end of the course, students should be able to:

1. design a research proposal;
2. review and critique research papers in journals;
3. develop a research question, and identify appropriate designs to address research aims and objectives;
4. apply the knowledge of data collection and analysis;
5. draw up questionnaires and scientifically apply such questionnaires;
6. explain different statistical methods and their applicability to different research proposals;
7. list ethical rules that governs conduct of research; and
8. explain the process of conducting and publishing a research paper in a peer-review, high impact factor journal.

Course Contents

Research topic. Sampling techniques. Design of questionnaires Data gathering. Hypothesis formulation. Probability distribution. Normal Poisson and Binomial distribution Mean. Standard error. Standard deviation. Curve fitting. Chi-square test. Student T test. F-distribution. Regression. Correlation. Quantitative and Qualitative research models. Advanced statistical analysis.

PHT 313: Psychology of the Hearing Impaired

(1 Unit C: LH 15)

Learning Outcomes

At the end of the course, students should be able to:

1. identify the difference between growth and development;
2. differentiate between the growth pattern in children, especially, normal and handicapped children;
3. identify differences in reaction of parents to a handicapped/hearing impaired child;
4. explain the difference in psychology of a congenitally deaf and acquired or a deafened individual;
5. list the different stages of psychological reaction by parents and siblings to the arrival of a baby with a hearing disorder;
6. apply knowledge of counselling already garnered in the course to manage or alleviate parental concern of a hearing impaired child in the family;
7. list the challenges faced by the hearing impaired in the society and how to ameliorate it;
8. explain deaf culture and its implications for oto-audiological treatments across the globe;
9. explain the difference between the psychology of the hearing and the hearing impaired;
10. explain the difference between the psychology of the deaf and the deafened;
11. explain the psychology of the society in general toward the hearing impaired;
12. demonstrate counselling ability to the hearing impaired and the family;
13. explain the psychology behind resistance towards the use of hearing assistive devices particularly in young adolescents/adults; and
14. explain the gender difference in psychology of the hearing impaired.



Course Contents

Developmental process in a normal hearing child from psychological perspective. Process of physical, mental, emotional, linguistic development of a child as related to auditory development. Psychological reaction to sound and type of sound a baby reacts to. Personality characteristics of the hearing impaired child. Parental reaction to diagnosis of hearing loss in their offspring. Psychology of congenital (pre-lingual) and acquired (post-lingual) hearing loss. Deaf culture/community. Communication strategies in the profoundly hearing impaired. Psychological approach to education of the hearing impaired child. Perception of the deaf to cochlea implants and other oto-audiological treatments.

AUD 320: Paediatric Audiology

(1 Unit C: LH 15)

Learning Outcomes

At the end of the course, students should be able to:

1. outline the role of an audiologist and other health professionals in paediatric health care;
2. describe the development of speech, language and auditory skills in relation to physical milestone development;
3. identify various types of etiologies associated with hearing loss in the paediatric population;
4. discuss the nature and statistical figure of hearing loss in children both globally and nationally;
5. list the relevant tests battery for assessment of hearing in neonates and children;
6. explain both peripheral and central hearing disorders in children;
7. explain the implications of hearing loss in children on educational, social and psychological development;
8. interpret behavioural and non-behavioural paediatric tests; and
9. demonstrate the protocol for rehabilitation of children with hearing loss.

Course Contents

Epidemiology of childhood hearing loss, local and global. Auditory disorders in children. Genetic hearing loss. Otologic evaluation and management of hearing loss in children. New born hearing screening. Behavioural hearing tests in paediatric population. Objective hearing tests in children. Immitance (middle ear assessment) in children. Auditory processing disorders in children. Educational, social, linguistic and psychological implications of hearing disorders in children.

AUD 321: Clinical Externship Scheme (SIWES)

(6 Units C: PH 270)

Students in their 3rd and 4th year will partake in the students Industrial Work Experience (SIWES) of the NUC as clinical externship scheme for a period of 12 weeks during the long vacation in accredited hospitals. Students will be expected to complete a logbook, which will be rated by the supervising. Clinician at the end of the scheme. The grading will be 10% of the in-course mark for the succeeding year.

Learning Outcomes

At the end of the course, students should be able to:

1. demonstrate professional behaviour;
2. perform clinical assessment of different types of populations;
3. implement interventions for different diagnoses under the supervision of a qualified audiologist;
4. implement rehabilitation for different categories of patients;



5. list out plan for follow-up cases;
6. explain referral protocol for patients who need to be referred to other professionals;
7. document own clinical experiences on the field;
8. accurately and appropriately diagnose a range of audiological cases presented to him/her by the clinical supervisor;
9. explain audiological findings;
10. counsel patients under the supervision of a qualified and clinically certified audiologist;
11. explain report writing, booking of appointment, and other non-clinical activities associated with the job; and
12. explain the administrative set up of the clinic.

Course Contents

Professionalism in audiology. Audiological assessment-paediatric, adults and the elderly/aged. Battery of tests in audiology. Audiological Diagnosis. Referrals in audiology. Audiological treatment/(re)habilitation. Audiology clinic administrative set up.

PST 311: Programming for Rehabilitation

(1 Unit C: LH 15)

Learning Outcomes

At the end of the course, students should be able to:

1. explain basics of computer programming;
2. define programming;
3. explain the history behind computer programming;
4. explain the use and importance of computer programming as applied to rehabilitation; and
5. list steps of 2D and 3D computer aided designing method.

Course Contents

Basics of CAD: Introduction, Definition, History, Current status, Product Cycle, Automation, Designing, Application and Benefits. Computer Graphics: Introduction of software, Function of graphic package, Application Software. AutoCad 2010 and updated version: Introduction, Foundation of AutoCad Commands, Execution of Simple 2D Drawings, Understanding 3D commands, Executing 3D Commands, Creating 3D objects, Rendering and Image attach to an object Starting New Projects, Creating, Editing, Saving Drawing, Annotation, Dimension, Plotting, Customisation, Auto Lisp. Introduction to CNC, History of CNC, Advantages and disadvantages of N/C, CNC, DNC, Major part of CNC. Basics of CAM: Introduction of CNC machine, basics of Computer Aided Designing and Manufacturing (CAD/CAM) and its use in P&O. Other kinds of Computer use in Prosthetics and Orthotics. CAD/CAM Technology in socket making and also making of different kinds of orthosis and prosthesis. CAD/CAM in Prosthetics & Orthotics: types of digitisers used, concept of different types of modifying software, CNC carver and its specification, step wise fabrication procedure of sockets, shells and spinal orthoses, its advantages and disadvantages.



PHA 312: Introductory Pharmacology

(1 Unit C: LH 15)

Learning Outcomes

At the end of the course, students should be able to:

1. discuss prescription and/or over-the-counter medications used in the management of a variety of patient conditions encountered during rehabilitation.

Course Contents

General Principle of Pharmacology, Pharmacology for Central Nervous System disorders, skeletal muscles and cerebrovascular pharmacology and many others. Determination of dosage, application, essential chemical contents, their pharmacologic actions, route and depth of penetration of topical drugs and required instrumentations shall be taught.

PST 313: Introductory Pathology

(1 Unit C: LH 15)

Learning Outcome

At the end of the course, students should be able to:

1. discuss concepts of general pathology;
2. discuss and recognise signs and symptoms that are considered red flag for serious disease;
3. discuss and disseminate pertinent information and findings, and ascertain the appropriate steps to follow during rehabilitation;
4. describe consequences of pathologic processes on the structure and function of the human body;
5. discuss selected disorders/diseases common to acute care in the physical therapy/other rehabilitation sciences; and
6. explain normal structure and function, in relation to disease processes in the physical therapy/other rehabilitation sciences.

Course Contents

Definition of pathology. Diseases and relevant terms used in pathology. The causes and classification of diseases Cell damage and its sequel inflammation, its function and type. Inflammation – Acute inflammation: features, causes, vascular and cellular events. Chronic inflammation: Causes, Types, Classification, Repair, Wound healing by primary and secondary union, factors promoting and delaying the process. Infection and bodies' defense against it Cross infections and its control. Some important bacterial fungal and viral infections including Tuberculosis Hypertrophy, dysplasia and dystrophy Tumours, their etiology, types classifications and characteristics. Cysts, their formation and classification. Developmental anomalies or disturbances. Effects of ionising radiation on human tissues, Trauma wounds, fractures, dislocations and bleeding. Systems pathology disorders of blood- RBCs WECs and thrombocytes Disorders of circulations, the heart, and respiratory system, diseases of the Gastro-intestinal tract disorders of bones and joints. Disorders of blood: Constituents of blood and bone marrow, Regulation of hematopoiesis. Anemia: Classification, clinical features & lab diagnosis, Hemodynamic disorders, thrombo embolic disease & shock. i. Ischemic, necrosis, thrombosis, embolism, Infarction, shock. ii. Gangrene. iii. Thromboangitis obliterans. Neoplasia – Definition, classification, Biological behaviour : Benign and Malignant, Carcinoma and Sarcoma, principles of their spread. Hypersensitivity diseases and immunity – Brief overview of hypersensitivity reaction allergies & auto immune diseases. Genetic disorders – Brief over view of genetic disease. Neurovascular diseases : Outline of Cerebro-vascular disorders ii. Trauma to brain and spinal



cord. iii. Demyelinating diseases like multiple sclerosis. iv. Degenerative diseases like parkinsons disease. v. Peripheral vascular disease vi. Poliomyelitis. Metabolic disorders – Diabetic mellitus-Types, Pathogenesis, Pathology, Laboratory diagnosis.

NSC 314: Clinical Nursing Procedure

(1 Unit C: LH 15)

Learning Outcomes

At the end of the course, students should be able to:

1. evaluate of patient's status in rehabilitation;
2. identify of nursing diagnosis and patient's arrangements in rehabilitation;
3. identify and demonstrate Basic and specific assessments in nursing procedure; and
4. demonstrate Basic support techniques for patient in rehabilitation.

Course Contents

Nursing Charts: Methods of taking/recording patient's temperature, pulse, respiration: BP. Bed making: Prevention of bedsores: General skin care: Sterile dressing/bandaging, wound management, Nursing procedures in the management of surgical patients, Nursing procedures in ICU, management of ICU patients, Lifting techniques – lifting of patients: Intramuscular/Intravenous drug administration. Injection: Chemotherapy/Medication procedure on the wards, palliative care nursing: Nurse – Therapist relationship: Practical/Clinical Sessions.

AUD 311: Introduction to Audiology

(1 Unit C: LH 15)

Learning Outcomes

At the end of this course, the student should be able to:

1. relate the history of origin of audiology;
2. state the scientific principles on which audiology as a health care profession is based, and its fundamental role in the general wellbeing of humans;
3. explain his/her role in the chain of multidisciplinary management of patients with aural disorder;
4. apply the knowledge of resonance (place) and frequency theories learnt in the course;
5. explain patient's confidentiality, safety, and comfort;
6. list out the scope of practice of audiology;
7. demonstrate skill of preventive, curative and rehabilitative audiology learnt in the introductory course;
8. define the properties of sound and psychoacoustics;
9. describe the role family and significant others can and should play in the management of audiologic patients;
10. demonstrate conduct and ethical standards as required in the practice of audiology; and
11. explain an overview of audiological practice learnt in the course.



Course Contents

Philosophy and underlying principles of Audiology practices. History, ethical orientation and scope of practice. Roles of Audiology in preventive, curative and rehabilitative care. Importance of patients and patient's family in audiological treatment. Responsibilities of the clinician and the patient. Student/patient relationship. Respect and confidentiality. Patient care communication – Professional conduct and ethical practice. Teamwork. Listening and interviewing skills. Use and interpretation of verbal and nonverbal communication. Emotional responses to, and strategies for managing patient's behaviour, patient's safety and comfort. Definition of terms like vibrations, frequency, intensity and duration as related to sound. Pitch, loudness and duration as related to psychoacoustics.

AUD 312: Basic Procedures in Audiology

(1 Unit C: LH 15)

Learning Outcomes

At the end of the course, students should be able to:

1. state how to clerk a patient (case history taking) and perform the task;
2. describe some basic measurements like vital signs;
3. perform basic otoscopic examinations;
4. perform audiological examinations-both screening and diagnostic;
5. demonstrate procedure of patient clerking to reach a diagnosis and should be able to apply some advanced auditory tests for patients;
6. list out battery of tests based on case history of patients and clinical observation;
7. explain different classifications, types, configurations and site of lesions of the hearing disorder based on test findings;
8. apply the knowledge of masking technique in pure tone audiometry;
9. explain what an audiogram is and their clinical interpretations; and
10. explain what a tympanogram is and their clinical interpretations.

Course Contents

Pure tone audiometry (air/bone conduction). Masking techniques in pure tone audiometry (PTA) Tympanometry, acoustic reflex and Eustachian Tube Dysfunction tests. Manual and Video Otoscopic examination. Tuning fork tests. Auditory brain-stem response test. Oto-acoustic emission test. Speech audiometry (Speech Reception/Discrimination tests). Sensitivity prediction by acoustic reflex (SPAR) test. Comfortable loudness and uncomfortable loudness level tests. Auditory fatigue test. Test of Malingering. Vestibular tests (Optokinetic, Calorics, Gaze, Pendulum, Dix-Hallpike manouvre, Video-electronystagmography, Tracking, Saccade, Cervical vestibular electro-myogenic potential (cVEMPS) tests) etc. Behavioural audiometric test-distraction test, Cooperative test. Performance test. McCormick speech discrimination test. Visual reinforcement audiometry.



AUD 313: Medical Conditions Amenable in Audiology

(1 Unit C: LH 15)

Learning Outcomes

At the end of the course, students should be able to:

1. describe the epidemiology of communication disorders with emphasis on hearing impairment;
2. list the common Otorhinolaryngology (Ear, Nose & Throat) diseases that affects the auditory and vestibular organs;
3. explain basic neurology, disorders affecting the geriatric population as related to hearing and cognitive function, and hearing impairment in general;
4. explain other related disorders such as dementia, Alzheimer, Parkinson's that may generally impact communication;
5. demonstrate knowledge and skill of assessing basic neurology of patients and carry out the required rehabilitative counselling;
6. describe hereditary factors associated with hearing loss;
7. list out most of the common syndromes that has auditory and vestibular implications;
8. explain conditions that may necessitate medical referrals such as congenital atresia, aural stenosis, auricular microtia, unilateral hearing loss, cranio-facial abnormalities, cleft palate and many others;
9. describe various medicaments that are commonly used in cerumen management and other auditory otitis (infections); and
10. describe the existing difference between hard-of-hearing, deafness, impairment, handicap and disability.

Course Contents

Epidemiology of hearing disorder- global, regional and local. Otological considerations for hearing loss. Embryology, organogenesis of the ear and vestibular system. Post-natal anatomical development. Otophysiology, physical, mental, speech developmental and hearing. Pre and perinatal causes of hearing loss/deafness. Deafness and genetic- syndromes such as skeletal/craniofacial abnormalities. Neurological disorders associated with deafness. ophthalmological factors associated with deafness. Metabolic/endocrine disorders associated with hearing loss. Renal syndromes related to deafness. Post-natal causes of hearing loss. Geriatrics conditions associated with hearing loss. Hard of hearing and deafness. Cerebro-vascular accident and hearing impairment.

AUD 314: Surgical Conditions Amenable in Audiology

(1 Unit C: LH 15)

Learning Outcomes

At the end of the course, students should be able to:

1. list out hearing disorders or conditions that may require surgical intervention;
2. describe the audiologist role in the evaluation and surgical management of hearing impaired patients;
3. explain some secondary effects associated with surgery of the ear such as stapedectomy, cochlea implantation, bone-anchored surgical implantation and the audiologist role;
4. apply the knowledge of different implants such as cochlea implants, middle ear implants, bone-anchored implants and brain-stem implants in the selection of qualified candidates for the surgery and rehabilitation process;
5. explain the cochlea implants team composition and the key role of the audiologist in the team;



6. demonstrate ability to conduct intra-operative audiological monitoring during cochlea implant procedure; and
7. demonstrate competence in the application of pre and post-surgical audiological assessment and rehabilitation of otologic patients.

Course Contents

Tympanoplasty. Pressure Equalisation Tube-PET (grommet insertion). Myringotomy, stapedectomy. Mastoidectomy. Endolymphatic sac decompression and shunt insertion. Vestibular neurectomy. Cochleosacculotomy. Suboccipital craniotomy of cerebellopontine angle (CPA) tumour. Transcranial labyrinthectomy. Cochlea Implants. Bone-anchored hearing aids, Middle-ear implants. Brain-stem implants.

400 Level: Clinical Year I First Semester

AUD 403: Professionalism, Ethics and Administration in Audiology (2 Units C: LH 30)

Learning Outcomes

At the end of the course, students should be able to:

1. describe the importance of confidentiality in patient care, morality, ethical theories as applicable in all health professions;
2. demonstrate respect for autonomy, principles of justice, virtues and good clinician-patient relationship;
3. analyse ethical issues in audiology practice;
4. explain quality assurance processes in professional audiology practice;
5. describe the principles of evidence-based practice in audiology;
6. describe management structures in audiology practice;
7. identify audiology professional groups both local and international to affiliate with and know the process of registration for ethical standard reasons;
8. explain how to effectively work with other peers to prepare and present professional seminars in audiology; and
9. define the scope of practice and professional parameters required either as an independent practitioner or public health care setting practitioner.

Course Contents

Study design in audiology. Audiological equipment. Audiology clinic supervision and personnel management. Employment practices. Marketing and record keeping in audiology practice. Professional ethics and conduct. Clinical dress code. State and federal laws on audiology clinical practice. Government and Professional association regulating bodies in audiology. Documentation process in audiology. Insurance reimbursement.



AUD 404: Phonetics and Linguistic in Audiology

(1 Unit C: LH 15)

Learning Outcomes

At the end of the course, students should be able to:

1. describe sound, acoustics and psychoacoustics in audiology;
2. define vibrations or sound propagation, displacement, inertia, resonance, elasticity, phase, wavelength, frequency;
3. apply knowledge of decibels and intensity, and pressure as learnt in the course;
4. recall the basic principles of phonetics and its role in communication;
5. explain the application of phonetics in the assessment of communication disorder; and
6. define the fundamental concept of linguistic theories.

Course Contents

Introduction to Phonetics and Linguistics. Auditory phonetics. Physics of sound. Articulatory phonetics. Place of articulation and voicing. Acoustic phonetics. Phonetic representation. Sign-language. Application of phonetics in auditory rehabilitation.

AUD 407: Introduction to Clinical Work in Audiology

(1 Unit C: LH 15)

Learning Outcomes

At the end of this course, students should be able to:

1. demonstrate ability in the application of clinical procedures of audiology such as: case-history taking for paediatric and adult patients, tinnitus and dizzy patients;
2. explain introduction of patient to the array of tests to be conducted;
3. explain what effective conduct of battery of tests means;
4. list out the process of earphone/bone vibrator placement on the patient and describe clearly the instructions on the test procedure to the patient;
5. describe step-by-step approach to conducting basic and advanced audiological tests;
6. explain clinical report writing procedure, referral procedure, guidelines on ward round, case presentation at grand rounds;
7. define what masking is and the process of carrying out masking procedure in audiological tests;
8. describe different types of audiograms, tympanograms and analyze OAE and ABR results and how to interpret or explain same to the patient;
9. apply appropriate audiometric/speech tests on children and adults respectively;
10. explain the diagnostic relationship that exist between pure tone audiogram and speech reception/recognition findings;
11. explain how speech test result can be used to determine site of lesion in hearing impairment and the choice of hearing aids for rehabilitation purposes;
12. describe the principle and practice of sedated and non-sedated auditory brain-stem investigations in comparison to subjective behavioural audiometry;
13. demonstrate respect for professional, ethical, cultural, equal opportunity and workplace health and safety issues;
14. demonstrate ability to solve typical problems encountered in the course of carrying out a test particularly on difficult patients; and
15. demonstrate ability to make presentations at grand round academic/clinical meetings.



Course Contents

Development of entry-level skills in patient/client management. Integration of academic knowledge with clinical decision-making and critical thinking skills. Students will be assigned to clinical settings appropriate with their knowledge base at that juncture of the programme. Clinical sites may include specialty areas such as pediatrics, geriatrics, rehabilitation centres, home care settings, hearing aid centres, special schools such as schools for the hearing impaired and many others. Student will be required to present a 20-minute case report concerning one relevant case for Clinical Audiology based on Clinical experience. Clinical Audiology students along with consultants in the faculty will participate in Grand Rounds. This experience will focus on exploring the expectations of Clinical Audiology students in a clinical setting. Issues related to the therapist-patient relationship and student-clinical instructor relationship will be discussed. Issues regarding professional behavior, dealing with clinical problems will be emphasised.

AUD 409: Aural Rehabilitation

(1 Unit C: LH 15)

Learning Outcomes

At the end of the course, the students should be able to:

1. define the difference between disorder, impairment, disability and handicap;
2. demonstrate the use of different self-assessment inventories on hearing impairment;
3. describe various rehabilitative strategies such as hearing aid selection and fitting, counselling, total communication, assistive listening devices (ALDs) in managing hearing impairment in adult, aged, and children;
4. demonstrate the various methods and strategies of aural rehabilitation in the clinic;
5. list and describe different types of hearing aids;
6. explain the history of hearing aids and its evolution till date;
7. explain the importance of ear moulds in the hearing aid re(habilitation) process;
8. explain the process and importance of hearing aid verification and validation;
9. discuss other available options such as medical/surgical management in auditory rehabilitation; and
10. explain the significance of non-electroacoustic hearing devices like assistive listening devices ALDs.

Course Contents

Technical terminology-W.H.O definitions (Disorder, Impairment, Disability and Handicap), Self-Assessment inventories of hearing loss/impairment such as quantified Denver scale (QDS), self-assessment of communication (SAC), hearing handicap index (HHI), significant others assessment of communication (SOAC), hearing aid performance inventory, client oriented scale of improvement (COSI) and social hearing handicap scale (SHHS). Audiological habilitation and rehabilitation of children with hearing loss (family/client centred management, special challenges in habilitation of children, consequences of habilitation in children, educational and social impact of unilateral (one-sided) hearing loss and rehabilitation, adults hearing aid rehabilitation. Special challenges in rehabilitation of elderly adults. Group and individual rehabilitation. Relationship between auditory, neurological, speech and occupational rehabilitation.



AUD 410: Obscure Auditory Disorders/ENT Diseases

(1 Unit C: LH 15)

Learning Outcomes

At the end of the course, the students should be able to:

1. recognise the general pathology changes in inflammation and abscess formation in the outer and middle ear;
2. explain the process of degeneration in the inner ear;
3. describe the mechanism of development of oedema in both outer and the inner ear;
4. apply knowledge gleaned from the course to identify pathology of the vestibular system;
5. differentiate organic from non-organic hearing loss;
6. counsel patient and make appropriate recommendation; and
7. list out different obscure (non-organic) hearing disorder tests.

Course Contents

Introduction to general pathology- both organic and non-organic, Changes in inflammation; Suppuration; Abscess formation - effects on tissue; Repair of tissues; Factors upon which rate of repair depends; Degeneration in relation to structures in the ear; Effect of changes in circulation of hearing; Anaemia and hyperaemia; Oedema; formation and drainage of tissue fluid. Mechanism of development of oedema in the inner ear. Spurious, feigned or malingering hearing loss.

AUD 412: Noise and Auditory Conservation

(1 Unit C: LH 15)

Learning Outcomes

At the end of the course, students should be able to:

1. explain why noise is a public hazard;
2. explain the auditory impact of noise and its prevention;
3. explain hearing conservation procedures;
4. demonstrate noise survey technique using a sound level meter at industrial sites;
5. conduct baseline, monitoring and exit audiometric tests;
6. interpret and report industrial hearing test results;
7. formulate effective hearing conservation programme;
8. list out different hearing conservation devices;
9. describe medico-legal implications of noise-induced hearing loss;
10. calculate compensations for noise-induced hearing loss patients in industries;
11. explain the process of counselling employers on the use of auditory safety measures;
12. counsel employees on the need for auditory conservation for general health reasons;
13. explain appropriate steps for the prevention of noise-induced hearing loss; and
14. list out the daily permissible noise exposure criteria as documented by W.H.O.



Course Contents

Definition of noise, noise and man, noise and animals and plants; Types of noise and noise as a public health hazard; Auditory and non-auditory impact of noise; Symptoms of noise-induced hearing loss; Social, occupational, domestic, leisure and recreational noise; Measurement of noise using sound level meter (SLM) or noise dosimeters; Measures to reduce excessive noise exposure through the use of noise protective devices such as ear muffs, ear plugs, ear defenders; Legislation, litigation, awareness campaign, community and industrial noise survey and abatement programme; Multidisciplinary approach to noise control (audiologists, safety officers, environmental agencies, public health physicians, policy makers, frontline employers and employees) Challenging ideas about noise and hearing; W.H.O permissible daily noise exposure level.

AUD 414: Basic Otorhinolaryngology

(1 Unit C: LH 15)

Learning Outcomes

At the end of the course, students should be able to:

1. identify causes of diminished hearing and inability to hear in noisy environment;
2. explain vestibular disorders and how to detect infection of the outer, middle and inner ear;
3. discuss the aural pathologies in combination with nose and throat and generally upper respiratory tract infections or diseases;
4. recognise and explain any form of pathology or condition such as auricular abscess, oedema, aural deformities, auricular dermatitis, Otitis externa, otomycosis, cholesteatoma, progressive hearing loss secondary to tumour; and
5. perform cerumen management within the ambit of scope of duty of audiology practice.

Course Contents

Identification and treatment of diminished hearing. Ability and inability to hear in noisy environment. Assessing and rehabilitating tinnitus (ringing) in the ears. Vestibular disorders. Assessing and managing noise-induced, ototoxic induced, and age-induced hearing impairments. Otologic tests in detecting hearing disorders. Otitis externa. Otitis media. Types of tympanic membrane perforation. Otomycosis. Mastoiditis. Meniere's disease. Labyrinthitis. Cerebello-pontine angle tumour. Tinnitus. Vertigo. Hyperacusis diagnosis. Clinical characteristics and management of ENT related diseases. Surgical interventions such as grommet insertion for glue ears. Impacted cerumen, its hearing effect and management. Oro-nasal-pharyngeal pathologies and auditory effect.

AUD 415: Principles and Practice of Audiology

(1 Unit C: LH 15)

Learning Outcomes

At the end of the course, students should be able to:

1. list out some test batteries in audiology;
2. discuss the process of how the auditory system processes sound;
3. operate all audiological equipment, plot and report an audiogram, speech audiogram, tympanograms and interpret, manage and counsel as the case may be to the patient and family members, where necessary;
4. conduct physiologic measurement of auditory function, acoustic immittance, otoacoustic emission and other diagnostic procedures;
5. apply knowledge of battery of tests to conduct and diagnose retrocochlea pathology;



6. describe diverse types of patients audiologist assess and treat;
7. explain the process of vestibular evaluation and rehabilitation for dizzy patients; and
8. list out tests for non-organic hearing loss such as. stinger, ascending-descending (A-D) test, intensity stair test, Yes-No test, CAPD test and many others.

Course Contents

Advanced acoustics and psycho-acoustics. Decibel scale. Wavelengths. Resonance. Intensity. Frequency. Diagnostic pure tone audiometry. Speech audiometry. Immittance measurements. Oto-acoustic measurements (Transient evoked and distortion products evoked emissions). Electrocochleography. Auditory-brain stem response audiometry. Central auditory processing disorder (CAPD) tests. Vestibular assessment and rehabilitation/treatment. Tests of malingering.

AUD 416: Voice Disorder and Management

(1 Unit C: LH 15)

Learning Outcomes

At the end of the course, students should be able to:

1. explain some organic voice disorders, functional and psychogenic;
2. describe various disorders of hearing that may impact voice;
3. explain how to synergize with the speech-language therapist in the management of the case;
4. identify a patient suffering from aphonia, dysphonia in order to reach a joint diagnosis with a speech-language therapist/ENT surgeon;
5. demonstrate a skill on what equipment and how to use same for a specific auditory related voice condition;
6. apply knowledge of technique and strategies of joint management of voice and other auditory processing disorders with speech-language therapist;
7. describe the referral process of a patient with voice disorders (organic or non-organic) to the appropriate specialist; and
8. explain the clinical relationship between voice disorders and hearing.

Course Contents

Organic voice disorders, functional and psychogenic voice disorders Etiology of voice disorders; Clinical assessment of voice disorders, diagnosis and management of voice disorders; Multidisciplinary approach to treatment of voice disorders; Relationship between voice and auditory state.

AUD 417: Hearing Impairment & Deafness

(1 Unit C: LH 15)

Learning Outcomes

At the end of the course, students should be able to:

1. define the difference between hearing impairment and deafness;
2. prepare an appropriate recommendation to parents/family on the best approach to rehabilitation such as sign-language, oralism, cochlea implant, special school or mainstream education and many others;
3. explain methods employed in assessing a monaural (one-sided or unilateral) hearing loss;
4. list out steps to be taken to rule out medical condition that may be responsible for the hearing loss;



5. list out the rehabilitation strategies for patients with unilateral hearing loss such as recommendation of wireless cross hearing aid, preferential sitting placement if a school child without amplification;
6. explain the inherent implications of unilateral hearing loss without treatment/rehabilitation; and
7. counsel a patient or family on the importance of binaural hearing.

Course Contents

Hearing impairment. Hearing Disability. Hearing Handicap. Partial and total deafness. Monaural (unilateral) hearing loss. Symmetric and asymmetric hearing loss. Educational, linguistic, and social consequences of hearing impairment. Classical characteristics of hearing impairment and deafness. Treatment approach to hearing impairment and deafness.

AUD 418: Fluency Disorders and Management

(1 Unit C: LH 15)

Learning Outcomes

At the end of the course, the students should be able to:

1. define causes of fluency disorders-organic and functional;
2. explain the symptoms of fluency disorder;
3. evaluate and assess patient of fluency disorders in order to reach a mechanical and functional diagnosis;
4. plan and execute treatment under supervision;
5. identify conditions with respect to their signs and symptoms;
6. demonstrate ability to carry out audiometric test to ascertain any form of hearing loss as an underlining cause of fluency disorders; and
7. describe how to synergise with the speech-language therapist (SLT) on treatment/rehabilitation of patients with fluency disorders.

Course Contents

Normal fluency versus non-fluency; Nature, types, etiology, symptoms, theories, classification, assessment, prognostic indicators and management of fluency disorders; Fluency and hearing.

FMR 404: Research Methods in Medical Rehabilitative

(4 Units C: LH 60)

Learning Outcomes

At the end of the course, students should be able to:

1. demonstrate understanding of research methodology;
2. explain the meaning of research, objectives of research, types of research & research approaches;
3. formulate research problem: Statement of research problem Statement of purpose and objectives of research problem;
4. define research problem;
5. formulate research design;
6. demonstrate meaning of research design;
7. explain the need for research design;
8. carry out sampling design, criteria for selecting sampling procedure;
9. conduct measurement & scaling techniques;
10. demonstrate measurement in research- measures of scales, sources of error in measurement;



11. demonstrate ability of carrying out methods of data collection, collection of primary data, sampling fundamentals, need for sampling; and
12. demonstrate ability of conducting analysis of data: Types of analysis, testing of hypothesis, and basic concept of research.

Course Contents

Introduction to Biostatistics 1. Definition – Statistics, Biostatistics 2. Applications of Biostatistics 3. Data collection from experiments & surveys. 4. Variable – Qualitative & Quantitative, Discrete and continuous. 5. Presentation of Data: - a) Tabular Presentation of Data – Statistical Table, Format of a Table. b) Frequency Distribution – construction of Frequency Distribution, cumulative and relative frequency distribution, Exclusive and inclusive method of classification of data. c) Diagrammatic Presentation of Data: - Bar diagrams, Pie Diagram, Line Diagram, Pictogram, Cartogram or Statistical map.d) Graphical representation of a Frequency distribution – Histogram, Frequency Polygon, Frequency curve, ogives or cumulative frequency curves.

500 Level

AUD 503: Community Audiology

(2 Units C: LH 15; PH 45)

Learning Outcomes

At the end of the course, students should be able to:

1. explain the epidemiology of hearing loss in Nigeria;
2. describe the historical background of community hearing screening programme;
3. demonstrate competence in hospital neonatal hearing screening programme;
4. conduct rural community hearing screening programme;
5. explain the importance of multi-disciplinary approach to community audiology;
6. list out characteristics that will necessitate referrals to other specialists.;
7. demonstrate knowledge and skill of planning and executing community audiology programme; and
8. explain the advantages, disadvantages and problems associated with community audiology practice.

Course Contents

Principles and practice of community Audiology: Definition – Community Audiology. Historical background of community Audiology. Types of community audiology, tools for community audiology, personnel for community audiology, follow-up strategies on community audiology. Challenges of community audiology.



AUD 505: Counselling and Hearing Impairment

(2 Units C: LH 15; PH 45)

Learning Outcomes

At the end of the course, students should be able to:

1. recognise the need and reason for counselling in audiological practice and apply such knowledge;
2. list out the use and importance of counselling tools for different age groups in audiology;
3. describe some psychotherapeutic techniques used in counselling especially in communication disorder;
4. select the appropriate counselling tools as learnt in the course;
5. demonstrate counselling skill not only on hearing impaired individual but also offer useful information on hearing aids, cochlea implants and their use and maintenance;
6. apply the knowledge of when to refer a patient to a professional counsellor/psychologist; and
7. describe how communication disorders with emphasis on hearing impairment could affect quality of life as well as the impact on family and society in general.

Course Contents

Auditory and non-auditory effects of hearing loss. Psychological effect of hearing impairment. Counselling tools on acceptance of hearing loss and rehabilitation. Stages of acceptance of hearing loss. Personality, gender, family, faith, age, attitude and cultural effect on acceptance. Individual and group counselling techniques. Advantages and disadvantages of individual and group counselling.

AUD 507: Aging and Communication disorder

(1 Unit C: LH 30)

Learning Outcomes

At the end of the course, students should be able to:

1. define factors affecting health, well being and communication of aging people;
2. list clinical features of normal, demented and depressed elderly individual and ascertain its impact on communication;
3. apply different clinical inventories such as hearing impairment handicap Inventory to assess the state of communication of the elderly patient;
4. describe the major comorbidities of hearing impairment in elderly patients;
5. describe different types of age-induced hearing loss (presbycusis)- sensory, metabolic, neural and conductive types; and
6. demonstrate how to jointly manage an elderly patient with multiple ailments.

Course Contents

Dementia. Multiple Sclerosis. Hypertension. Diabetes. Clinical Depression. Bereavement & Grief. Cerebro-vascular disorder (Stroke). Presbycusis and types. Dizziness. Vertigo. Tumor and Cancer. Geriatric audiologic inventories. Aphasic tests. Tests of Dementia. Multi-disciplinary treatment of aged population. Depressed and aphasic elderly population. Audiologic audiograms of Aged population.



AUD 508: Tinnitus, Vestibular Disorders and Rehabilitation (2 Units C: LH 15; PH 45)

Learning Outcomes

At the end of the course, students should be able to:

1. recognise tinnitus, know how to examine, clinically assess and describe different characteristics of tinnitus and explain the rehabilitation procedure of tinnitus;
2. conduct procedures such as Tinnitus Matching, Tinnitus Loudness tests, tonal masking level and rehabilitate using various theories and clinical devices for the management of tinnitus;
3. assess a range of vestibular cases, using the assessment procedures routinely undertaken in clinical practice such as Video Electronystagmographic (VENG), Calorics, Vestibular Evoked Myogenic Potential (VEMPS);
4. manage tinnitus and vestibular disorder patients using audiology rehabilitation technique; and
5. demonstrate ability to refer where there's a medical, pharmacological and or surgical factors behind the tinnitus or vestibular disorder (dizzy spells).

Course Contents

Definition of tinnitus (ringing in the ear). Types of tinnitus. Causes of tinnitus. Otologic and audiologic investigations of tinnitus. Tinnitus matching test. Tinnitus loudness test. Tinnitus masking level test. Low and high frequency tinnitus. Multi-frequency tinnitus. Outside tonal sound tinnitus. Tinnitus Handicap Index (THI) inventory. Medical, audiologic, pharmacologic and surgical treatment of tinnitus. Vertigo (dizziness). Etiology of dizziness. Clinical features of dizziness. Assessment and rehabilitation procedures of dizziness.

AUD 509: Rehabilitation and Audiological Functional Training (1 Unit C: PH 45)

Learning Outcomes

At the end of the course, students should be able to:

1. select different hearing devices and implants;
2. demonstrate knowledge of other members of the rehabilitation team vis-a-vis their role in rehabilitation and functional training;
3. select the appropriate hearing aids based on clinical finding, affordability, ergonomics and choice of the patients;
4. demonstrate ability to work as a team member in the rehabilitation programme involving other specialists;
5. list out training plans for parents or care givers on the procedure of using and maintaining hearing devices; and
6. demonstrate ability to determine other specialized needs of the elderly patients undergoing audiology rehabilitation.

Course Contents

Audiological rehabilitation devices. Hearing aids. Cochlea/brain-stem Implants. Assistive listening devices (ALDs) Bone-anchored hearing aids/bone conduction hearing aids. Advantages and disadvantages of hearing devices. Role of Occupational therapy. Role of Speech therapy. Role of Medical social worker and vocational rehabilitation in auditory care.



AUD 510: Clinical Work in Audiology

(2 Units C: LH 15; PH 45)

Learning Outcomes

At the end of the course, students should be able to:

1. demonstrate knowledge of the clinical practice of audiology in both diagnostic and rehabilitative settings;
2. demonstrate competence of application of holistic treatment for hearing impaired patients due to the linguistic, psychosocial, and other besetting conditions;
3. explain some of the nature of the problems underlying referral for audiological services;
4. apply the knowledge acquired in the course in the assessment and rehabilitation of paediatric, adult patients and special population groups; and
5. define the role of audiologist within the health care services and the relationship with other health providers in the health care facility.

Course Contents

Clinical decision-making and critical thinking skills in audiology. Relevant clinical sites for audiology students-paediatrics, geriatrics, otorhinolaryngology, neurology, speech-language pathology, occupational therapy, Social welfare. Ground rounds in audiology. Case report in audiology. Clinician-patient relationship. Clinical instructor-student relationship. Professional behaviour and conduct. Basic clinical problems in audiology.

AUD 511: Special Topic Seminar in Audiology

(2 Units C: LH 30)

Learning Outcomes

At the end of the course, students should be able to:

1. demonstrate ability to choose from a myriad of topics in audiology to present at a seminar;
2. demonstrate ability to define the topic;
3. demonstrate ability to do literature search on the topic;
4. demonstrate ability to articulate their points and convince audience on the topic being presented;
5. explain in detail the clinical or academic relevance of the seminar topic being presented;
6. demonstrate ability to absorb criticism; and
7. demonstrate ability to synthesise ideas advanced by superiors, supervisors or course coordinator.

Course Contents

Current trends and issues in allied health professions. Group discussions relating to philosophy and methods of treatment in rehabilitation. Discussions on each medical rehabilitation profession. Examination of problems and issues in rehabilitation. Ethics in rehabilitation practice. Administrative issues in rehabilitation.

AUD 512: Research Project

(4 Units C: PH 180)

Learning Outcomes

At the end of the project, students should be able to:

1. present the process of executing their project topics;
2. defend their capability of independent (research) studies; and
3. present acceptable dissertations.



Course Contents

Project writing in audiology. Steps in project writing. Methods of data collection. Choice of topic in audiology. Sampling technique in project. Literature review in audiology project. Analysis of data. Submission and defense of project.

AUD 513: Geriatric Audiology

(2 Units C: LH 30)

Learning Outcomes

At the end of the course, students should be able to:

1. define aging and at what age the label aging is employed;
2. explain different audiological, social and psychological characteristics of aged people;
3. list the established co-morbidities of aged people;
4. perform audiological tests on aging population;
5. explain instructions given to aged population in the conduct of audiological tests;
6. explain different types of presbycusis i.e. age-induced hearing loss;
7. list out techniques of rehabilitation in the aged population; and
8. explain the multi-disciplinary approach to treatment of the aged population.

Course Contents

Definition of the aged; Identification of characteristics of aged population; Geriatric communication and evaluation; Peculiarities of communication methods by the aged population; Challenges and specific audiological ways of assessing aged people; Psychology of the aged population; Audiogram pattern of age-induced hearing loss; Co-morbidities of the aged population and audiological implications; Rehabilitation process of the aged population.

Minimum Academic Standards

Equipment

1. Manual Otoscopes
2. Video Otoscopes
3. Clinical Microscopes
4. Pen lights
5. Kamplex PA5 Paediatric Portable audiometer
6. EB 22 Neonatal Stik for neonatal screening
7. Fricosil Ear Impression Materials
8. Ear Impression Syringe/tamps or ear dams
9. Automated Ear Syringing Pump for the removal of wax or debris from the ear canal (Pro-Pulse 2)
10. Suction Machine (Microfield)
11. Screening Audiometers (GSI 18 or Amplivox 116)
12. Diagnostic Audiometers (GSI AudioStar Pro or Amplivox 270)
13. Middle Ear Analyzers (GSI Tymptstar)
14. Handheld Screening Tympanometers (GSI Allegro or Amplivox Otowave 202-H)
15. Diagnostic Tympanometers (GSI Tymptstar Pro or Amplivox Otowave 302)
16. Portable Screening Oto-Acoustic Emission (GSI Corti)



17. Combined Diagnostic Oto-Acoustic Emission, Auditory Brain-Stem and Auditory Steady-State Response (OAE/ABR/ASSR) (GSI Audera Pro)
18. Single Chamber Audiology Screening Testing Booth
19. Double Chamber Audiology Diagnostic Testing Booth
20. Hearing Aid Verification Equipment with insert earphones (GSI Auditdata)
21. Complete Ear Mould Laboratory
22. Videonystagmography Equipment for dizzy patients
23. Video Head Impulse Test Equipment
24. Stock of Analogue and Digital Hearing Aids (Body worn, Behind-The-Ear, In-The-Canal, In-The Ear, Programmable Types)
25. Stock of Hearing Aid Batteries

The list of the equipment with justification:

| Item | Item Description | Item justification |
|------|---|--|
| 1 | Audiometric Suite with control and test booth | This room will be used for all audiometric evaluation |
| 2 | Audiology diagnostic lab: 4 Clinical/full diagnostic computerised audiometers with Boost Amplifier and loudspeakers and Pediatric conditioned orienting response system (including Computer) | This equipment will permit to determine hearing level both in adult and children (via visual reinforcement audiometry). Moreover, it should permit with the speaker to test hearing aid (sound field testing). |
| 3 | Audiology Screening lab: 4 Portable screening audiometers | This will permit quick screening of hearing anywhere |
| 4 | Middle Ear diagnostic lab: 4 Diagnostic Middle ear analyser 4 Screening tympanometers | Tympanometer – This is for middle ear analysis. For tympanometry and acoustic reflex |
| 5 | Electrophysiologic lab I: 4 Otoacoustic emission System(both screening and diagnostic) | This system will test the functionality of the cochlear outer hair cells (TEOAE and DPOAE) |
| 6 | Electrophysiologic lab II: Screening 2 Automated Auditory Brainstem Response –AABR screeners | This tool is fundamental for screening children for hearing loss. |
| 7 | Electrophysiologic lab II: | Auditory Brainstem Response (ABR) For hearing test especially early |



| | | |
|---|---|---|
| | Diagnostic 4 Auditory Evoked Potential System with computer: | detection (both cochlear and retro cochlear pathologies of patients of all ages including newborns). This 2-channel system with transducers (Insert earphones, bone oscillator) and reusable electrode cables will permit to determine hearing thresholds via different stimulus types (click, tone burst, chirp). It will also permit testing via Vestibular Evoked Myogenic Potential (VEMP) and Auditory Steady State Response (ASSR) and Electrocochleography (EcochG). |
| 8 | 2 Sound level Meters for noise measurement | Permits to measure sounds within specific area of industries, clinics or community |
| 9 | Audiology Simulation lab 10 units of simulation audiometers | This will permit students to practice on their own the use of the audiometer and master the technique of testing patients in real life |

The above batteries will be used to train students of Audiology on assessment of hearing loss, be it conductive, sensorineural, mixed, cochlear and retro cochlear. Some of these batteries will suggest the causes such as the ones caused by: Meniere's disease, Noise exposure, Otosclerosis, Presbycusis (Old age) and many others.

| | | |
|----|---|--|
| 1. | Audiology consultation lab: 5 units of Video Oscopes 6 units of portable otoscopes | Permit to teach the student about the ear canal and tympanic membrane, detection of outer ear infections |
| 2. | Hearing Aid/Cochlea Implant lab II: 2 Real ear analyzer (Verification Equipment) 2 Cochlea implant mapping device 2 Neural Response Telemetry (NRT)computers | This equipment is the main element of hearing aid verification and validation. It is the best practice, gold standard in hearing aid fitting. It is proven as a strategy for increasing satisfaction with hearing aids and have been for many years. |
| 3. | Hearing Aid lab II: (Impression taking, Earmold making/Hearing aid repair and modification system) | This laboratory will include earmold impression supplies and materials like impression gun with disposable cartridges, oto-blocks, |



| | | |
|--|--|--|
| | | earmold/hearing aid modification products. |
|--|--|--|

The hearing aid lab and its equipment are essential in teaching students about hearing aid.

| | | |
|----|---|---|
| 1. | 1 Dizziness lab: 1 Videoelectronystagmography (VENG) system and caloric irrigation system 1 Rotatory chair 2 Dynamic Posturography | The VNG test assesses the vestibular function of the inner ear and helps determine if a disorder in the vestibular system is contributing to a patient's dizziness or imbalance. For this test the patient must wear a pair of goggles which records eye movements. |
| 2. | Video head impulse test | This equipment will allow to test all 6 semi-circular canals (Rt & Lt Ears) at the same time. |

Staffing

1. Due to dearth of qualified professionals in the field a minimum of one full time persons of a professorial cadre (full/associate),
2. 2 Senior Lecturer
3. 3 lecturer I and below
4. 2 research assistants/assistant lecturers
5. 2 clinical staff in audiology of nothing less than MSc degree in audiology
6. 1 secretary with computer literacy knowledge and skills
7. 1 laboratory technician
8. 1 messenger

Library Resources

1. Reference books on Audiology, Hearing Loss/Impairment, ENT, and Speech-Language Pathology
2. Journals/Periodicals in Audiology, ENT and Hearing Impairment
3. Simulated Medical Charts
4. Software and multimedia facility for teleaudiology
5. Computers

Office Equipment

1. Copy machine
2. Document shredder
3. Internet connection
4. Laptop for HOD, Secretary and academic members of staff
5. Portable projector (data show)
6. Office furniture/cabinets/book shelves



Laboratory/Clinical Space

1. Reception Room
 - a. Paediatric reception with a small play room
 - b. Adult reception
2. Paediatric assessment and evaluation clinic
3. Adult assessment and evaluation clinic
4. Ear impression/Ear Mould/ Hearing Aid Laboratory
5. Vestibular/Tinnitus Assessment Room
6. 3 consulting rooms

Classrooms, laboratories and office spaces

Classroom

The standard requirement of 0.65m² per full-time student should be maintained. Thus the minimum total space requirement for a faculty or department shall be the product of its total full time equivalent student enrolment (FTE) and the minimum space requirement per full-time equivalent i.e. (FTE) 0.65m².

Office

In this respect, each academic staff should have an office space of at least 25 square metres taking into cognisance the status/cadre of the staff

In addition, there should be for the Faculty, a Dean's office and for each Department a Head of Department's office with attached offices for their supporting staff as specified below in m²:

| | | |
|----------------------------------|---|-------|
| Professor's office | - | 18.50 |
| Head of Department's office | - | 18.50 |
| Tutorial teaching staff's office | - | 13.50 |
| Other teaching staff space | - | 7.00 |
| Technical staff space | - | 7.00 |
| Secretarial space | - | 7.00 |
| Staff research laboratory | - | 16.50 |
| Seminar Space/per student | - | 1.85 |
| Laboratory space (per student) | - | 7.50 |

Four classrooms, one lecture theatre and one seminar room should be provided for the programme



B.Sc. Complementary and Alternative Medicine

Overview

The goal of the Complementary and Alternative Medicine programme is to train personnel and obtain manpower that are knowledgeable in basic, medical, pharmaceutical, botanical and social sciences that will be competent to practice as health professionals, using available facilities to deliver acceptable quality healthcare services.

Complementary and Alternative Medicine (CAM) is the term for medical products and practices that are not part of standard medical care, it includes practices such as massage, acupuncture, tai chi and ayurvedic.

The curriculum will cover African Traditional Medicine methods, Traditional Chinese Medicine, the Chiropractic practice, Osteopathy, Homeopathy and Naturopathy. The programme will be domiciled in the Faculty of Allied Health Sciences.

Philosophy

The philosophy of Complementary and Alternative Medicine are:

1. a holistic approach to health care, including the interactions between physical, spiritual, social and psychological aspects;
2. it focuses on empowering the individual to accept responsibility for at least, a part of the task of recovery and future health maintenance;
3. it emphasises sound nutrition as a core requirements for health;
4. it recommends a balanced lifestyle, adequate and appropriate exercise, rest, sleep and relaxation as prerequisites for a state of good health;
5. it attempts to ensure detoxification and the efficacy of the organs and systems of the body;
6. it recognises the importance of the musculoskeletal system as a potential source of interference with nerve transmission and the body's energy pathways, and as a reflection of the individuals internal physical and emotional state; and
7. most importantly, holistically treats the individual instead of his or her symptoms.

Objectives

The objectives of Complementary and Alternative Medicine are to:

1. provide world-wide and world-renown alternative system of healthcare;
2. increase the number of collaborative healthcare workers, thereby, reducing morbidity and mortality;
3. provide the knowledge and skills needed for Complementary and Alternative Medicine practices;
4. promote research and development in Complementary and Alternative Medicine; and
5. facilitate collaboration between orthodox and traditional medicine practitioners.

Unique Features of the Programme

Complementary and Alternative Medicine programme is a new course in Nigeria, hence, there is virtually no local existing programme or template to follow. Internationally, Complementary and Alternative Medicine programme is studied as an undergraduate course. It is offered at undergraduate level in the USA, Canada and Europe. It teaches the students about alternative



medicines and medical practices that have not yet been accepted by mainstream clinical care, although their effects improve patient health and recovery. CAM practices are divided into: alternative medical systems, mind-body interventions, manipulative methods, and energy therapies. Graduates may work as therapists, physicians, nutritionists and health administrators.

Employability Skills

On completion of the programme, it is expected that graduates will be registered with the relevant regulatory body and be eligible to practice as healthcare professionals, after internship in government approved institutions.

Graduates may find employment:

1. as a civil/public servant in the public health service sector (such as in NAFDAC, Research Institutes, Universities or Ministries of Health);
2. in private hospitals, establishments or institutions (including teaching, research, manufacturing, quality control or marketing of comparative and alternative medicine products or work in related fields, such as pharmaceuticals or foods);
3. set up a personal private herbal production, wholesale, retail or clinical practice outfit as a community practitioner, providing basic primary healthcare;
4. employment either in the Regulatory and Services Agencies under the Ministry of Health (Nigerian Health Service, Traditional and Alternative Medicines Directorate, Traditional Medicines Practice Council, Centre for Scientific Research into Plant Medicine, and many others.); and
5. research Institutes and Quasi-Government Health Facilities, Faith-based Organisations and NGOs in Health or may set up their own practices as General Practitioners.
6. in addition, graduates should exhibit potentials for postgraduate studies in Comparative and Alternative Medicine and other related science subjects and in future become academics, specialising in various areas of Comparative and Alternative Medicine and or related science specialties.

21st Century Skills

1. Collaboration and team work.
2. Creativity and imagination.
3. Critical thinking.
4. Problem solving.
5. Flexibility and adaptability.
6. Information Literacy.
7. Leadership.
8. Civic literacy and citizenship.
9. Oral and written Communication Skills.
10. Social responsibility.
11. Technology literacy.



Admission and Graduation Requirements

Admission Requirements

Candidates may be admitted by Four-Year Programme or by Direct Entry.

Four-Year Programme

The minimum academic requirements is credit level passes in five subjects at Senior Secondary Certificate including; English Language, Mathematics, Physics, Chemistry and Biology at not more than two (2) sittings and an acceptable pass mark at the UTME conducted by the Joint Admission and Matriculation Board (JAMB).

Direct Entry

Candidate seeking admission through this mode should in addition to a minimum of five SSC credit passes possess:

1. Passes in Physics, Chemistry and Biology at the Higher School Certificates or Advanced Level of General Certificate Examination or its equivalent OR
2. An acceptable First Degree of minimum of second class lower in relevant Biological or Physical Science disciplines.

Graduation Requirements

To be eligible for graduation, the student must:
satisfy all conditions for graduation with an overall class attendance of not less than 70% in all the modules, which must be passed with no less than 40% in each modular course, including the clinical training sessions and field trips; and
satisfy all other requirements of the Department of Comparative and Alternative Medicine and of the admitting university.

The candidate must also attain the following:
minimum of three and maximum of five academic sessions for DE candidates;
minimum of four and maximum of six academic sessions for UTME candidates;
a student will be awarded certificate on the basis of total credits attained in final examination. the continuous assessment will be 40% while the final examination carries 60% in each course. UTME candidates are required to earn a minimum of 120 Total Credits Units Earned (TCUE) and 90 TCUE for Direct Entry student before graduation. Minimum CGPA for graduation: 1: 00



Global Course Structure

100 Level

| Course code | Course title | Unit(s) | Status | LH | PH |
|-------------|---------------------------------|-----------|--------|----|----|
| GST 111 | Communication in English | 2 | C | 15 | 45 |
| GST 112 | Nigerian Peoples and Culture | 2 | C | 30 | - |
| BIO 101 | General Biology I | 2 | C | 30 | - |
| BIO 102 | General Biology II | 2 | C | 30 | - |
| CHM 101 | General Chemistry I | 2 | C | 30 | - |
| CHM 102 | General Chemistry II | 2 | C | 30 | - |
| CHM 107 | Practical Chemistry I | 1 | C | - | 45 |
| CHM 108 | Practical Chemistry II | 1 | C | - | 45 |
| MTH 101 | Elementary Mathematics I | 2 | C | 30 | - |
| PHY 101 | General Physics I | 2 | C | 30 | - |
| PHY 102 | General Physics II | 2 | C | 30 | - |
| PHY 107 | General Experimental Physics I | 1 | C | - | 45 |
| PHY 108 | General Experimental Physics II | 1 | C | - | 45 |
| | Total | 22 | | | |

200 Level

| Course code | Course title | Unit(s) | Status | LH | PH |
|-------------|--|-----------|--------|----|----|
| ENT 211 | Entrepreneurship and Innovation | 2 | C | 30 | - |
| GST 212 | Philosophy, Logic and Human Existence | 2 | C | 30 | - |
| ANA 201 | Anatomy of Upper and Lower Limbs | 2 | C | 30 | 45 |
| BCH 201 | General Biochemistry I | 2 | C | 30 | 45 |
| BCH 216 | Biochemistry practical | 2 | C | - | 90 |
| PIO 201 | Introductory Physiology & Blood | 2 | C | 30 | - |
| PHA 201 | General Pharmacology | 2 | C | 30 | - |
| MCB 201 | Introduction to Microbiology and Infection Control | 2 | C | 30 | - |
| ANA 202 | Histology of Basic Tissues | 2 | C | 15 | 45 |
| ANA 204 | Anatomy of Thorax Abdomen, Pelvis & Perineum | 2 | C | 15 | 45 |
| PIO 203 | Physiology of Excitable Tissues | 2 | C | 30 | - |
| | Total | 22 | | | |



300 Level

| Course Code | Course title | Unit(s) | Status | LH | PH |
|--------------------|--|----------------|---------------|-----------|-----------|
| ENT 312 | Venture Creation | 2 | C | 15 | 45 |
| GST 312 | Peace and Conflict Resolution | 2 | C | 30 | - |
| APT 301 | Principles of Diseases and Pathology | 2 | C | 30 | - |
| CPY 311 | Introductory Immunology | 2 | C | 30 | - |
| CPY 302 | Intorductory Chemical Pathology | 2 | C | 30 | - |
| CAM 301 | Introduction to Herbal Medicine | 2 | C | 30 | - |
| CAM 305 | Introduction to Chiropractic | 2 | C | 30 | - |
| CAM 310 | Introduction to Naturopathy | 2 | C | 30 | - |
| CAM 317 | Introduction to Homeopathy | 2 | C | 30 | - |
| CAM 318 | Traditional Chinese Medicine | 2 | C | 30 | - |
| CAM 319 | Introduction to African Traditional Medicine | 2 | C | 30 | - |
| CAM 301 | Naturopathy | 2 | C | 30 | - |
| | Total | 24 | | | |

400 Level

| Course Code | Course title | Unit(s) | Status | LH | PH |
|--------------------|--|----------------|---------------|-----------|-----------|
| CAM 402 | Clinical Training | 4 | C | - | 160 |
| CAM 413 | Research Methodology | 3 | C | 45 | |
| CAM 414 | Policy, Laws and Ethics in Complementary and Alternative Medicine practice | 3 | C | 45 | - |
| CAM 404 | Public Health in Complementary and Alternative Medicine | 2 | C | 30 | - |
| CAM 400 | Project | 6 | C | - | 270 |
| | Total | 18 | | | |



Course Contents and Learning Outcomes

100 Level

GST 111: Communication in English I

(2 Units C: LH 15; PH 45)

Learning Outcomes

At the end of this course, students should be able to:

1. identify possible sound patterns in English Language;
2. list notable Language skills;
3. classify word formation processes;
4. construct simple and fairly complex sentences in English;
5. apply logical and critical reasoning skills for meaningful presentations; and
6. demonstrate an appreciable level of the art of public speaking and listening.
7. write simple and technical reports.

Course Contents

Sound patterns in English Language (vowels and consonants, phonetics and phonology). English word classes (lexical and grammatical words, definitions, forms, functions, usages, collocations). Sentence in English (types: structural and functional, simple and complex). Grammar and Usage (tense, mood, modality and concord, aspects of language use in everyday life). Logical and Critical Thinking and Reasoning Methods (Logic and Syllogism, Inductive and Deductive Argument and Reasoning Methods, Analogy, Generalisation and Explanations). Ethical considerations, Copyright Rules and Infringements. Writing activities: (Pre-writing, Writing, Post writing, Editing and Proofreading; Brainstorming, outlining, Paragraphing, Types of writing, Summary, Essays, Letter, Curriculum Vitae, Report writing, Note making and many others. Mechanics of writing). Comprehension Strategies: (Reading and types of Reading, Comprehension Skills, 3RsQ). Information and Communication Technology in modern Language Learning. Language skills for effective communication. Major word formation processes. Writing and reading comprehension strategies. Logical and critical reasoning for meaningful presentations. Art of public speaking and listening.

GST 112: Nigerian Peoples and Culture

(2 Units C: LH 30)

Learning Outcomes

At the end of the course, students should be able to:

1. analyse the historical foundation of the Nigerian culture and arts in pre-colonial times;
2. list and identify the major linguistic groups in Nigeria;
3. explain the gradual evolution of Nigeria as a political unit;
4. analyse the concepts of Trade, Economic and Self-reliance status of the Nigerian peoples towards national development;
5. enumerate the challenges of the Nigerian State towards Nation building;
6. analyse the role of the Judiciary in upholding people's fundamental rights;
7. identify acceptable norms and values of the major ethnic groups in Nigeria; and
8. list and suggest possible solutions to identifiable Nigerian environmental, moral and value problems.



Course Contents

Nigerian history, culture and art up to 1800 (Yoruba, Hausa and Igbo peoples and culture; peoples and culture of the ethnic minority groups). Nigeria under colonial rule (advent of colonial rule in Nigeria; Colonial administration of Nigeria). Evolution of Nigeria as a political unit (amalgamation of Nigeria in 1914; formation of political parties in Nigeria; Nationalist movement and struggle for independence). Nigeria and challenges of nation building (military intervention in Nigerian politics; Nigerian Civil War). Concept of trade and economics of self-reliance (indigenous trade and market system; indigenous apprenticeship system among Nigeria people; trade, skill acquisition and self-reliance). Social justices and national development (law definition and classification. Judiciary and fundamental rights. Individual, norms and values (basic Nigeria norms and values, patterns of citizenship acquisition; citizenship and civic responsibilities; indigenous languages, usage and development; negative attitudes and conducts. Cultism, kidnapping and other related social vices). Re-orientation, moral and national values (The 3R's – Reconstruction, Rehabilitation and Re-orientation; Re-orientation Strategies: Operation Feed the Nation (OFN), Green Revolution, Austerity Measures, War Against Indiscipline (WAI), War Against Indiscipline and Corruption (WAIC), Mass Mobilisation for Self-Reliance, Social Justice and Economic Recovery (MAMSER), National Orientation Agency (NOA). Current socio-political and cultural developments in Nigeria.

BIO 101: General Principles of Biology

(2 Units C: LH 30)

Learning Outcomes

At the end of lectures in Plant Biology, students should be able to:

1. explain cell structure and organisation;
2. summarise functions of cellular organelles;
3. characterise living organisms and state their general reproduction;
4. describe the interrelationship that exists between organisms;
5. discuss the concept of heredity and evolution; and
6. enumerate habitat types and their characteristics.

Course Contents

Cell structure and organisation. functions of cellular organelles. characteristics and classification of living things. chromosomes, genes their relationships and importance. General reproduction. Interrelationships of organisms (competitions, parasitism, predation, symbiosis, commensalisms, mutualism, saprophytism). Heredity and evolution (introduction to Darwinism and Lamarckism, Mendelian laws, explanation of key genetic terms). Elements of ecology and types of habitat.

BIO: 102 General Principles of Biology II

(2 Units C: LH 30)

Learning Outcomes

At the end of the lectures in Introductory Ecology, students should be able to:

1. list the characteristics, methods of identification and classification of viruses, bacteria and fungi;
2. state the unique characteristics of plant and animal kingdoms;
3. describe ecological adaptations in the plant and animal kingdoms;
4. explain nutrition, respiration, excretion and reproduction in plants and animals; and
5. describe growth and development in plants and animals.



Course Contents

Basic characteristics, identification and classification of viruses, bacteria and fungi. A generalised survey of the plant and animal kingdoms based mainly on the study of similarities and differences in the external features. Ecological adaptations. Briefs on physiology to include nutrition, respiration, circulatory systems, excretion, reproduction, growth and development.

CHM 101: General Chemistry I

(2 Units C: LH 30)

Learning Outcomes

At the end of this course, students should be able to:

1. define atom, molecules and chemical reactions;
2. discuss the Modern electronic theory of atoms;
3. write electronic configurations of elements on the periodic table;
4. rationalise the trends of atomic radii, ionization energies, electronegativity of the elements based on their position in the periodic table;
5. identify and balance oxidation – reduction equation and solve redox titration problems;
6. draw shapes of simple molecules and hybridized orbitals;
7. identify the characteristics of acids, bases and salts, and solve problems based on their quantitative relationship;
8. apply the principles of equilibrium to aqueous systems using LeChatelier's principle to predict the effect of concentration, pressure and temperature changes on equilibrium mixtures;
9. analyse and perform calculations with the thermodynamic functions, enthalpy, entropy and free energy; and
10. determine rates of reactions and its dependence on concentration, time and temperature.

Course Contents

Atoms, molecules and chemical reaction. Chemical equation and stoichiometry, Atomic structure and periodicity. Modern electronic theory of atoms. Radioactivity. Chemical bonding. Properties of gases. Equilibria and Thermodynamics. Chemical Kinetic Electrochemistry.

CHM 102: General Chemistry II

(2 Units C: LH 30)

Learning Outcomes

At the end of this course, students should be able to:

1. state the importance and development of organic chemistry;
2. define fullerenes and its applications;
3. discuss electronic theory;
4. determine the qualitative and quantitative of structures in organic chemistry;
5. describe rules guiding nomenclature and functional group classes of organic chemistry;
6. determine rate of reaction to predict mechanisms of reaction;
7. identify classes of organic functional group with brief description of their chemistry;
8. discuss comparative chemistry of group 1A, IIA and IVA elements; and
9. describe basic properties of Transition metals.



Course Contents

Historical survey of the development and importance of Organic Chemistry. Fullerenes as fourth allotrope of carbon, uses as nanotubules, nanostructures, nanochemistry. Electronic theory in organic chemistry. Isolation and purification of organic compounds. Determination of structures of organic compounds including qualitative and quantitative analysis in organic chemistry. Nomenclature and functional group classes of organic compounds. Introductory reaction mechanism and kinetics. Stereochemistry. The chemistry of alkanes, alkenes, alkynes, alcohols, ethers, amines, alkyl halides, nitriles, aldehydes, ketones, carboxylic acids and derivatives. The Chemistry of selected metals and non-metals. Comparative chemistry of group IA, IIA and IVA elements. Introduction to transition metal chemistry.

CHM107: Practical Chemistry I

(1 Unit C: PH 45)

Learning Outcomes

At the end of this course, students should be able to:

1. describe the general laboratory rules and safety procedures;
2. collect scientific data and correctly carrying out Chemical experiments;
3. identify the basic glassware and equipment in the laboratory;
4. identify the differences between primary and secondary standards;
5. perform redox titration;
6. recording observations and measurements in the laboratory notebooks; and
7. analyse the data to arrive at scientific conclusions.

Course Contents

Laboratory experiments designed to reflect topics presented in courses CHM 101 and CHM 102. These include acid-base titrations, qualitative analysis, redox reactions, gravimetric analysis, data analysis and presentation.

CHM 108: General Chemistry Practical II

(1 Unit C: PH 45)

Learning Outcomes

At the end of this course, the students should be able to:

1. identify the general laboratory rules and safety procedures;
2. collect scientific data and correctly carrying out Chemical experiments;
3. identify the basic glassware and equipment in the laboratory;
4. identify and carry out preliminary tests which includes ignition, boiling point, melting point, test on known and unknown organic compounds;
5. perform solubility tests on known and unknown organic compounds;
6. conduct elemental tests on known and unknown compounds; and
7. conduct functional group/confirmatory test on known and unknown compounds which could be acidic / basic / neutral organic compounds.

Course Contents

Continuation of CHM 107. Additional laboratory experiments to include functional group analysis, quantitative analysis using volumetric methods.



MTH 101: Elementary Mathematics (Algebra and Trigonometry) (2 Units C: LH 30)

Learning Outcomes

At the end of the course, students should be able to:

1. explain basic definition of Set, Subset, Union, Intersection, Complements and use of Venn diagrams;
2. solve quadratic equations;
3. solve trigonometric functions;
4. identify various types of numbers; and
5. solve some problems using Binomial theorem.

Course Contents

Elementary set theory; subset, union, intersection, complements, venn diagrams. Real numbers; Integers, Rational and Irrational numbers, mathematical, induction, Sequences and Series, Theory of Quadratic equations, Binomial theorem. Complex numbers; Algebra of complex numbers; the Argand Diagram. De-Moivre's theorem, nth roots of unity, Circular measure, Trigonometric functions of angles of any magnitude, addition and factor formulae.

PHY 101: General Physics I (Mechanics)

(2 Units C: LH 30)

Learning Outcomes

At the end of this course, students should be able to:

1. identify and deduce the physical quantities and their units;
2. differentiate between vectors and scalars;
3. describe and evaluate motion of systems on the basis of the fundamental laws of mechanics;
4. apply Newton's laws to describe and solve simple problems of motion;
5. evaluate work, energy, velocity, momentum, acceleration, and torque of moving or rotating objects;
6. explain and apply the principles of conservation of energy, linear and angular momentum;
7. describe the laws governing motion under gravity; and
8. explain motion under gravity and quantitatively determine behaviour of objects moving under gravity.

Course Contents

Space and Time, Frames of Reference, Invariance of physical laws, Relativity of simultaneity, Relativity of time intervals, relativity of length, units and dimension; standards and units, unit consistency and conversions. Kinematics, Vectors and vector addition, Components of vectors, Unit vectors, Products of vectors. Displacement, Time and average velocity, instantaneous velocity, average acceleration, motion with constant acceleration, freely falling bodies, position and velocity vectors, acceleration vector, projectile motion. Motion in a circle and Relative velocity. Fundamental laws of mechanics: forces and interactions, Newton's first law, Newton's second law, Mass and weight, Newton's third law. Statics and dynamics: application of Newton's laws, dynamics of particles, frictional forces, dynamics of circular motion. Galilean invariance, universal gravitation, gravitational potential energy, elastic potential energy, conservative and non-conservative forces. Work and energy, kinetic energy and the work-energy theorem, power, momentum and impulse, conservation of momentum, collisions and momentum conservation, elastic collisions, centre of Mass. Rotational dynamics and angular momentum, angular velocity and acceleration, energy in rotational motion, parallel axis theorem, torque, torque and rotation



about a moving axis, simple harmonic motion and its applications. The simple pendulum, damped oscillations, forced oscillations and resonance.

PHY 102: General Physics II (Electricity & Magnetism)

(2 Units C: LH 30)

Learning Outcomes

At the end of this course, students should be able to:

1. describe the electric field and potential, and related concepts, for stationary charges;
2. calculate electrostatic properties of simple charge distributions using Coulomb's law, Gauss's law and electric potential;
3. describe and determine the magnetic field for steady and moving charges;
4. determine the magnetic properties of simple current distributions using Biot-Savart and Ampere's law;
5. describe electromagnetic induction and related concepts, and make calculations using Faraday and Lenz's laws;
6. explain the basic physical of Maxwell's equations in integral form;
7. evaluate DC circuits to determine the electrical parameters; and
8. determine the characteristics of ac voltages and currents in resistors, capacitors, and Inductors.

Course Contents

Forces in nature. Electrostatics; electric charge and its properties, methods of charging. Coulomb's law and superposition. electric field and potential. Gauss's law. Capacitance. Electric dipoles. Energy in electric fields. Conductors and insulators, current, voltage and resistance. Ohm's law and analysis of DC circuits. Magnetic fields. Lorentz force. Biot-Savart and Ampère's laws. magnetic dipoles. Dielectrics. Energy in magnetic fields. Electromotive force. Electromagnetic induction. Self and mutual inductances. Faraday and Lenz's laws. Step up and step-down transformers: Maxwell's equations. Electromagnetic oscillations and waves. AC voltages and currents applied to inductors, capacitors, resistance, and combinations.

PHY 107: General Experimental Physics I

(1 Units C: PH 45)

Learning Outcomes

At the end of this course, students should be able to:

1. conduct measurements of some physical quantities;
2. make observations of events, collect and tabulate data;
3. identify and evaluate some common experimental errors;
4. plot and analyse graphs; and
5. draw conclusions from numerical and graphical analysis of data.



Course Contents

This introductory course emphasises quantitative measurements, the treatment of measurement errors and graphical analysis. A variety of experimental techniques should be employed. The experiments include studies of meters, the oscilloscope, mechanical systems, electrical and mechanical resonant systems, light, heat, viscosity etc., covered in PHY 101 and PHY 102. However, emphasis should be placed on the basic physical techniques for observation, measurements, data collection, analysis and deduction.

PHY 108: General Practical Physics II

(1 Unit C: PH 45)

Learning Outcomes

At the end of this course, the student should be able to:

1. conduct measurements of some physical quantities;
2. make observations of events, collect and tabulate data;
3. identify and evaluate some common experimental errors;
4. plot and analyse graphs;
5. draw conclusions from numerical and graphical analysis of data; and
6. prepare and present practical reports.

Course Contents

This practical course is a continuation of PHY 107 and is intended to be taught during the second semester of the 100 level to cover the practical aspect of the theoretical courses that have been covered with emphasis on quantitative measurements. The treatment of measurement errors, and graphical analysis. However, emphasis should be placed on the basic physical techniques for observation, measurements, data collection, analysis and deduction.

PHY 108: General Practical Physics II

(1 Unit C: PH 45)

Learning Outcomes

At the end of this course, the student should be able to:

1. conduct measurements of some physical quantities;
2. make observations of events, collect and tabulate data;
3. identify and evaluate some common experimental errors;
4. plot and analyse graphs;
5. draw conclusions from numerical and graphical analysis of data; and
6. prepare and present practical reports.

Course Contents

This practical course is a continuation of PHY 107 and is intended to be taught during the second semester of the 100 level to cover the practical aspect of the theoretical courses that have been covered with emphasis on quantitative measurements. The treatment of measurement errors, and graphical analysis. However, emphasis should be placed on the basic physical techniques for observation, measurements, data collection, analysis and deduction.



200 Level

GST 212: Philosophy, Logic and Human Existence

(2 Units C: LH 30)

Learning Outcomes

A student who has successfully gone through this course should be able to:

1. state the basic features of philosophy as an academic discipline;
2. identify the main branches of philosophy & the centrality of logic in philosophical discourse;
3. appreciate the elementary rules of reasoning;
4. distinguish between valid and invalid arguments;
5. think critically and assess arguments in texts, conversations and day-to-day discussions;
6. critically assess the rationality or otherwise of human conduct under different existential conditions;
7. develop the capacity to extrapolate and deploy expertise in logic to other areas of knowledge; and
8. guide his or her actions, using the knowledge and expertise acquired in philosophy and logic.

Course Contents

Scope of philosophy; notions, meanings, branches and problems of philosophy. Logic as an indispensable tool of philosophy. Elements of syllogism, symbolic logic— the first nine rules of inference. Informal fallacies, laws of thought, nature of arguments. Valid and invalid arguments, logic of form and logic of content — deduction, induction and inferences. Creative and critical thinking. Impact of philosophy on human existence. Philosophy and politics, philosophy and human conduct, philosophy and religion, philosophy and human values, philosophy and character molding and many others.

ENT 211: Entrepreneurship and Innovation

(2 Units C: LH 30)

Learning Outcomes

At the end of this course, students should be able to:

1. explain the concepts and theories of entrepreneurship, intrapreneurship, opportunity seeking, new value creation, and risk taking;
2. state the characteristics of an entrepreneur;
3. analyse the importance of micro and small businesses in wealth creation, employment, and financial independence;
4. engage in entrepreneurial thinking;
5. identify key elements in innovation;
6. describe stages in enterprise formation, partnership and networking including business planning;
7. describe contemporary entrepreneurial issues in Nigeria, Africa and the rest of the world; and
8. state the basic principles of e-commerce.



Course Contents

Concept of Entrepreneurship (Entrepreneurship, Intrapreneurship/Corporate Entrepreneurship). Theories, rationale and relevance of Entrepreneurship (Schumpeterian and other perspectives, Risk-Taking, Necessity and opportunity-based entrepreneurship and Creative destruction). Characteristics of Entrepreneurs (Opportunity seeker, Risk taker, Natural and Nurtured, Problem solver and change agent, Innovator and creative thinker). Entrepreneurial thinking (Critical thinking, Reflective thinking, and Creative thinking). Innovation (Concept of innovation, Dimensions of inn Knowledge and innovation). Enterprise formation, partnership and networking (Basics of Business Plan, Forms of business ownership, Business registration and Forming alliances and joint ventures). Contemporary Entrepreneurship Issues (Knowledge, Skills and Technology, Intellectual property, Virtual office, Networking). Entrepreneurship in Nigeria (Biography of inspirational Entrepreneurs, Youth and women entrepreneurship, Entrepreneurship support institutions, Youth enterprise networks and Environmental and cultural barriers to entrepreneurship). Basic principles of e-commerce. Ovation. Change and innovation.

ANA 201: Anatomy of Upper and Lower Limbs

(2 Units C: LH 15; PH 45)

Learning Outcomes

At the end of the course student will be able to:

1. define fundamental anatomical terminology and discuss the anatomical position;
2. describe the anatomy of the musculoskeletal system, including the axial skeleton; appendicular skeleton, appendicular and axial muscles, and arthrology;
3. describe the general features of the bones of the upper and lower limbs;
4. identify the major muscles of the upper and lower limbs;
5. explain the types and structure of the joints of the upper and lower limbs;
6. correlate between the attachment of the muscles and their functions on the different joints;
7. identify the major nerves of the upper and lower limbs;
8. describe the functional components of each of the major nerves and its distribution;
9. identify and describe the course of the major superficial veins of the upper and lower limbs; and
10. name the major arteries of the upper and lower limbs.

Course Contents

Descriptive terms, planes and terms of relationship of the human body, terms of comparison, attachment of muscles, types of muscles, movements of joints. Osteology, principles of kinesiology, general organisation of body system. Cutaneous innervation of the upper limb; pectoral region; breast; axilla; shoulder region; arm and cubital fossa; flexor compartment of forearm; extensor compartment of forearm; hand; venous and lymphatic drainage of the upper limb. Applied anatomy of nerves; blood supply of the upper limb. Cutaneous innervation of the lower limb; femoral triangle; adductor canal and medial side of the thigh; gluteal region; back of the thigh, popliteal fossa; extensor compartment of the leg and dorsum of the foot; peroneal and flexor compartment of the leg; sole of the foot, arches of the foot; mechanism of walking; venous and lymphatic drainage of the lower limb; applied anatomy of the nerves and blood supply to the lower limb.



BCH 201: General Biochemistry**(2 Units C: LH 30)****Learning Outcomes**

At the end of the course, student will be able to:

1. explain the structure of different macromolecules in biological system;
2. identify types of chemical reactions involving these macromolecules;
3. explain the various methods of isolation of these macromolecules;
4. estimate the effects of acids and alkalis on the macromolecules;
5. describe purification of macromolecules; and
6. discuss quantification of various macromolecules.

Course Contents

Introductory chemistry of amino acids; their properties, reactions and biological functions. Classification of amino acids: neutral, basic and acidic; polar and non-polar; essential and non-essential amino acids. Peptides. Introductory chemistry and classification of proteins. Biological functions of proteins. Methods of their isolation, purification and identification. Primary, secondary, tertiary and quaternary structures of proteins. Basic principles of tests for proteins and amino acids. Introductory chemistry of carbohydrates, lipids and nucleic acids. Nomenclature of nucleosides, and nucleotides; effects of acid and alkali on hydrolysis of nucleic acids.

BCH 216: Biochemistry Practical for Medical Students**(2 Units C: PH 90)****Course contents**

Chemistry of biomolecules. Acids-bases and pH balance. Buffers. Chemistry of amino acids. carbohydrates, proteins and lipids and integration of metabolism. TCA cycle, electron transport and oxidative phosphorylation. Lipids and nucleic acids, structure and function of proteins will be practically demonstrated in the laboratory.

PIO 201: Introductory Physiology and Blood**(2 Units C: LH 30)****Learning Outcomes**

At the end of the course student will be able to:

1. describe the composition of a cell membrane;
2. explain how a potential difference across a membrane will influence the distribution of a cation and an anion;
3. describe how transport rates of certain molecules and ions are accelerated by specific membrane transport proteins;
4. distinguish between active (primary and secondary) transport, facilitated diffusion, and passive diffusion based on energy source and carrier protein involvement;
5. identify the mechanisms and role of selective transporters for amino acids, neurotransmitters, nutrients; and
6. explain the general concepts of homeostasis and the principles of positive and negative feedback in physiological systems;
7. identify the site of erythropoietin production, the stimulus for its release, and the target tissue for erythropoietin action;
8. discuss the normal balance of red blood cell synthesis and destruction, including how imbalances in each lead to anemia or polycythemia;
9. list and differentiate the various types of leukocytes;



10. describe the role of thrombocytes in haemostasis; and
11. list clotting factors and the discuss the mechanism of anti-coagulants.

Course Contents

Introduction and history of physiology. Structure and functions of cell membranes. Transport process. Special transport mechanism in amphibian bladder, kidney, gall bladder, intestine, astrocytes and exocrine glands. Biophysical principles. Homeostasis and control systems including temperature regulation. Biological rhythms. Composition and functions of blood. Haemopoiesis. WBC and differential count. Plasma proteins Coagulation, fibrinolysis and platelet functions. Blood groups – ABO system – Rh system. Blood transfusion – indication for collection and storage of blood, hazards of blood transfusions. Reticulo- endothelial system. Immunity and immodeficiency disease and HIV.

PHA 201: General Pharmacology

(2 Units C: LH 30)

Learning Outcomes

At the end of the course students will be able to:

1. explain the history of pharmacology;
2. demonstrate understanding of drug interaction in the human body system;
3. explain the effects of disease on drug kinetics;
4. demonstrate understanding of relationship between drug and aging;
5. explain the effect of drugs in pregnancy;
6. explain common allergic reactions to different drugs; and
7. explain common medications used for different diseases or ill conditions.

Course Contents

History of Pharmacology and its development. Introduction to pharmacokinetics; drug absorption and bioavailability. Drug metabolism, pharmaco-genetics. Effects of disease on drug kinetics. Drug in pregnancy and the extreme age. Pharmacodynamics; dose-response relationships, LD₅₀ ED₅₀ and TD₅₀. Therapeutic index; introduction of new drugs, clinical trials; adverse drug reactions and adverse reaction surveillance. Routes of drug administration. Basic principles of pharmacokinetics. Absorption, distribution and biotransformation of drugs. Drug reception interactions. Non-Steroidal Anti-inflammatory Drugs (NSAID). Muscle relaxants, sedatives and analgesic agents. Anti-hypertensive drugs. Bronchodilators and many others.

MCB 204: Introduction to Microbiology & Infection Control

(2 Units C: LH 30)

Learning Outcomes

At the end of the course, students should be able to:

1. describe common disease causing microorganisms and their various classifications;
2. explain various types of infections-fungal, bacterial, viral and parasitic;
3. explain the role of bacterial pathogenesis;
4. identify the role of acquired and innate immune systems at preventing infections;
5. explain how infections causes diseases and break through body's immune system;
6. demonstrate infection control practices in clinics/wards;
7. demonstrate skills in standard precautions such as wearing of infection prevention gowns, lab coats, hand gloves, nose masks; and
8. explain the chain of infections and how to create a sterile environment in the clinic.



Course Contents

Scope of microbiology, historical approach to infections and its control, classifications and nomenclature of microorganisms. Introduction to the microbial world, Introduction to bacteriology, mycology, virology and parasitology (the protozoans). Disinfection and sterilisation. Nature and acquired resistance to infection. Determination of innate immunity, deep/superficial tissue infections. Fungal infections: deep and systemic mycosis, perichondral/cartilaginous/osseous infections. Hospital associated infections.

ANA 202: Histology of Basic Tissues

(2 Units C: LH 15; PH 45)

Learning Outcomes

At the end of the course, students should be able to:

1. name common current histological techniques;
2. enumerate the principles, techniques and functional applications of Histology;
3. define and explain the cell in relation to its environment, surface components and content;
4. explain the interrelationship and interdependency between cell structures and functions; and
5. identify the microscopic appearance of tissues such as muscle, cartilage, etc in relation to their staining.

Course Contents

Introduction to histology; Method of study in histology; Cell Membrane, Cellular organelles; Cell dynamics and cell cycle. Cytogenetics. Histochemistry and cytochemistry. Introduction to recombinant DNA; In situ hybridisation histochemistry. Cell dynamics and cycle. Basic tissues of the body, the epithelial, connective tissues, muscle and nervous tissue. The microanatomy of the four basic tissues, namely: epithelial tissue, including glandular tissue, connective tissue, muscular tissue, and nervous tissue. Covering and Lining Epithelia. Glandular Epithelia. Connective tissue. Bone, Bone formation and Joints. Blood. Muscle. Nervous tissue (PNS). Nervous tissue (CNS). Cardiovascular system. Respiratory system. Integumentary system. Liver, Gallbladder and Pancreas. Gastro-intestinal system. Lymphatic tissue and the Immune system. Endocrine system. Urinary system. Female reproductive system. Male reproductive system. Eye.

ANA 204: Anatomy of Thorax, Abdomen, Pelvis & Perineum (2 Units C: LH 15; PH 45)

Learning Outcomes

At the end of the course, students will be able to:

1. identify the bones and bony markings of the thorax, abdomen, pelvis and perineum;
2. list the nine regions and four quadrants and the principal organs and structures that lie deep to them and which can be palpated in those regions;
3. describe the muscular components of the anterior abdominal wall, blood supply and innervation of the anterior abdominal wall;
4. identify the arteries, veins and lymphatics of the thorax, abdomen, pelvis and perineum; be able to list the main branches of the aorta and their territories; and describe the disposition of the main veins in the abdomen;
5. describe the parts, position, vertebral levels and surface markings of the stomach and duodenum as well as the position, vertebral levels and surface markings of the pancreas, spleen, liver and gall bladder;



6. describe the greater and lesser omenta and the lesser sac;
7. describe the disposition of the jejunum and ileum; describe the surface anatomy of the caecum, ascending colon, transverse colon, descending colon and sigmoid colon;
8. describe the anatomy of the pelvic diaphragm, its midline raphe, perineal body, attachment points and the structures passing through it in males and females;
9. describe the anatomy of the ischio-anal fossa;
10. describe the anatomy and relations of the ovary, uterine tubes, uterus, cervix and vagina, including their peritoneal coverings;
11. describe the anatomy and neurovascular supply of the clitoris, vulva and vagina; the anatomy of the urogenital diaphragm and perineal 'pouches';
12. describe the origin, course and distribution of the pudendal nerves and the sites of pudendal nerve block;
13. describe the lymphatic drainage of the foregut, pelvic and perineal organs;

Course Contents

Introduction to the trunk; thoracic cage; intercostal space; thoracic cavity; pleural cavities; lungs; mediastinum general; anterior & superior mediastinum; middle; mediastinum – heart and pericardium; heart – applied anatomy; posterior mediastinum. General anatomy of abdomen and abdominal regions; anterior abdominal wall muscles; inguinal canal – inguinal and femoral hernias; peritoneal cavity and spaces; abdominal oesophagus, stomach, duodenum, spleen, small intestine, large intestine, appendix; portal venous system; portocaval anastomoses; liver and gallbladder. Pancreas and biliary apparatus; kidneys, suprarenal glands, and ureters; diaphragm; posterior abdominal wall; aorta and inferior vena cava; posterior abdominal wall muscles; lumbosacral plexus; bony and ligamentous pelvis; pelvic diaphragm (floor); male reproductive organs; female reproductive organs; male and female external genitalia; perineum; rectum and anal canal; pelvic blood vessels; abdomino-pelvic nervous system.

ANA 203: General and Systemic Embryology

(2 Units C: LH 30)

Learning Outcomes

At the end of the course, students will be able to:

1. explain how the embryo is formed from the zygote;
2. discuss the role of cleavage and gastrulation in animal development;
3. demonstrate; understanding of embryology and significance of prenatal diagnostic methods;
4. describe structural features of primordia in tissue and organs at different developmental stages;
5. define risk periods in histo- and organogenesis; and
6. analyse the most often observed developmental anomalies.



Course Contents

Spermatogenesis, oogenesis; ovarian follicles; ovulation; corpus luteum; menstruation; uterine cycle; hormonal control of uterine cycle; fertilization; cleavage; implantation; reproductive technologies-IVF/surrogacy/embryo transfer; embryo manipulation & potency/twinning; molecular embryology and transgenesis; gastrulation; notochord, neurulation; derivatives of the germ layers; folding of the embryo; fetal membranes; placenta; development of limbs and teratology. Growth and perinatology; congenital malformations – general introduction. The cardiovascular system, skin, structure of the nails and hair. Macrophagic system; cellular immunology; lymphoid organs; glands – endocrine and exocrine. Respiratory system. Digestive system. Urinary and genital systems. Electron micrograph studies of each organ.

PIO 203 : Physiology of Excitable Tissues

(2 Units C: LH 30)

Learning Outcomes

At the end of the course, students will be able to:

1. list the steps in excitation-contraction coupling in skeletal muscle;
2. describe the structure of the neuromuscular junction;
3. list some intracellular factors that can cause muscle fatigue;
4. describe the distinguishing characteristics of multi-unit and unitary smooth muscles;
5. explain the steps in the excitation-contraction coupling mechanism in cardiac muscle and compare with skeletal muscle including different mechanisms for sarcoplasmic reticulum calcium release;
6. explain how the resting membrane potential is generated
7. state the Nernst equation, and indicate how this equation accounts for both the chemical and electrical driving forces that act on an ion;
8. discuss the mechanisms by which an action potential is propagated along both nonmyelinated and myelinated axons;
9. describe the principle of the voltage clamp and how it is used to identify the ionic selectivity of channels; and
10. discuss the disorders that can occur at the neuromuscular junction.

Course Contents

Physiology of Excitable Tissues: Physiology of excitable tissues: definition and types. Nerve: membrane potentials, receptor potential, action potential and its propagation, synapses and synaptic transmission, neuromuscular junction. Muscles: types and mode of contraction in various types. General organisation of the CNS and Physiologic anatomy of the ANS. Functions of the ANS. Differences and Similarities between ANS and somatic nervous system. Divisions of the ANS. Characteristics of the sympathetic and the parasympathetic system. Similarities and differences. ANS effects on major organs of the body, Pharmacology of ANS, ANS reflexes and Control centres. Experiments on nerves and muscles.



300 Level

GST 312: Peace and Conflict Resolution

(2 Units C: LH 30)

Learning Outcomes

At the end of the course, students should be able to:

1. analyse the concepts of peace, conflict and security;
2. list major forms, types and root causes of conflict and violence;
3. differentiate between conflict and terrorism;
4. enumerate security and peace building strategies; and
5. describe roles of international organisations, media and traditional institutions in peace building.

Course Contents

Concepts of Peace, Conflict and Security in a multi-ethnic nation. Types and Theories of Conflicts. Ethnic, Religious, Economic, Geo-political Conflicts. Structural Conflict Theory, Realist Theory of Conflict, Frustration-Aggression Conflict Theory. Root causes of Conflict and Violence in Africa: Indigene and settlers Phenomenon; Boundaries/boarder disputes. Political disputes. Ethnic disputes and rivalries. Economic Inequalities. Social disputes. Nationalist Movements and Agitations. Selected Conflict Case Studies – Tiv-Junkun; Zango Kataf, Chieftaincy and Land disputes and many others. Peace Building, Management of Conflicts and Security: Peace & Human Development. Approaches to Peace & Conflict Management --- (Religious, Government, Community Leaders and many others). Elements of Peace Studies and Conflict Resolution: Conflict dynamics assessment Scales: Constructive & Destructive. Justice and Legal framework: Concepts of Social Justice; The Nigeria Legal System. Insurgency and Terrorism. Peace Mediation and Peace Keeping. Peace & Security Council (International, National and Local levels) Agents of Conflict resolution – Conventions, Treaties Community Policing: Evolution and Imperatives. Alternative Dispute Resolution, ADR. Dialogue b) Arbitration c) Negotiation d) Collaboration and many others. Roles of International Organisations in Conflict Resolution. (a). The United Nations, UN and its Conflict Resolution Organs. (b) The African Union & Peace Security Council (c) ECOWAS in Peace Keeping. Media and Traditional Institutions in Peace Building. Managing Post-Conflict Situations/Crisis: Refugees. Internally Displaced Persons, IDPs. The role of NGOs in Post-Conflict Situations/Crisis .

ENT 312 : Venture Creation

(2 Units C: LH 15; PH 45)

Learning Outcomes

At the end of this course, students, through case study and practical approaches, students should be able to:

1. describe the key steps in venture creation;
2. spot opportunities in problems and in high potential sectors regardless of geographical location;
3. state how original products, ideas, and concepts are developed;
4. develop business concept for further incubation or pitching for funding;
5. identify key sources of entrepreneurial finance;
6. implement the requirements for establishing and managing micro and small enterprises;
7. conduct entrepreneurial marketing and e-commerce;



8. apply a wide variety of emerging technological solutions to entrepreneurship; and
9. appreciate why ventures fail due to lack of planning and poor implementation.

Course Contents

Opportunity Identification (Sources of business opportunities in Nigeria, Environmental scanning, Demand and supply gap/unmet needs/market gaps/Market Research, unutilised resources. Social and climate conditions and Technology adoption gap). New business development (business planning, market research). Entrepreneurial Finance (Venture capital, Equity finance, Micro finance, Personal savings. Small business investment organisations and Business plan competition). Entrepreneurial marketing and e-commerce (Principles of marketing, Customer Acquisition & Retention, B2B, C2C and B2C models of e-commerce. First Mover Advantage, E-commerce business models and Successful E-Commerce Companies,). Small Business Management/Family Business: Leadership & Management, Basic book keeping, Nature of family business and Family Business Growth Model. Negotiation and Business communication (Strategy and tactics of negotiation/bargaining, Traditional and modern business communication methods). Opportunity Discovery Demonstrations (Business idea generation presentations. Business idea Contest, Brainstorming sessions, Idea pitching). Technological Solutions (The Concept of Market/Customer Solution, Customer Solution and Emerging Technologies, Business Applications of New Technologies - Artificial Intelligence (AI). Virtual/Mixed Reality (VR). Internet of Things (IoTs), Blockchain, Cloud Computing, Renewable Energy and many other. Digital Business and E-Commerce Strategies).

APT 301: Principles of Diseases and Pathology

(2 Units C: LH 30)

Learning objectives:

To provide the student with pathological basis of diseases that are commonly seen in clinical practice.

Learning Outcomes

At the end of the course, students should be able to:

1. describe the aetiology and pathogenesis of disease processes; and
2. describe the pathological processes that lead to changes in diseased organs and tissues how these relate to clinical signs and symptoms.

Course Contents

The normal cell and the adopted cell, cell injury and cell death, introductory general and systemic pathology, characteristics and classification of diseases of various body systems such as cardiovascular (hypertension, angina pectoris and other vascular diseases, cardiac arrhythmia and heart failures), endocrinological and highlight the organisational functions, hypophyseal hormones and pineal gland, ACTH, insulin, glucagon, parathyroid, sex hormones, pregnancy and lactation; body's reaction to disease-inflammation, immunity and immunological and genetic factors in disease, adverse drug reactions. Pathology (pathophysiology, disease processes to a stage 1 tertiary standard) to include a basic principle and understanding of pathology including the role of micro-organisms in health and disease. Chronic and infectious diseases (such as fungal, viral and parasitic), deficiency diseases, protein-calorie malnutrition, vitamins and mineral deficiency, endocrine, metabolic, neurological and emotional diseases. Neoplasia; diverse drug reactions as well as the clinical aspects.



Introductory general and systemic pathology – characteristics and classification of diseases inflammation, wounds, respiratory system, alimentary system, kidneys and urinary tract system, and many others. Consideration of the pathophysiology of infectious and chronic diseases as well as cancer.

CPY 311: Introductory to Immunology

(2 Units C: LH 30)

Learning objectives:

This course seeks to introduce students to the basic principles of the mammalian immune system and the various immunological disorders which do arise.

Learning Outcomes

At the end of the course, students should be able to:

1. describe the general principles of natural immunity;
2. explain the defensive mechanisms in the mammalian body;
3. explain immunological disorders; and
4. appreciate the essence of immunisation.

Course Contents

Immunity; definition and classification. General principles of natural immunity. Phagocytosis, acquired immunity (active and passive), antigens. Chemical nature of antigens. Structure and formation of antibodies. Antigen-antibody reactions Bacterial Exotoxins and endotoxins. Significance of toxoids in active immunity. Immunological disorders: introduction to T and B cells. HIV/AIDS and the immune system. MHC proteins or (transplantation antigens), immune tolerance Hypersensitivity reactions, Autoimmunity. Immunisation.

CPY 302: Introductory Chemical Pathology

(2 Units C: LH 30)

Learning Outcomes

At the end of the course, students should be able to:

1. describe chemical pathology;
2. demonstrate knowledge of the bio-chemical basis of disease states;
3. select relevant biochemical tests that will confirm or refute provisional clinical diagnosis of disease states; and
4. interpret and apply these results in deciding therapy and follow up of these disease states.

Course Contents

What is Chemical Pathology? Objectives of the course; Instruments used in Chemical Pathology; Collection of Specimens; Interpretation of Results; Point of Care Testing (PCT)- Side-room Tests; Sodium Metabolism: hyponatraemia, hypernatraemia- cause, effects, clinical situations and features. Clinical significance. Potassium metabolism. Water deficiency and excess. Aldosteronism. Diabetes insipidus. Acid-base Balance. Respiratory and metabolic disturbances. Acidosis; Alkalosis. Principles of treatment of acid-base disturbances and many others. Renal Function: Glomerular dysfunction. Tubular dysfunction. Proteinuria. Nephrotic syndrome. Renal failure Investigation. Renal calculi. Gastrointestinal Tract: Gastric function, peptic ulcer, Zollinger-Ellison syndrome, carcinoma of the stomach. Malabsorption Syndromes. Differential diagnosis of generalised intestinal and pancreatic malabsorption. Pernicious anaemia. The Pancreas: acute pancreatitis, diagnosis, tests of function. The Liver: Disorders of bile pigment metabolism,



Classification of jaundice, Basic processes in liver disease, cholestasis. Acute hepatitis and chronic hepatitis. Cirrhosis. Haemolytic jaundice. Congenital hyperbilirubinemia. Neonatal jaundice (and drugs). Gallstones - formation and consequence of gallstones. Disorders of Carbohydrate Metabolism: Blood glucose, glycosuria, ketonuria, ketosis, lactic acidosis. Diabetes mellitus: clinical and laboratory features, diagnosis, glucose tolerance test, types of glucose tolerance curves. Diagnosis of diabetes; acute metabolic complications - diabetic comas; keto-acidosis, hyperosmolar non-ketotic coma, hypoglycaemic coma. Investigation of a diabetic presenting in coma. Hypoglycaemia: causes, insulinoma. hypoglycaemia in children.

CAM 302: Introduction to Osteopathy

(2 Units C: LH 30)

Learning Objectives: This course seeks to introduce students to:
Philosophy and theory of osteopathy

Learning Outcomes

At the end of the course, students should be able to:

1. explain the theory and principles of osteopathy; and
2. demonstrate techniques used in osteopathy.

Course Contents

Osteopathic philosophy and theory, Comparative techniques and listing systems. General Osteopathic techniques. Advanced Manual Therapy Techniques. Functional Rehabilitation-exercise Physiology, Physiological Therapeutics-modalities, Minor Surgery, Medical Therapeutics

CAM 305: Introduction to Chiropractic

(2 Units C: LH 30)

Learning Outcomes

At the end of the course, students should be able to:

1. define chiropractic practice;
2. state the history of chiropractic practice; and
3. discuss the philosophy of chiropractic practice.

Course Contents

Definition of Chiropractic, Brief history of chiropractic, Philosophy guiding chiropractic practice. Terminology: Adjustment. Biomechanics. Chiropractic. Fixation. Joint manipulation Joint mobilisation. Neuromusculoskeletal. Palpation. Posture. Spinal manipulative therapy. Subluxation. Thrust. Nutrition in Chiropractic.

CAM 310: Introduction to Naturopathy

(2 Units C: LH 30)

Learning Outcomes

At the end of the course, students should be able to:

1. apply clinical skills in the care of patients to the standards of a primary care naturopathic physician as defined by the profession;
2. apply the philosophy and principles of naturopathic medicine in the care of patients; and
3. apply evidence-informed practice efficiently and effectively in patient-care settings.



Course Contents

Fundamentals of Naturopathy: Students are introduced to the history of natural medicine. Principles/ origin of natural medicine and concepts. Natural therapies and their effects on body's physiology. Psychophysiological aspects in health and diseases are explained. Holistic principles in disease and health are expounded. Duties expected of a naturopathic physician. Hydrotherapy: The effective use of Hydrotherapy. Comprehensive understanding of diseases and the healing processes that are initiated with Hydrotherapy. Methods of administering water therapy including; hot water bath, cold water bath, hot and cold water therapy, sitz bath, cryotherapy and many others. The effect of varying temperature of water in different diseases.

CAM 317: Introduction to Homeopathy

(2 Units C: LH 30)

Learning Outcomes

At the end of the course, students should be able to:

1. describe homeopathy pharmacy;
2. discuss pharmacology and pharmacognosy of homeopathy;
3. describe the mechanism of action of homeopathic remedies;
4. explain homeopathic remedies; and
5. apply homeopathy in patient care.

Course Contents

Homeopathic Materia Medica. Remedies: original and nomenclature/kingdoms. Polycryst remedies. Study of 10 remedies in each kingdom. Homeopathy pharmacy. Analytical methods by use of thin layer chromatography (TCL). Control study by violet absorption spectrum method. The dilution and the vibration of succession techniques. Mechanisms of action of homeopathic remedies. Pharmacology and Pharmacognosy of homeopathy. Homeopathy in clinical practice. Case history. Current illness. Personal and family history. Psychosocial history. Clinical examination. Laboratory investigation. Homeopathic remedies. General remedy finder. Duration of the homeopathic result. Duration and outcome of treatment. The clinical application of homeopathy. Epidemics. Diseases of cardiovascular system. Disease of respiratory system. Disease of gastrointestinal system. Disease of endocrine system. Disease of urinary system. Orthopaedic disorder. Disease of connective tissues. Disease of the skin. Venereal disorder. Neurological diseases. Gynaecological disease. Paediatric disease and many others.

CAM 318: Traditional Chinese Medicine II

(2 Units C: LH 30)

Learning Outcomes

At the end of the course, students should be able to:

1. explain advances in therapeutic procedures in TCM.

Course Contents

Outline of TCM therapeutic procedures. Gain familiarity with the practice of TCM and Acupuncture



CAM 302: Naturopathy II

(2 Units C: LH 30)

Learning objectives: This course seeks to introduce students to: Clinical Nutrition and botanical medicine.

Learning Outcomes

At the end of the course, students should be able to:

1. explain the nutritional approach to the prevention and treatment of diseases;
2. describe how to carry out a nutritional assessment on a patient; and
3. describe the actions of medicinal plants (nervines, hepatic, anodynes, antispasmodic and many others) and their uses in correcting various organ dysfunctions.

Course Contents

Clinical Nutrition: A nutritional approach to the prevention and treatment of diseases. The importance of homeostasis. Prevention and treatment of specific disease conditions with nutrition. How to carry out a nutritional assessment on a patient. Nutritional diseases affecting major organ systems in the body. Management and treatment of diseases using superfoods, enzymes, vitamins, minerals, amino acids, plant supplements, orthomolecular remedies and many others.

Botanical Medicine: In-depth study of therapeutic herbalism. Actions of medicinal plants (nervines, hepatic, anodynes, antispasmodic and many others) and their uses in correcting various organ dysfunctions, Medicinal constituents of plants (tannins, glycosides, terpenoids, flavonoids and many others), Pharmacognosy, specific indications, contraindications as well as toxicity and dosing criteria for medicinal plants. The study of herb-herb interaction. Herb compounding and dispensing skills especially in polypharmacy.

400 Level

CAM 414: Policy, Laws & Ethics in Complementary and Alternative Medicine (3 Units C: LH 45)

Learning Outcomes

At the end of the course, students should be able to:

1. state laws and ethics guiding the practices that relates with medical practices;
2. interpret and apply the laws and ethics guiding the practice of Complementary and Alternative Medicine in Nigeria.
3. state rights of practitioner, patients and general public consumers.

Course Contents

Laws and ethics guiding the practice relates with other medical practices. Federal acts. National policy on traditional medicine, poisons and pharmacy act. Counterfeit and Fake drugs (Miscellaneous provisions Act.) Pharmacist Ethics, Codes of Conduct for Complementary and Alternative Medicine practitioners, the National Agency for Food Drugs Administration (NAFDAC) Decree, National Drug Law Enforcement Agency (NDLEA) decree. Indian Hemp decree, State Board Laws in Complementary and Alternative Medicine practice. Medical and Pharmacy laws and professional ethic. General comportment, malpractices and excesses of HMPs as well as any other mandatory legal requirements and restrictions on the following: claims faking quackery, sales, advertisement, control of manufacture, distribution, marketing labelling, registration,



importation and exportation of Complementary and Alternative Medicine products, animal medicinal products and mineral medicinal products. Miscellaneous regulations and other directives of the proposed Traditional Medicine Council of Nigeria (TMCN) which may be formulated and promulgated from time to time. Discussions of ethical issues confronting professional responsibilities and their patient in the practice of Complementary and Alternative Medicine. Rights of the practitioner, patients and the general public consumers.

CAM 413: Research Methodology

(3 Units C: LH 45)

Learning Outcomes

At the end of the course, students should be able to:

1. identify research problems;
2. describe what literature search and review entail;
3. describe different research designs and sampling methods; and
4. describe the process of investigating a research problem.

Course Contents

Rudiments of research methodology and its application to the public health field. Basic learning of the following aspects: research problem definition, research questions, research and null hypothesis theoretical-conceptual formulation of research problems. Review of related literature, basic research designs. Methods of research observations, measurement of variables, data analytic techniques, interpretation of research findings. Includes study of randomisation techniques, epidemiologic research designs and controlled clinical trials.

CAM 404: Public Health in Complementary and Alternative Medicine (2 Units C: LH 30)

Learning Outcomes

At the end of the course, the students should be able to:

1. appreciate the concept of Public Health;
2. demonstrate skill in taking epidemiological data and interpreting same;
3. explain the basic principles of disease transmission and control; and
4. apply the knowledge of fundamental concepts and principles in the sciences to health issues.

Course Contents

Concept of Public Health and Health System. Definition of Public Health and areas of application, how man has responded to health problems, Model of a natural health system, Analysis of National Health System, Statements on the development of Health Systems.

Introduction to Epidemiology. Infectious disease Process. Natural History of Disease and levels of prevention. Epidemic and Endemic Disease. Classification of Disease. Measuring Health and Disease. Measures of Disease Frequency. Measures of Association. Public Health Measures. Sources of Health Data. Clinical trials and Complementary and Alternative Medicine. Control of Communicable/Non-communicable Diseases. Control of selected Diseases – Malaria, Guinea worm, STDs/HIV – AIDS, Onchocerciasis, Tuberculosis, Rabies and Anthrax. Gender and Health. Social Interaction and Social Behaviour in Health. Health Education and Promotion. Definition, Focus on Basic Concepts and Principles of Health Education/Promotion; Understanding Human Behaviour. Man-Environment interaction process and its Public Health Importance Demography. Scope and Objective of Demography. Population Census. Demographic Sample Surveys. Errors in



Demographic Data. Age and Sex Composition, Population Policies and Programmes in Nigeria. Migration and Population Distribution. The concept and element of the environment of man. Planning, organisation, monitoring and evaluation of health systems. Synergy between orthodox and traditional medicine. Concept of referral networking.

CAM 424: Project

(6 Units C: PH 270)

Learning Outcomes

At the end of the course, Students should be able to:

1. develop a hypothesis, formulate and execute a working plan; and
2. interpret and give scientific reports.

Course contents

Project may be Laboratory – based or dissertations / long essays and may be done in groups. Projects will deal with topics of interest on various aspects of Complementary and Alternative Medicine including the practice, medicinal plants, formulations, and effectiveness and toxicity studies. Students are expected to present a project report and defend it in partial fulfilment for the award of the degree.

Minimum Academic Standards

Equipment

Herbal/pharmacognosy laboratory

1. Assorted heating mantles
2. Microscopes
3. Drying oven
4. Refractometer
5. Colorimeter
6. pH meters
7. Distilled water still
8. Ultra-microtome
9. Mortars and pestles (glass)
10. Centrifuge (bench)
11. Melting point apparatus
12. Freeze dryer
13. Hot plates
14. Fridge
15. Combined hot plate magnetic stirrer
16. TLC adjustable spreader
17. TLC Chromatography tanks (20 x 20)
18. Microscopes
19. UV Spectrophotometer
20. Assorted Soxhlet apparatus
21. Fractional distillation assembly
22. Museum equipment and furniture
23. Miscellaneous glassware
24. Rotary evaporator



25. Fume cupboard
26. High performance liquid chromatography (HPLC)
27. Gas chromatography (GC)
28. Gel imaging apparatus

Instruments for Osteopathy

1. Foam roller
2. Massage ball and Peanuts
3. Wheat bag
4. Golf ball
5. Rolling pin
6. An inflatable exercise ball
7. High-velocity low-amplitude (HVLA)
8. Springing techniques
9. Muscle energy technique
10. Soft tissue techniques
11. Strain-counterstrain techniques
12. Facilitated positional release
13. Still technique
14. Cranial osteopathy
15. Lymphatic techniques

Tools and Equipment used in Chiropractic Care

1. Chiropractic Adjustment Tables
 - a. Flexion Tables
 - b. Elevation Tables
 - c. Hi-lo Tables
 - d. Stationary Tables
 - e. Decompression Tables
2. Chiropractic Adjustment Tools
3. Electrical stimulation
4. Full Body Vibration Plate
5. Foam Rollers
6. Ultrasound
7. Cold Laser
8. Activator Adjusting Tool
9. TENS Machine
10. Cryochamber/Cryosauna
11. Impulse Adjusting Instrument
12. Pro-Adjuster
13. Tense Machine
14. Cold Closer

Instruments for Acupuncture

1. massage table or chair
2. auriculotherapy device
3. acu-magnets
4. essential oils and herbs
5. ZYTO technology



6. electroacupuncture device
7. gua sha
8. laser therapy
9. cupping
10. stainless steel balls
11. pressure studs
12. magnets
13. needles
14. electrotherapy
15. sound & Vibration Therapy
16. models

Instruments for Homeopathy

1. Pile Tiles
2. Porcelain dishes
3. Crucibles with tongs
4. Pestles and mortars
5. Water bath, metal/electric
6. Microscope
7. Glass apparatus for filtration with vacuum
8. Thin layer chromatography apparatus
9. Ph meter
10. Stop watch
11. Hydrometer
12. Alcoholometer
13. Lactometer
14. Electric potentiometer
15. Electric triturator
16. Water still (Distilled water plant)
17. Percolator
18. Macerator
19. Botanical slides
20. Colorimeter
21. Spectro Scope
22. Dissecting Microscope
23. Distillation apparatus
24. Pyknometer
25. Electronic balance
26. Hot air oven
27. Chemical Balance
28. Physical balance
29. Chemical balance
30. Measuring glasses

Tools used in Naturopathic and Integrative Health

1. Nutrition
2. Exercise & Lifestyle Modification
3. Stress/Relaxation Techniques



4. Herbal Supplements
5. Homeopathic Remedies
6. Emotional Energy Balancing
7. Essential Oils
8. Dietary Supplements
9. Functional Lab Testing
10. Energy Therapies
11. Kinesiology
12. Reiki – Healing Energy
13. Lifestyle Counseling
14. Biotherapeutic Drainage
15. Botanical Medicine
16. Chinese Medicine
17. Natural Childbirth

Staffing

Resource Requirements and Personnel

a) Academic Staff

The staff/student ratio is specified under different categories of staff. This will provide the necessary student/staff contact to enhance the learning process especially with the clinical core of the programme which follows after the relevant pre-requisite laboratory classes' exposure.

General considerations for academic staff

The minimum number of teachers to start a Complimentary and Alternative Medicine Programme shall be in accordance with the requirements for commencing an academic programme.

1. all teachers involved in the programme must contribute to and be familiar with it apart from being involved in the machinery for planning and reviewing the programme;
2. staff should include persons experienced both in teaching and in providing patient care with appropriate balance to provide the desired spectrum of knowledge;
3. academic Staff for the programme must be holders of Ph.D. degrees provided that staff with lower qualification can be accommodated under the staff development programme. However, staff with Ph.D. should not be less than 70% of total staff on ground;
4. staff assignments and expectations should provide for a balance of teaching, service, research and administrative responsibility;
5. based on students' enrolment, the minimum academic staff-students ratio should be 1:15;
6. however, there should be a minimum of six full-time equivalent of Staff in each department. There is need to have a reasonable number of Staff with higher degrees as well as sufficient professional experience. With a minimum load of 18 Units per semester for students and a minimum of six full-time equivalent of staff in each programme, staff should have a maximum of 15 contact hours per week for lectures, tutorials, practicals and supervision of projects;
7. full time academic staff should have a second degree minimum primarily to ensure adequate acceptance of the concept goals and objectives of the degree programme; and
8. for Graduate Assistants or Teaching Assistants, a minimum first degree is required. This category of staff is not considered suitable to teach and therefore not counted during any evaluation exercise.

The following are the recommended minimum academic staff mix:

Professors/Readers 20%

Senior Lecturer 35%

Allied Health Sciences



Lecturer I and below 45%

Library Resources

There should be a Faculty and Departmental Library, with appropriate reference books, journals and periodicals in all areas of Complementary and Alternative Medicine. A functional e-Learning facility with wireless internet access is highly recommended.

Classrooms, Laboratories and Office Spaces

Classroom

The standard requirement of 0.65m² per full-time student should be maintained. Thus the minimum total space requirement for a faculty or department shall be the product of its total full time equivalent student enrolment (FTE) and the minimum space requirement per full-time equivalent i.e. (FTE) 0.65m².

Office

In this respect, each academic staff should have an office space of at least 25 square metres taking into cognisance the status/cadre of the staff

In addition, there should be for the Faculty, a Dean's office and for each Department a Head of Department's office with attached offices for their supporting staff as specified below in m²:

| | | |
|----------------------------------|---|-------|
| Professor's office | - | 18.50 |
| Head of Department's office | - | 18.50 |
| Tutorial teaching staff's office | - | 13.50 |
| Other teaching staff space | - | 7.00 |
| Technical staff space | - | 7.00 |
| Secretarial space | - | 7.00 |
| Staff research laboratory | - | 16.50 |
| Seminar Space/per student | - | 1.85 |
| Laboratory space (per student) | - | 7.50 |

Others

Store room for chemicals 40-50m²

Work rooms/Preparatory 40-50m²

Post graduate teaching laboratories 40-50m²

Balance rooms 10m²

Laboratories for teaching and research 50-180m²

Specialise Work Rooms (such as Extraction, sterilisation, Aseptic and Instrument) 50m²

Animal house 30m²

Faculty library and Reference room 130m²

Lecture Theatres (for 150 students) 160m²

Plant room 30m²

Cold rooms 30m²

Herbarium 40m²

Student common room 140m²

Staff common room 55m²

Dispensing practice area 20m²

Medicinal plant garden





B.Sc Dental Technology

Overview

Dental Technology is the technical side of dentistry where a dental technologist, on prescription of a dentist, makes any prosthesis or appliance for the head and neck region. This could consist of; Complete dentures, partial dentures, crowns and bridges, and implant-supported dentures in various materials such as acrylics, alloys, and ceramics; Removable orthodontic appliances consisting of springs and retainers in acrylic bases for the movement of teeth. Mouthguards to protect against sports injuries; Maxillofacial appliances such as artificial eyes, ears, and facial prostheses that may be required after surgical treatment. Implant prostheses such as implant-retained overdenture, implant-retained bridges, and single implant-retained crowns.

Dental technologists do not have direct contact with patients, instead, they work in a dental laboratory where various prosthetic appliances are custom made. Dental technologists can be thought of as artists who, with a thorough understanding of dental materials science, use their artistic skills to fabricate the form, colour and function of individual teeth or maxillofacial prostheses for a patient. The fact that the product can affect the health and appearance of a person demands of the technician a high level of responsibility and accuracy.

Philosophy

The philosophy of the programme is to produce Dental Technologists with the sound knowledge and technical skills necessary for a career in Dental Technology, along with the theoretical and philosophical foundation required to support professionalism, independent thought, personal responsibility, and decision-making process with due recognition of the leading role of the Dental Surgeons (Dentists) in the practice of the profession.

Objectives

The general objective of the programme is to produce Dental Technologists with the knowledge and skills required to design and fabricate dental appliances. The emphasis on practical laboratory work helps prepare students for employment in the dental technology profession while offering an authentic approach to learning.

The specific objectives include:

1. to provide a dental technology education suited to the needs of students and employers and to enable the students to attain the requisite competencies needed to practice within their professional limits;
2. to enable students to comply with systems and processes to support safe patient care and work within industry/professional standards, while developing an awareness of and responsibility for safe working practices;
3. to promote a challenging academic environment to foster student interest and study in applying the principles of dental technology, biomedical, and material sciences;
4. to provide inspirational teaching supported by scholarly activity and research;
5. to develop an evidence-based approach to learning, professional practice, and decision making;
6. to foster the development of subject-specific and transferable skills, including self-awareness, personal responsibility, communication, and interpersonal skills;



7. to promote critically reflective practitioners on the ethical, social, and economic implications of professional decisions in dental technology;
8. to prepare students both in and for employment, further study, research for lifelong learning;
9. To realise the important role of dental technologists as major partners in the dental profession;
10. to work along with the dentists in creating dental awareness in our developing economy;
11. to inculcate enough professional knowledge to enable them to be involved in research activities that can lead to better service provision; and
12. to have the capability to undertake independent practice within the limits of the professional training and help in employment generation.

Unique Features of the Programme

The unique feature of this programme compared to similar programmes in other top Universities in the world are:

1. Incorporation of courses on Biomaterials which is fundamental to the understanding of the science underpinning material processing and fabrication; and
2. completion of all laboratory courses before the SIWES programme.

Employability Skills

The skills that are emphasised in this curriculum are; Competencies in the design and fabrication of all Removable and fixed Prosthodontic appliances, Design and fabrication of all Orthodontic Appliances, Fabrication of all Maxillofacial Prosthodontic appliances, Design, and fabrication of occlusal appliances used in the treatment of Temporomandibular joint disorders and sports prostheses, Communication skills, and information dissemination.

21stCentury Skills

1. Collaboration and team work
2. Creativity and imagination.
3. Critical thinking.
4. Problem solving.
5. Flexibility and adaptability.
6. Information Literacy.
7. Leadership.
8. Civic literacy and citizenship.
9. Social responsibility.
10. Technology literacy.
11. Initiative.



Admission and Graduation Requirements

Basic Admission Requirements

There are two different pathways by which candidates can be admitted into the programmes in the discipline: The five-year programme and the Direct Entry.

Five-Year Programme Degree

Candidates seeking enrolment into the B.Sc. Dental Technology programme must have obtained a minimum of five Senior Secondary Certificate (SSC) credit passes (at not more than two sittings) including Mathematics, Physics, Chemistry, Biology and English Language.

Direct Entry

HSC/GCE A/LEVEL passes in two relevant subjects with SSC credit passes in Chemistry and three other subjects from among these: Biology, Physics, English Language and Mathematics at not more than two sittings.

Holders of National Diploma (ND) certificate with minimum of upper credit pass are eligible for admission into 200 level provided that their programme covers certain basic courses offered in the school up to the second year.

Holders of HND with minimum of lower credit pass are eligible for admission into 300 level depending on the appropriateness of their requisite academic preparation.

In addition to fulfilling the requirements in (ii) above, a holder of OND (ND) and / or HND must also have five SSC credit passes including English, Biology, Chemistry, Physics and Mathematics.

Graduation Requirements and Award of B.Sc. Dental Technology Degree

To be eligible for the award of B.Sc. degree, a student must have passed all the prescribed courses and satisfy the professional conduct as required for registration with the Dental Technology Registration Board of Nigeria. In addition, the candidate must have a CGPA of not less than 1.0



Global Course Structure

100 Level

| Course Code | Course Title | Unit(s) | Status | LH | PH |
|-------------|--------------------------------|-----------|--------|----|----|
| GST 111 | Communication in English | 2 | C | 15 | 45 |
| GST 112 | Nigerian Peoples & Culture | 2 | C | 30 | - |
| BIO 101 | General Biology I | 2 | C | 30 | - |
| BIO 102 | General Biology II | 2 | C | 30 | - |
| BIO 107 | General Biology Practical I | 1 | C | - | 45 |
| BIO 108 | General Biology Practical II | 1 | C | - | 45 |
| CHM 101 | General Chemistry I | 2 | C | 30 | - |
| CHM 102 | General Chemistry II | 2 | C | 30 | - |
| CHM 107 | General Chemistry Practical I | 1 | C | - | 45 |
| CHM 108 | General Chemistry Practical II | 1 | C | - | 45 |
| MTH 101 | Elementary Mathematics 1 | 2 | C | 30 | - |
| PHY 101 | General Physics I | 2 | C | 30 | - |
| PHY 102 | General Physics II | 2 | C | 30 | - |
| PHY 107 | General Physics Practical I | 1 | C | - | 45 |
| PHY 108 | General Physics Practical II | 1 | C | - | 45 |
| | Total | 24 | | | |

200 Level

| Course Code | Course Title | Unit(s) | Status | LH | PH |
|-------------|--|-----------|--------|----|----|
| GST 212 | Philosophy, Logic and Human Existence | 2 | C | 30 | - |
| ENT 211 | Entrepreneurship and Innovation | 2 | C | 30 | - |
| ANA 201 | Anatomy of Upper and Lower Limbs | 2 | C | 15 | 45 |
| POI 201 | Introductory Physiology and Blood | 2 | C | 30 | - |
| DNT 201 | Introduction Dental Material Science I | 2 | C | 30 | - |
| DNT 203 | Introduction to Dental Technology I | 2 | C | 30 | - |
| DNT 205 | Oral Anatomy | 2 | C | 30 | - |
| ANA 202 | Histology of Basic Tissues | 2 | C | 15 | 45 |
| DNT 202 | Introduction Dental Material Science II | 2 | C | 30 | |
| DNT 206 | Oral Physiology | 2 | C | 30 | - |
| DNT 203 | Introduction to Dental Technology II Safety, Health, and care of Laboratory equipment | 2 | C | 30 | - |
| DNT 207 | Dental Laboratory Techniques I | 1 | C | | 45 |
| | Total | 23 | | | |



300 Level

| Course Code | Course Title | Unit(s) | Status | LH | PH |
|--------------------|---|----------------|---------------|-----------|-----------|
| GST 312 | Peace and Conflict Resolution | 2 | C | 30 | - |
| ENT 312 | Venture Creation | 2 | C | 15 | 45 |
| DNT 301 | Removable Prosthodontics and Techniques I | 2 | C | 30 | - |
| DNT 303 | Dental Laboratory for Removable Prosthodontics & Techniques I | 2 | C | - | 90 |
| DNT 305 | Metallurgy and Casting Process | 2 | C | 30 | - |
| DNT 307 | Principles of Dental Aesthetics and Occlusion | 2 | C | 30 | - |
| DNT 302 | Removable Prosthodontics & Techniques II | 2 | C | 30 | - |
| DNT 304 | Dental Laboratory Techniques for Removable Prosthodontics & Techniques II | 2 | C | - | 90 |
| DNT 306 | Fixed Prosthodontics and Techniques I | 2 | C | 30 | - |
| DNT 308 | Dental Laboratory Techniques for Fixed Prosthodontics | 2 | C | - | 90 |
| DNT 309 | Ceramics in dental technology. | 2 | C | 30 | |
| | Total | 22 | | | |

400 Level Courses

| Course Code | Course Title | Unit(s) | Status | LH | PH |
|--------------------|---|----------------|---------------|-----------|-----------|
| DNT 401 | Fixed prosthodontic Technique II | 2 | C | 30 | - |
| DNT 403 | Introduction to orthodontic Techniques | 2 | C | 30 | - |
| DNT 405 | Introduction to Maxillofacial prosthodontics techniques | 2 | C | 30 | - |
| HST 403 | Research Methodology | 2 | C | 30 | - |
| DNT 413 | Biostatistics | 2 | C | 30 | - |
| SIW 400 | Students Industrial Works Experience Scheme (SIWES) | 6 | C | - | 270 |
| | Total | 16 | | | |



500 Level

| Course Code | Course Title | Unit(s) | Status | LH | PH |
|-------------|---|-----------|--------|----|----|
| DNT 503 | Digital Prosthodontics | 2 | C | 30 | - |
| DNT 505 | Orthodontic Dental Laboratory Technique | 2 | C | | 45 |
| DNT 507 | Orthodontic Technology I | 2 | C | 30 | - |
| DNT 509 | Maxillo-Facial Technology | 2 | C | 30 | - |
| DNT 501 | Biomedical Devices Design | 2 | C | 30 | - |
| DNT 502 | Research Project | 4 | C | - | 60 |
| DNT 504 | Professional Ethics and Jurisprudence | 2 | C | 15 | - |
| DNT 506 | Orthodontic Technology II | 2 | C | 30 | - |
| DNT 508 | Maxillo-facial Technology II | 2 | C | | 30 |
| DNT 512 | Implantology in Dental Technology | 2 | C | 30 | - |
| | Total | 22 | | | |

Course Contents and Learning Outcomes

GST 111: Communication in English

(2 Units C: LH 15; PH 45)

Learning Outcomes

At the end of this course, students should be able to:

1. identify possible sound patterns in English language;
2. list notable language skills;
3. classify word formation processes;
4. construct simple and fairly complex sentences in English;
5. apply logical and critical reasoning skills for meaningful presentations;
6. demonstrate an appreciable level of the art of public speaking and listening; and
7. write simple and technical reports.

Course Contents

Sound patterns in English Language (vowels and consonants, phonetics and phonology). English word classes (lexical and grammatical words, definitions, forms, functions, usages, collocations). Sentence in English (types: structural and functional, simple and complex). Grammar and Usage (tense, mood, modality and concord, aspects of language use in everyday life). Logical and Critical Thinking and Reasoning Methods (Logic and Syllogism, Inductive and Deductive Argument and Reasoning Methods, Analogy, Generalisation and Explanations). Ethical considerations, Copyright Rules and Infringements. Writing Activities: (Pre-writing, Writing, Post writing, Editing and Proofreading; Brainstorming, outlining, Paragraphing, Types of writing, Summary, Essays, Letter, Curriculum Vitae, Report writing, Note making and many others. Mechanics of writing). Comprehension Strategies: (Reading and types of Reading, Comprehension Skills, 3RsQ). Information and Communication Technology in modern Language Learning. Language skills for effective communication. Major word formation processes. Writing and reading comprehension strategies. Logical and critical reasoning for meaningful presentations. Art of public speaking and listening.



GST 112: Nigerian Peoples and Culture

(2 Units C: LH 30)

Learning Outcomes

At the end of the course, students should be able to:

1. analyse the historical foundation of the Nigerian culture and arts in pre-colonial times;
2. list and identify the major linguistic groups in Nigeria;
3. explain the gradual evolution of Nigeria as a political unit;
4. analyse the concepts of Trade, Economic and Self-reliance status of the Nigerian peoples towards national development;
5. enumerate the challenges of the Nigerian State towards Nation building;
6. analyse the role of the Judiciary in upholding people's fundamental rights;
7. identify acceptable norms and values of the major ethnic groups in Nigeria; and
8. list and suggest possible solutions to identifiable Nigerian environmental, moral and value problems.

Course Contents

Nigerian history. culture and art up to 1800 (Yoruba. Hausa and Igbo peoples and culture; peoples and culture of the ethnic minority groups). Nigeria under colonial rule (advent of colonial rule in Nigeria; Colonial administration of Nigeria). Evolution of Nigeria as a political unit (amalgamation of Nigeria in 1914; formation of political parties in Nigeria; Nationalist movement and struggle for independence). Nigeria and challenges of nation building (military intervention in Nigerian politics; Nigerian Civil War). Concept of trade and economics of self-reliance (indigenous trade and market system; indigenous apprenticeship system among Nigeria people; trade. skill acquisition and self-reliance). Social justices and national development (law definition and classification. Judiciary and fundamental rights. Individual. norms and values (basic Nigeria norms and values. patterns of citizenship acquisition; citizenship and civic responsibilities; indigenous languages. usage and development; negative attitudes and conducts. Cultism. kidnapping and other related social vices). Re-orientation. moral and national values (The 3R's – Reconstruction. Rehabilitation and Re-orientation; Re-orientation Strategies: Operation Feed the Nation (OFN). Green Revolution. Austerity Measures. War Against Indiscipline (WAI). War Against Indiscipline and Corruption (WAIC). Mass Mobilisation for Self-Reliance. Social Justice and Economic Recovery (MAMSER). National Orientation Agency (NOA). Current socio-political and cultural developments in Nigeria.

BIO 101: General Biology I

(2 Units C: LH 30)

Learning Outcomes

At the end of lectures in Plant Biology, students should be able to:

1. explain cell structure and organisations;
2. summarise functions of cellular organelles;
3. characterise living organisms and state their general reproduction;
4. describe the interrelationship that exists between organisms;
5. discuss the concept of heredity and evolution; and
6. enumerate habitat types and their characteristics.



Course Contents

Cell structure and organisation. Functions of cellular organelles. Characteristics and classification of living things. Chromosomes, genes their relationships and importance. General reproduction. Interrelationships of organisms (competitions, parasitism, predation, symbiosis, commensalisms, mutualism, saprophytism); heredity and evolution (introduction to Darwinism and Lamarkism. Mendelian laws. Explanation of key genetic terms), elements of ecology and types of habitats.

BIO 102: General Biology II

(2 Units C: LH 30)

Learning Outcomes

At the end of the lectures in Introductory Ecology, students should be able to:

1. list the characteristics, methods of identification and classification of viruses, bacteria and fungi;
2. state the unique characteristics of plant and animal kingdoms;
3. describe ecological adaptations in the plant and animal kingdom;
4. give a summary of the physiology of plants and animals;
5. explain nutrition, respiration, excretion and reproduction in plants and animals; and
6. describe growth and development in plants and animals.

Course Contents

Basic characteristics, identification and classification of viruses, bacteria and fungi. A generalised survey of the plant and animal kingdoms based mainly on the study of similarities and differences in the external features. Ecological adaptations. Briefs on physiology to include nutrition, respiration, circulatory systems, excretion, reproduction, growth and development.

BIO 107: General Biology Practical I

(1 Unit C: PH 45)

Learning Outcomes

At the end of the course, students should be able to:

1. outline common laboratory hazards;
2. provide precautions on laboratory hazards;
3. state the functions of the different parts of microscope;
4. use the microscope and describe its maintenance;
5. draw biological diagrams and illustrations; and
6. apply scaling and proportion to biological diagrams.

Course Contents

Common laboratory hazards: prevention and first aid; measurements in biology; uses and care of microscope: compound and dissecting microscope. Biological drawings and illustration, scaling, accuracy and proportion; use of common laboratory apparatus and laboratory experiments designed to illustrate the topics covered in BIO 101.

BIO 108: General Biology Practical II

(1 Unit C: LH 45)

Learning Outcomes

At the end of the course, students should be able to:

1. describe the anatomy of flowering plants;
2. differentiate types of fruit and seeds;
3. state ways of handling and caring for biological wares;



4. describe the basic histology of animal tissues; and
5. identify various groups in the animal kingdom.

Course Contents

Anatomy of flowering plants, primary vegetative body: stem, leaf and root to show the mature tissues namely parenchyma, collenchyma, sclerenchyma, xylem and phloem. Types of fruits and seeds. Care and use of dissecting kits and other biological wares. Dissection and general histology of animal tissues based on vertebrate forms. Morphology and functions of epithelial, muscular, nervous and connective tissues. Examination of various groups of lower invertebrates under microscopes, identification of various groups of organisms in Animal Kingdom. And any experiment designed to emphasise the practical aspects of topics in BIO 102

CHM 101: General Chemistry I

(2 Units C: LH 30)

Learning Outcomes

At the end of this course, the students should be able to:

1. define atom, molecules and chemical reactions;
2. discuss the modern electronic theory of atoms;
3. write electronic configurations of elements on the periodic table;
4. rationalise the trends of atomic radii, ionization energies, electronegativity of the elements based on their position in the periodic table;
5. identify and balance oxidation – reduction equation and solve redox titration problems;
6. draw shapes of simple molecules and hybridised orbitals;
7. identify the characteristics of acids, bases and salts, and solve problems based on their quantitative relationship;
8. apply the principles of equilibrium to aqueous systems using le chatelier's principle to predict the effect of concentration, pressure and temperature changes on equilibrium mixtures;
9. analyse and perform calculations with the thermodynamic functions, enthalpy, entropy and free energy; and
10. determine rates of reactions and its dependence on concentration, time and temperature.

Course Contents

Atoms, molecules, elements and compounds and chemical reactions. Modern electronic theory of atoms. Electronic configuration, periodicity and building up of the periodic table. Hybridisation and shapes of simple molecules. Valence Forces; Structure of solids. Chemical equations and stoichiometry; Chemical bonding and intermolecular forces, kinetic theory of matter. Elementary thermochemistry; rates of reaction, equilibrium and thermodynamics. Acids, bases and salts. Properties of gases. Redox reactions and introduction to electrochemistry. Radioactivity.



CHM 102: General Chemistry II

(2 Units C: LH 30)

Learning Outcomes

At the end of this course, the students should be able to:

1. state the importance and development of organic chemistry;
2. define fullerenes and its applications;
3. discuss electronic theory;
4. determine the qualitative and quantitative of structures in organic chemistry;
5. state rules guiding nomenclature and functional group classes of organic chemistry;
6. determine rate of reaction to predict mechanisms of reaction;
7. identify classes of organic functional group with brief description of their chemistry;
8. discuss comparative chemistry of group 1a, iia and iva elements; and
9. describe basic properties of transition metals.

Course Contents

Historical survey of the development and importance of Organic Chemistry; Fullerenes as fourth allotrope of carbon. uses as nanotubes. nanostructures. nanochemistry. Electronic theory in organic chemistry. Isolation and purification of organic compounds. Determination of structures of organic compounds including qualitative and quantitative analysis in organic chemistry. Nomenclature and functional group classes of organic compounds. Introductory reaction mechanism and kinetics. Stereochemistry. The chemistry of alkanes, alkenes, alkynes, alcohols, ethers, amines, alkyl halides, nitriles. Aldehydes, ketones, carboxylic acids and derivatives. The Chemistry of selected metals and non-metals. Comparative chemistry of group IA, IIA and IVA elements. Introduction to transition metal chemistry.

CHM 107: General Chemistry Practical I

(1 Unit C: PH 45)

Learning Outcomes

At the end of this course, the students should be able to:

1. state the general laboratory rules and safety procedures;
2. collect scientific data and correctly carrying out chemical experiments;
3. identify the basic glassware and equipment in the laboratory;
4. identify the differences between primary and secondary standards;
5. perform redox titration;
6. recording observations and measurements in the laboratory notebooks; and
7. analyse the data to arrive at scientific conclusions.

Course Contents

Laboratory experiments designed to reflect topics presented in courses CHM 101 and CHM 102. These include acid-base titrations. qualitative analysis. redox reactions. gravimetric analysis. data analysis and presentation.

CHM 108: General Chemistry Practical II

(1 Unit C: PH 45)

Learning Outcomes

At the end of this course, the students should be able to:

1. identify the general laboratory rules and safety procedures;
2. collect scientific data and correctly carrying out chemical experiments;



3. identify the basic glassware and equipment in the laboratory;
4. identify and carry out preliminary tests which includes ignition, boiling point, melting point, test on known and unknown organic compounds;
5. perform solubility tests on known and unknown organic compounds;
6. conduct elemental tests on known and unknown compounds; and
7. conduct functional group/confirmatory test on known and unknown compounds which could be acidic / basic / neutral organic compounds.

Course Contents

Continuation of CHM 107. Additional laboratory experiments to include functional group analysis, quantitative analysis using volumetric methods.

MTH 101: Elementary Mathematics I (Algebra and Trigonometry) (2 Units C: LH 30)

Learning Outcomes

At the end of this course students should be able to:

1. explain basic definition of Set, Subset, Union, Intersection, Complements and use of Venn diagrams;
2. solve quadratic equations;
3. solve trigonometric functions;
4. identify various types of numbers; and
5. solve some problems using Binomial theorem.

Course Contents

Elementary set theory, subsets, union, intersection, complements, venn diagrams. Real numbers, integers, rational and irrational numbers. Mathematical induction, real sequences and series. Theory of quadratic equations. Binomial theorem. Complex numbers. Algebra of complex numbers. The Argand diagram. De-Moivre's theorem, nth roots of unity. Circular measure, trigonometric functions of angles of any magnitude, addition and factor formulae.

PHY 101: General Physics I (Mechanics)

(2 Units C: LH 30)

Learning Outcomes

At the end of this course, the students should be able to:

1. identify and deduce the physical quantities and their units;
2. differentiate between vectors and scalars;
3. describe and evaluate motion of systems on the basis of the fundamental laws of mechanics;
4. apply newton's laws to describe and solve simple problems of motion;
5. evaluate work, energy, velocity, momentum, acceleration, and torque of moving or rotating objects;
6. explain and apply the principles of conservation of energy, linear and angular momentum;
7. describe the laws governing motion under gravity; and
8. explain motion under gravity and quantitatively determine behaviour of objects moving under gravity.



Course Contents

Space and time. units and dimension. Vectors and Scalars. Differentiation of vectors: displacement. velocity and acceleration. kinematics. Newton laws of motion (Inertial frames. Impulse. force and action at a distance. momentum conservation). Relative motion. Application of Newtonian mechanics. Equations of motion. Conservation principles in physics. Conservative forces. Conservation of linear momentum. Kinetic energy and work. Potential energy. System of particles. Centre of mass. Rotational motion. Torque. vector product. Moment. Rotation of coordinate axes and angular momentum. Polar coordinates. conservation of angular momentum. Circular motion. Moments of inertia. gyroscopes and precession. Gravitation: Newton's Law of Gravitation. Kepler's Laws of Planetary Motion. Gravitational Potential Energy. Escape velocity. Satellites motion and orbits.

PHY 102: General Physics II (Electricity & Magnetism)

(2 Units C: LH 30)

Learning Outcomes

At the end of this course, the students should be able to:

1. describe the electric field and potential, and related concepts, for stationary charges;
2. calculate electrostatic properties of simple charge distributions using Coulomb's law, Gauss's law and electric potential;
3. describe and determine the magnetic field for steady and moving charges;
4. determine the magnetic properties of simple current distributions using Biot-Savart and Ampere's law;
5. describe electromagnetic induction and related concepts, and make calculations using Faraday and Lenz's laws;
6. explain the basic physical of Maxwell's equations in integral form;
7. evaluate DC circuits to determine the electrical parameters; and
8. determine the characteristics of ac voltages and currents in resistors, capacitors, and Inductors

Course Contents

Forces in nature. Electrostatics; electric charge and its properties, methods of charging. Coulomb's law and superposition. electric field and potential. Gauss's law. Capacitance. Electric dipoles. Energy in electric fields. Conductors and insulators, current, voltage and resistance. Ohm's law and analysis of DC circuits. Magnetic fields. Lorentz force. Biot-Savart and Ampère's laws. magnetic dipoles. Dielectrics. Energy in magnetic fields. Electromotive force. Electromagnetic induction. Self and mutual inductances. Faraday and Lenz's laws. Step up and step-down transformers: Maxwell's equations. Electromagnetic oscillations and waves. AC voltages and currents applied to inductors, capacitors, resistance, and combinations.

PHY 107: General Practical Physics I

(1 Unit C: PH 45)

Learning Outcomes

At the end of this course, the students should be able to:

1. conduct measurements of some physical quantities;
2. make observations of events, collect and tabulate data;
3. identify and evaluate some common experimental errors;
4. plot and analyse graphs; and
5. draw conclusions from numerical and graphical analysis of data.



Course contents

These introductory courses emphasise quantitative measurements. the treatment of measurement errors. and graphical analysis. A variety of experimental techniques should be employed. The experiments include studies of meters. the oscilloscope. mechanical systems. electrical and mechanical resonant systems. Light, Heat, viscosity and many others. covered in PHY 101 and PHY 102. However. emphasis should be placed on the basic physical techniques for observation. measurements. data collection. analysis and deduction.

PHY 108: General Practical Physics II

(1 Unit C: PH 45)

Learning Outcomes

At the end of this course, the student should be able to:

1. conduct measurements of some physical quantities;
2. make observations of events, collect and tabulate data;
3. identify and evaluate some common experimental errors;
4. plot and analyse graphs;
5. draw conclusions from numerical and graphical analysis of data; and
6. prepare and present practical reports.

Course Contents

This practical course is a continuation of PHY 107 and is intended to be taught during the second semester of the 100 level to cover the practical aspect of the theoretical courses that have been covered with emphasis on quantitative measurements. The treatment of measurement errors, and graphical analysis. However, emphasis should be placed on the basic physical techniques for observation, measurements, data collection, analysis and deduction.

200 Level

GST: 212 Philosophy, Logic and Human Existence

(2 Units C: LH 30)

Learning Outcomes

A student who has successfully gone through this course should be able to:

1. state the basic features of philosophy as an academic discipline;
2. identify the main branches of philosophy & the centrality of logic in philosophical discourse;
3. describe the elementary rules of reasoning;
4. distinguish between valid and invalid arguments;
5. think critically and assess arguments in texts, conversations and day-to-day discussions;
6. critically assess the rationality or otherwise of human conduct under different existential conditions;
7. develop the capacity to extrapolate and deploy expertise in logic to other areas of knowledge; and
8. guide his or her actions, using the knowledge and expertise acquired in philosophy and logic.



Course Contents

Scope of philosophy; notions, meanings, branches and problems of philosophy. Logic as an indispensable tool of philosophy. Elements of syllogism, symbolic logic— the first nine rules of inference. Informal fallacies, laws of thought, nature of arguments. Valid and invalid arguments, logic of form and logic of content — deduction, induction and inferences. Creative and critical thinking. Impact of philosophy on human existence. Philosophy and politics, philosophy and human conduct, philosophy and religion, philosophy and human values, philosophy and character molding, and many others.

ENT 211: Entrepreneurship and Innovation

(2 Units C: LH 30)

Learning Outcomes

At the end of this course, students should be able to:

1. explain the concepts and theories of entrepreneurship, intrapreneurship, opportunity seeking, new value creation, and risk taking;
2. state the characteristics of an entrepreneur;
3. analyse the importance of micro and small businesses in wealth creation, employment, and financial independence;
4. engage in entrepreneurial thinking;
5. identify key elements in innovation;
6. describe stages in enterprise formation, partnership and networking including business planning;
7. describe contemporary entrepreneurial issues in nigeria, africa and the rest of the world; and
8. state the basic principles of e-commerce.

Course Contents

Concept of Entrepreneurship (Entrepreneurship, Intrapreneurship/Corporate Entrepreneurship,). Theories. Rationale and relevance of Entrepreneurship (Schumpeterian and other perspectives. Risk-Taking. Necessity and opportunity-based entrepreneurship and Creative destruction). Characteristics of Entrepreneurs (Opportunity seeker. Risk taker. Natural and Nurtured. Problem solver and change agent. Innovator and creative thinker). Entrepreneurial thinking (Critical thinking. Reflective thinking. and Creative thinking). Innovation (Concept of innovation. Dimensions of innovation. Change and innovation. Knowledge and innovation). Enterprise formation. partnership and networking (Basics of Business Plan. Forms of business ownership. Business registration and Forming alliances and joint ventures). Contemporary Entrepreneurship Issues (Knowledge. Skills and Technology. Intellectual property. Virtual office. Networking). Entrepreneurship in Nigeria (Biography of inspirational Entrepreneurs. Youth and women entrepreneurship. Entrepreneurship support institutions. Youth enterprise networks and Environmental and cultural barriers to entrepreneurship). Basic principles of e-commerce.

ANA 201: Anatomy of Upper & Lower Limbs

(2 Units C: LH 15; PH 45)

Learning Outcomes

At the end of the course, students should be able to:

1. define fundamental anatomical terminology and discuss the anatomical position;
2. describe the anatomy of the musculoskeletal system, including the axial skeleton; appendicular skeleton, appendicular and axial muscles, and arthrology;
3. describe the general features of the bones of the upper and lower limbs;
4. identify the major muscles of the upper and lower limbs;



5. explain the types and structure of the joints of the upper and lower limbs;
6. correlate between the attachment of the muscles and their functions on the different joints;
7. identify the major nerves of the upper and lower limbs;
8. describe the functional components of each of the major nerves and its distribution;
9. identify and describe the course of the major superficial veins of the upper and lower limbs; and
10. name the major arteries of the upper and lower limbs.

Course Contents

Descriptive terms, plans and terms of relationship of the human body, terms of comparison, attachment of muscles, types of muscles, movements of joints. Osteology, Principles of Kinesiology, general organisation of body systems. Cutaneous innervations of upper limb. Pectoral region. Breast. Axilla. Shoulder region. Arm and cubital fossa. Flexor Compartment of forearm. Extensor compartment of forearm. Hand. Venous and lymphatic drainage of the upper limb. Applied anatomy of nerves. Blood supply of the upper limb. Cutaneous innervation of lower limb. Femoral triangle. Adductor canal and medial side of the thigh. Gluteal region. Back of the thigh, popliteal fossa. Extensor compartment of the leg and dorsum of the foot. Peroneal and flexor compartment of the leg. Sole of the foot, arches of the foot. Mechanism of walking. Venous and lymphatic drainage of the Lower limb. Applied anatomy of nerve and blood supply of lower limb.

ANA 202: Histology of Basic Tissues

(2 Units C: LH 15: PH 45)

Learning Outcomes

At the end of this course, students should be able to:

1. name common current histological techniques;
2. enumerate the principles, techniques and functional applications of Histology;
3. define and explain the cell in relation to its environment, surface components and content;
4. explain the interrelationship and interdependency between cell structures and functions; and
5. identify the microscopic appearance of tissues such as muscle, cartilage, etc in relation to their staining.

Course Contents

Introduction to histology; Method of study in histology; Cell Membrane, Cellular organelles; Cell dynamics and cell cycle. Cytogenetics. Histochemistry and cytochemistry. Introduction to recombinant DNA; In situ hybridization histochemistry. Cell dynamics and cycle. Basic tissues of the body, the epithelial, connective tissues, muscle and nervous tissue. The microanatomy of the four basic tissues, namely: epithelial tissue, including glandular tissue, connective tissue, muscular tissue, and nervous tissue. Covering and Lining Epithelia. Glandular Epithelia. Connective tissue. Bone, Bone formation and Joints. Blood. Muscle. Nervous tissue (PNS). Nervous tissue (CNS). Cardiovascular system. Respiratory system. Integumentary system. Liver, Gallbladder and Pancreas. Gastro-intestinal system. Lymphatic tissue and the Immune system. Endocrine system. Urinary system. Female reproductive system. Male reproductive system. Eye.



PIO 201: Introductory Physiology and Blood

(2 Units C: LH 30)

Learning Outcomes

At the end of this course, student should be able to:

1. describe the composition of a cell membrane;
2. explain how a potential difference across a membrane will influence the distribution of a cation and an anion;
3. describe how transport rates of certain molecules and ions are accelerated by specific membrane transport proteins;
4. distinguish between active (primary and secondary) transport, facilitated diffusion, and passive diffusion based on energy source and carrier protein involvement;
5. identify the mechanisms and role of selective transporters for amino acids, neurotransmitters, nutrients, etc.;
6. explain the general concepts of homeostasis and the principles of positive and negative feedback in physiological systems;
7. identify the site of erythropoietin production, the stimulus for its release, and the target tissue for erythropoietin action;
8. discuss the normal balance of red blood cell synthesis and destruction, including how imbalances in each lead to anemia or polycythemia;
9. list and differentiate the various types of leukocytes;
10. describe the role of thrombocytes in haemostasis; and
11. list clotting factors and the discuss the mechanism of anti-coagulants..

Course Contents

Introduction and history of physiology. Structure and functions of cell membranes. Transport process. Special transport mechanism in amphibian bladder, kidney, gall bladder, intestine, astrocytes and exocrine glands. Biophysical principles. Homeostasis and control systems including temperature regulation. Biological rhythms. Composition and functions of blood. Haemopoiesis. WBC and differential count. Plasma proteins Coagulation, fibrinolysis and platelet functions. Blood groups –ABO system – Rh system. Blood transfusion – indication for collection and storage of blood, hazards of blood transfusions. Reticulo- endothelial system. Immunity and immodeficiency disease and HIV.

DNT 201: Introduction to Dental Materials

(2 Units C: LH 30)

Learning Outcomes

At the end of this course, students should be able to:

1. define dental materials;
2. classify dental materials;
3. discuss the physical, mechanical, and biological properties of dental materials;
4. describe the uses, advantages, and disadvantages of these dental materials; and
5. explain the handling properties of these dental materials.



Course Contents

Scope and Need for the Course. Structure of matter. Adhesion: Physical and Chemical properties of dental materials. Measurements. and testing equipment. Biological consideration. Standardisation/Specification. International Standard Organisation. National Standard Organisations. Classification of various Dental Materials commonly used in the Dental Laboratory. their fitness for purpose concerning their molecular structures.

DNT 202: Dental Material Science 1

(2 Units C: LH 30)

Learning Outcomes

At the end of this course, students should be able to:

1. discuss the science underpinning the use of the gypsum, resins, and impression materials;
2. recognise where these materials can be used;
3. recognise different impression trays and know their advantages and limitations;
4. define shrinkages, and itemise their causes and how to ameliorate them;
5. state the uses, advantages, and disadvantages of dental wax; and
6. describe the physical properties of polishing materials and how to handle them.

Course Contents

The Science of Gypsum and Gypsum Products. Production. Chemistry of Setting: Properties of Die and Cast Materials. Manipulation. Technical consideration: - Porosity. Warpage. Shrinkage. Hygroscopic Expansion and many others. Synthetic Resins: Classification of Dental Resins: Polymerization. Types Copolymerisation. Cross Linkages. Uses in density. Other applications: soft liners. tissue conditioners. and denture cleaners. Technical Consideration: - Shrinkages. porosity crazing. and processing stresses. Impression materials: Classification of impressions. requirements of impressions materials. Impression trays: Types and uses. Classification of impression materials: elastic and non-elastic impression materials. Compositions. Properties. Requirements. and Technical considerations. Waxes: Classification. Compositions. Abrasive and Polishing materials.

DNT 203: Introduction to Dental Technology II Safety, Health and Care of Laboratory Equipment (2 Units C: LH 30)

Learning Outcomes

At the end of this course, students should be able to:

1. demonstrate knowledge and understanding of hazards in the dental laboratory;
2. explain the philosophy behind the safety and prevention of accidents in the dental laboratory;
3. discuss the handling of various laboratory instruments in the dental laboratory;
4. explain how to prevent cross-infection in the laboratory; and
5. justify the use of personal protective equipment in the dental laboratory.

Course Contents

Dental Laboratory setup. Hazards in the dental laboratory and risk control such as Physical hazards (Vibration. noise. fire. burns. sharp objects. electrocution). Chemical Hazards. (Acids. methyl/ethyl methacrylate/ monomer. Chemical dusts such as dust from gypsum acrylic and pumice). Biological hazards (Viral. bacterial and fungi infections. Ergonomic hazards and



Psychosocial hazards. Handling biospecimens and other hazardous substances such as gas, molten metals, and fumes.

DNT 204: Introduction to Dental Technology I

(2 Units C: LH 30)

Learning Outcomes

At the end of this course, students should be able to:

1. list the various specialties in dental technology;
2. explain importance of dental technology to dental health care delivery and with other members of the health care delivery team;
3. describe the various hand instruments, bench instruments in the dental laboratory; and
4. describe how cast gypsum products, make special trays, fabricate bite blocks and arrange teeth.

Course Contents

General Introduction: General definition of Dental Technology and the various branches. Removable and Fixed Prosthodontics, Orthodontics, Maxillo-Facial, and Implant prosthodontics. Students will also be exposed to digital dental technology such as CAD-CAM. The importance of Dental Technology to dental health care delivery and with other members of the Health Care Delivery Team. Basic tools and equipment used in Dental Technology Practice. Manual dexterity in the practice of Dental Technology, Arrangement of teeth. Dental formula-deciduous and permanent dentition. Principles involved in the construction of basic dental appliances – impression taking, handling and casting, model separation, trimming of models, special tray construction, duplication of models, Bite registration block making and registration.

DNT 205: Oral Anatomy

(2 Units C: LH 30)

Learning Outcomes

At the end of this course, students should be able to:

1. demonstrate knowledge and understanding of the anatomy of the oral cavity;
2. describe the gross anatomy of different types of teeth including blood and nerve supply;
3. describe the course and distribution of trigeminal nerve and mandibular nerves;
4. explain the structure of the tongue and recognise the different papillae; and
5. explain the anatomy and mode of action of the intrinsic and extrinsic muscles of the tongue.

Course Contents

Fundamentals of oral embryology and histology. The skull and associated bones including mandible, maxilla, and temporomandibular joint (TMJ), The movement of the TMJ, The muscles of facial expression and mastication including their origins and insertions, functions as well as their nerve and blood supplies. Anatomy of the open mouth including the palate the tongue, the vestibules, and denture bearing areas, The teeth, different types, their special features including deciduous and permanent dentitions, their nerve and blood supplies, the distributions of the facial and trigeminal nerves as well as the maxillary and mandibular branches of the external carotid artery. The structure of the periodontium including its function, the principal fibres, the papilla, and gingival sulcus. the salivary glands, their locations, ducts, and nerve supply. The tongue, intrinsic and extrinsic muscles movements, innervations, and functions.



DNT 206: Oral Physiology

(2 Units C: LH 30)

Learning Outcomes

At the end of this course, students should be able to:

1. discuss the causes and composition of pellicle, plaque, and calculus;
2. demonstrate knowledge and understanding of tooth formation and tooth emergence;
3. explain the various disruptions that may occur during tooth formation and emergence;
4. highlight age changes in pulp, enamel, and dentine;
5. describe the composition, characteristics, and functions of saliva; and
6. explain the principles behind mastication and deglutition.

Course Contents

The organic and inorganic composition of enamel, dentine, cementum, bone and their comparison. factors which affect calcium and phosphorus metabolism. Tooth formation amelogenesis and odontogenesis, including the enamel organ and tooth germ, eruption and shedding of teeth. Age changes in the tooth including the pulp. Saliva composition. characteristics and functions. Tooth deposits including material alba. Dental plaque and dental calculus. The formation. classification and comparison of plaque and calculus. Dental stains – intrinsic and extrinsic exogenous and endogenous stains. The tongue and taste sensation including distribution of the four basic taste. Mastication and deglutition and the roles played by the teeth, lips, cheeks and the palate in chewing and swallowing. Voluntary and involuntary phases. Halitosis (oral malodour) causes and prevention.

DNT 207: Dental Laboratory Techniques I

(1 Unit C: LH 15)

Learning Outcomes

At the end of this course, students should be able to:

1. identify and describe the equipment and basic tools and their uses in dental laboratory;
2. demonstrate knowledge and skill of pouring an impression;
3. demonstrate how to do model separation from an impression, preparation of dies, and trimming of casts in the dental laboratory;
4. demonstrate practical skills in the fabrication of special trays, carving of teeth; and
5. demonstrate skills in the duplication of models and storing of casts/models.

Course Contents

Identification of equipment and basic tools and their uses in Dental Laboratory. Handling of impression. Principles and techniques of pouring of impression. Model separation and trimming. Making of dies. Materials used in the fabrication of special trays. Practical experience in the fabrication of special trays. the carving of various teeth in the mouth. Materials and methods of duplication of models.



300 Level

GST 312: Peace and Conflict Resolution

(2 Units C: LH 30)

Learning Outcomes

At the end of the course, students should be able to:

1. analyse the concepts of peace, conflict and security;
2. list major forms, types and root causes of conflict and violence;
3. differentiate between conflict and terrorism;
4. enumerate security and peace building strategies; and
5. describe roles of international organisations, media and traditional institutions in peace building.

Course Contents

Concepts of Peace. Conflict and Security in a multi-ethnic nation. Types and Theories of Conflicts: Ethnic. Religious. Economic. Geo-political Conflicts. Structural Conflict Theory. Realist Theory of Conflict. Frustration-Aggression Conflict Theory. Root causes of Conflict and Violence in Africa: Indigene and settlers Phenomenon. Boundaries/boarder disputes. Political disputes. Ethnic disputes and rivalries. Economic Inequalities. Social disputes. Nationalist Movements and Agitations. Selected Conflict Case Studies – Tiv-Junkun. Zango Kartaf. Chieftaincy and Land disputes and many others. Peace Building. Management of Conflicts and Security: Peace & Human Development. Approaches to Peace & Conflict Management --- (Religious. Government. Community Leaders and many others). Elements of Peace Studies and Conflict Resolution: Conflict dynamics assessment Scales: Constructive & Destructive. Justice and Legal framework: Concepts of Social Justice. The Nigeria Legal System. Insurgency and Terrorism. Peace Mediation and Peace Keeping. Peace & Security Council (International. National and Local levels) Agents of Conflict resolution – Conventions. Treaties Community Policing: Evolution and Imperatives. Alternative Dispute Resolution. ADR. Dialogue b). Arbitration. c). Negotiation d). Collaboration and many others. Roles of International Organisations in Conflict Resolution. (a). The United Nations. UN and its Conflict Resolution Organs. (b). The African Union & Peace Security Council (c). ECOWAS in Peace Keeping. Media and Traditional Institutions in Peace Building. Managing Post-Conflict Situations/Crisis: Refugees. Internally Displaced Persons. IDPs. The role of NGOs in Post-Conflict Situations/Crisis.

ENT 312: Venture Creation

(2 Units C: LH 15; PH 45)

Learning Outcomes

At the end of this course, students, through case study and practical approaches, should be able to:

1. describe the key steps in venture creation;
2. spot opportunities in problems and in high potential sectors regardless of geographical location;
3. state how original products, ideas, and concepts are developed;
4. develop business concept for further incubation or pitching for funding;
5. identify key sources of entrepreneurial finance;
6. implement the requirements for establishing and managing micro and small enterprises;
7. conduct entrepreneurial marketing and e-commerce;
8. apply a wide variety of emerging technological solutions to entrepreneurship; and
9. appreciate why ventures fail due to lack of planning and poor implementation.

Course Contents



Opportunity Identification (Sources of business opportunities in Nigeria. Environmental scanning. Demand and supply gap/unmet needs/market gaps/Market Research. Unutilised resources. Social and climate conditions and Technology adoption gap). New business development (business planning. market research). Entrepreneurial Finance (Venture capital. Equity finance. Micro finance. Personal savings. small business investment organisations and Business plan competition). Entrepreneurial marketing and e-commerce (Principles of marketing. Customer Acquisition & Retention. B2B. C2C and B2C models of e-commerce. First Mover Advantage. E-commerce business models and Successful E-Commerce Companies. Small Business Management/Family Business: Leadership & Management. Basic book keeping. Nature of family business and Family Business Growth Model. Negotiation and Business communication (Strategy and tactics of negotiation/bargaining. Traditional and modern business communication methods). Opportunity Discovery Demonstrations (Business idea generation presentations. Business idea Contest. Brainstorming sessions. Idea pitching). Technological Solutions (The Concept of Market/Customer Solution. Customer Solution and Emerging Technologies. Business Applications of New Technologies - Artificial Intelligence (AI). Virtual/Mixed Reality (VR). Internet of Things (IoTs). Blockchain. Cloud Computing. Renewable Energy and many others. Digital Business and E-Commerce Strategies).

DNT 301: Removable Prosthodontics and Techniques I

(2 Units C: LH 30)

Learning Outcomes

At the end of this course, students should be able to:

1. identify the types of partial dentures;
2. list the types of overdentures and flexible dentures;
3. list the stages of fabrication of partial, complete, flexible, and overdentures;
4. distinguish between the parts of partial and complete dentures;
5. distinguish the various polymers for denture bases;
6. explain the processes of fabrication of all acrylic and other polymer-based removable appliances; and
7. demonstrate how to fabricate all acrylic and polymer-based removable appliances.

Course Contents

Introduction to types of partial dentures fabricated using acrylic resin and other polymers. Aspects of complete denture prosthodontics from the fabrication of special trays. Bite blocks mounting of casts on the articulators. Types of articulators, advantages and disadvantages of each type of articulators. Face bow and face bow transfer techniques. Setting up of teeth. Processing and finishing of acrylic-based dentures. Different materials used in fabrication of flexible dentures, advantages and disadvantages of each material. The process of fabrication of partial denture in flexible denture materials and finishing. Process of fabrication of overdentures in acrylic resin materials. Relining and rebasing of dentures. Acrylic denture repairs.



DNT 302: Removable Prosthodontics and Techniques II

(2 Units C: LH 30)

Learning Outcomes

At the end of this course, students should be able to:

1. demonstrate knowledge and skill in fabricating metallic-based removable appliances;
2. demonstrate knowledge of retention, bracing, and fulcrum principles in the fabrication of partial denture designs;
3. list the components of removable partial dentures;
4. describe the process of fabrication of all removable metallic based dentures;
5. describe all the equipment and materials used in the fabrication of removable metal-based dentures;
6. interpret the design of removable partial dentures;
7. distinguish between the various metals used in the fabrication of metal-based dentures; and
8. construct all metal-based removable appliances.

Course Contents

Anatomy, physiology, design as well as safety of metal-based removable appliances. Theoretical knowledge and principles of fabrication of removable metal-based dental appliances, such as metal-based partial dentures, complete dentures, overdentures. Design of metallic prosthodontic appliance with emphasis on rests, rest seats, clasp position and approach, metallic mainframe. Combination of metallic and non-metallic denture base materials. Principles of supporting units for partial dentures – on lays, rests, hook, continuous clasps, plates, bars. The general pattern of investment procedures, wax elimination, and heat soaking, casting in various types of casting machines, trimming, polishing, and finishing.

DNT 303: Dental laboratory Techniques for Removable Prosthodontics & Techniques **(2 Units C: PH 30)**

Learning Outcomes

At the end of this course, students should be able to:

1. fabricate all resin-based removable appliances;
2. demonstrate the safe use of rotary tools and dental lathes;
3. demonstrate the safe use of sharp tools, such as scalpels and carving instruments;
4. demonstrate and use infection-control techniques and apply universal safety precautions to prevent cross-contamination;
5. describe and evaluate the work process and the finished appliance;
6. analyse whether an appliance has been satisfactorily designed and constructed; and
7. apply basic principles of denture design in the fabrication of all resin-based removable dentures.

Course Contents

Skill development in provision of resin-based removable dentures to patients who have lost all or some natural teeth. starting with special trays fabrication, bite blocks, setting up of teeth, and finishing. Use of different types of articulators and how to mount casts on the articulators. Fundamental knowledge, understanding, and practical skills to apply the relevant design principles and appropriate manufacturing techniques from the receipt of a prescription and impressions to the production of removable dentures. Component designs that incorporate



features to enhance strength and modify the loading to the denture bearing area, including supporting structures. Conformity of removable prostheses to strict biological, physical.

DNT 304: Dental Laboratory Techniques for Removable Prosthodontics & Techniques (2 Units C: PH 90)

Learning Outcomes

At the end of this course, students should be able to:

1. fabricate all metal-based removable appliances;
2. demonstrate the safe use of rotary tools and dental lathes;
3. demonstrate the safe use of sharp tools, such as scalpels and carving instruments;
4. demonstrate and use infection-control techniques and apply universal safety precautions to prevent cross-contamination;
5. describe and evaluate the work process and the finished appliance;
6. analyse whether an appliance has been satisfactorily designed and constructed;
7. apply basic principles of denture design in the fabrication of all metal-based removable dentures; and
8. interpret the prescription by a dentist for the design of a prosthetic appliance.

Course Contents

Provision of metal-based removable dentures to patients who have lost all or some natural teeth. Surveying, denture designs and construction of different classes of partial dentures, and incorporation of different parts and fitting of such appliances. Relevant design principles and appropriate manufacturing techniques from the receipt of a prescription and impressions to the production of removable dentures. Component designs that incorporate features to enhance strength and modify the loading to the denture bearing area, including supporting structures. Conformity of removable prostheses to strict biological, physical.

DNT 305: Metallurgy and Casting Process

(2 Units C: LH 30)

Learning Outcomes

At the end of this course, students should be able to:

1. list the types of dental metallic materials;
2. outline the types of casting machines;
3. apply the knowledge of the properties of metals and the casting technique in the fabrication of metallic based dentures;
4. apply the principles of casting in the fabrication of metallic dentures; and
5. demonstrate the skill required in the casting process.

Course Contents

Historical development of metallic materials in dentistry, the metallurgy of dental metallic materials, production of dental metallic materials. Classification of metallic dental materials. Properties of metallic dental materials, – corrosion resistance, thermal conductivity, tarnishing, dimensional changes, malleability, ductility, impact strength, fatigue strength, work hardening, stress anneal, heat treatment, hardening heat treatment Materials for construction of metallic prosthodontic appliances - gold alloys, chromium cobalt, swaged stainless steel, and many others and suitability of each material for the prosthodontic appliance. and many others. Types of casting machines, Principles of fabrication, introductory foundry technology, casting, moulding and



extrusion techniques, Densification and properties of compacts – bulk density, porosity and shrinkage, Thermal treatments, solidification, powder processing, hot isostatic pressures. Duplication of a model using refractory model materials, Casting failures, and how to avoid them.

DNT 306: Fixed Prosthodontics and technique I

(2 Units C: LH 30)

Learning Outcomes

At the end of this course, students should be able to:

1. fabricate dies and casts independently;
2. demonstrate the ability to fabricate all fixed restorations;
3. appreciate the principles underlying ceramic-metal restorations;
4. explain and justify all the principles behind fixed prostheses;
5. apply the knowledge of physiology and anatomy of the oral environment in the choice of the materials for fixed restoration;
6. interpret occlusal patterns in the fabrication of fixed restorations;
7. demonstrate the knowledge and skill required in the fabrication of fixed restorations;
8. demonstrate the process of ceramo metal restorations; and
9. interpret the prescription from a dentist for the design of fixed appliances.

Course Contents

Anatomy, physiology, design as well as safety of fixed appliances. Introduction to types of crown designs and the materials used in the fabrication of the crowns such as acrylic jacket crown, porcelain jacket crown, and evolution of porcelain crown, the use of modern ceramics such as Zirconia crown. All-metal crown, three-quarter crowns, half-crown, and their different modes of facing. The study of metallurgy and its function in providing the foundation for crown construction.

DNT 307: Principles of Dental Aesthetics and Occlusion

(2 Units C: LH 30)

Learning Outcomes

At the end of this course, students should be able to:

1. identify and appreciate the types of facial appearance and the principles behind shade selection in partial and completely edentulous individuals;
2. demonstrate the skill in selecting and position of artificial teeth;
3. explain important factors influencing occlusion, the biomechanics of stomatognathic system;
4. demonstrate understanding of the anatomy, physiology and function of temporomandibular joint;
5. describe the methods of selecting artificial teeth in completely edentulous individual;
6. describe know the method of selecting artificial teeth in partially edentulous individual;
7. identify the types of occlusal morphology in artificial teeth;
8. apply the principles of aesthetics in the positioning of artificial teeth;
9. connect the principles of occlusion and articulation with production of dental restorations; and
10. apply the knowledge of anatomy, physiology of stomatognathic system to the selection and setting up of artificial teeth for functional and aesthetic.



Course Contents

Evolving knowledge of the principles of dental aesthetics and its relationship to successful dental appliances. The aim is for the student to develop an appreciation of the importance of facial appearance, tooth positioning, and shade. Critical analysis of appliance design to assess suitability concerning the improvement or change in the patient's facial appearance. Terminology and principles of dental occlusion, development stages of occlusion, and the management of factors affecting normal occlusal relationships.

DNT 308: Dental Technology Techniques for Fixed Prosthodontics (2 Units: C: PH 30)

Learning Outcomes

At the end of this course, students should be able to:

1. describe and evaluate work process and the quality of finished prostheses;
2. analyses and critic the fabricated prostheses;
3. describe the laboratory stages of fabricating fixed prostheses;
4. describe the materials and instruments needed for making fixed prostheses;
5. interpret prescription from the dentist for the fabrication of fixed prostheses; and
6. fabricate all fixed prostheses in the laboratory.

Course Contents

Principles of 'lost wax' process in metal casting, preparation for partial dentures – spring, investment, burn-out, casting, sandblasting, timing polishing and finishing concerning metal works. Principles of metal melting in Dental Technology practice. Welding and soldering techniques. Description of spot welding and soldering equipment and hand tools. Casting technology – direct and indirect methods of investment, preparation of master model, sprueing principles, investing, methods of melting metal, casting force, pickling, polishing and finishing. Defects in casting – oxidation, back pressure, sprue falling, incomplete casting, Porosity, surface pitting, cooling shrinkage, occluded gases and many others.

DNT 309: Ceramics in Dental Technology

(2 Units C: LH 30)

Learning Outcomes

At the end of this course, students should be able to:

1. describe the types, properties and fabrication techniques in ceramic dentistry;
2. identify and describe the types and properties of ceramics;
3. explain various methods of fabrication techniques; and
4. describe the types, properties and fabrication techniques in ceramic dentistry.

Course Contents

Introduction to types of dental ceramics and their applications in dentistry. Types and properties of dental ceramics, their advantages and disadvantages. Various fabrication techniques for various types of ceramics such as sintering, heat pressing, dry pressing and sintering, slip casting and glass infiltration, soft machining and glass infiltration, soft machining, and sintering. Soft machining, sintering and heat pressing, heat machining, heat machining, and heat treatment.



HST 403: Research Methodology

(3 Units C: LH 45)

Learning Outcomes

At the end of the course, students should be able to:

1. identify research problems;
2. describe what literature search and review entail;
3. describe different research designs and sampling methods; and
4. describe the process of investigating a research problem.

Course Contents

Rudiments of research methodology and its application to the public health field. Basic learning of research problem definition, research questions, research and null hypothesis theoretical-conceptual formulation of research problems. Review of related literature, basic research designs. Methods of research observations, measurement of variables, data analytic techniques, interpretation of research findings. Randomisation techniques, epidemiologic research designs and controlled clinical trials.

DNT 401: Fixed Prosthodontics and Technique II

(2 Units C: LH 30)

Learning Outcomes

At the end of the course, students should be able to:

1. demonstrate the ability to fabricate all types of bridges;
2. list the principles underlying ceramo-metal bridge;
3. apply the knowledge of physiology and anatomy of the oral environment in the choice of the materials for bridges;
4. interpret occlusal patterns in the fabrication of bridges;
5. demonstrate the knowledge and skill required in the fabrication of bridges;
6. demonstrate the process of ceramo metal restorations; and
7. interpret the prescription from a dentist for the design of bridges.

Course Contents

Introduction to different types of bridge designs. Classification of bridges, the various materials, and equipment used for the fabrication of bridges. Resin-bonded bridges, All ceramic bridges, all-ceramic bridges, ceramic metal bridges. Laboratory stages in the construction of bridges.

DNT 403: Introduction to Orthodontic Techniques

(2 Units C: LH 30)

Learning Outcomes

At the end of the course, students should be able to:

1. define and classify orthodontic appliances;
2. recognise the type of orthodontic appliances; and
3. apply the principles of classification to how to design the orthodontic appliances.



Course Contents

History and development of Orthodontics – define Orthodontics, orthodontic treatment in contemporary dental practice, goals of orthodontic treatment, terminology in orthodontics, classification of orthodontic cases viz class I, class II and class III. orthodontic model making and trimming. Muscles of mastication and expression (facial). Review of the safety and the science of dental procedures, while introducing the skills required for manipulating wires and acrylic to fabricate orthodontic appliances. The anatomical study tooth repositioning and the appliances associated with orthodontics.

DNT 405: Introduction to Maxillofacial Prosthodontics

(2 Units C: LH 30)

Learning Outcomes

At the end of the course, students should be able to:

1. identify the different types of maxillofacial prostheses;
2. list and explain the different types of maxillary obturator;
3. identify the materials needed for the fabrication of the maxillary obturator; and
4. interpret prescription from the dentists.

Course Contents

Definition of maxillo-facial prosthetics. Introductory treatment of fractures related to the maxillo-facial region, the importance of maxillo-facial prosthetics in contemporary dental practice, history of maxillofacial prosthetics. Description of the outlay of a typical maxillo-facial laboratory and its essential requirements in terms of tools and equipment. Design of maxillo-facial laboratory taking safety precautions into account. Identification of common fracture sites in the maxillo-facial region and common maxillo-facial appliance such as acrylic splints, eyelet wiring, and many others.

DNT 413: Biostatistics

(2 Units C: LH 30)

Learning Outcomes

At the end of the course, students should be able to:

1. discuss the importance of statistics to research;
2. describe scientific methods of collating and summarizing data; and
3. select and apply appropriate statistical tests for testing hypotheses.

Course Contents

Importance and the central role of statistics in research. Review – types of variables, scales of measurement, the concept of sampling, data collection. Reduction, summarization, and presentation of data. Probability. The Normal distribution. Sampling methods. Tests of hypothesis (significant difference, correlation, regression, and many others). Parametric and non-parametric tests. Factors for considerations in choosing a particular statistic such as Student-t-test. Mann-Whitney U, ANOVA, MANOVA, Regression Analysis



SIWES 400: SIWES: Industrial Training**(6 Units C: PH 270)****Learning Outcomes**

1. The period where students have hands-on experience in an accredited institution and at the end of the period the students should be able to fabricate all routine appliances such as dentures, bridges, and crowns.

DNT 502: Research Project**(4 Units C: PH 180)****Learning Outcomes**

At the end of the course, students should be able to:

1. explain laboratory procedures including safety precautions;
2. carry out independent researches that will lead to tangible outcomes; and
3. present outcome of their researches in seminars and conferences.

Course Contents

Guided individualised tutorials in research implementation or product design and development. Student works one-on-one with assigned supervisor to initiate and execute a research project on an approved topic in the area of dental technology or the design and development of prototype dental technology devices. Such a project must have the potentials to come up with findings (facts, procedures, and/or devices) that could mitigate a predefined problem.

DNT 503: Digital Prosthodontics**(2 Units C: LH 30)****Learning Outcomes**

At the end of this course, students should be able to:

1. identify CAD/CAM systems and justify their use in dental technology;
2. describe the materials used in CAD/CAM;
3. identify the other supporting equipment used in CAD/CAM; and
4. describe the principles underpinning the use of CAD-CAM ceramics.

Course Contents

Definition of terms. Types/ classification of digital prosthodontics. Materials and equipment in digital prosthodontics. Applications and indications for CAD-CAM. Prerequisites for dental CAD-CAM success. Restorative materials for dental CAD-CAM system. scanning devices. Computer-assisted designs and Computer-assisted manufacturing.

DNT 504: Professional Ethics and Jurisprudence**(2 Units C: LH 30)****Learning Outcomes**

At the end of the course, students should be able to:

1. describe the functions of DTRBN;
2. appreciate the limits of professional practice;
3. describe vicarious liabilities and ethics of the profession; and
4. appreciate the principle of confidentiality and patients right to treatment.



Course Contents

Role of Dental Technologists Registration Board of Nigeria (DTRBN) in the practice and training in Dental Technology Profession. DTRBN Decree 43 of 1987. Right of the Board in regulating professional qualification required before entering the practice, various committees of the Board and their functions, Activities of Association of Dental Technologists of Nigeria (ADTN). The difference between the Board and ADTN. Responsibilities of ADTN to members of the profession, responsibilities of members to ADTN. Relationship of Dental Technologist to the welfare of Patients, code of conduct for practitioners and consequences of contravening the code. Inter-professional and intra-professional relationship in dental health care delivery. Procedures for setting up general dental laboratory practice – what the law states about setting up a business venture, definition of skill, malpractice in the profession, business ethics and corruption in practice, infamous or disgraceful conduct in the dental technology practice. Various offenses of a Dental Technologist as relates to disgraceful conduct, the legal aspect of health care law as relates to pitfalls in the practice of Dental Technology.

DNT 505: Orthodontic Laboratory Technique II

(2 Units C: LH 30)

Learning Outcomes

At the end of the course, students should be able to:

1. apply the principles of function and occlusion in the fabrication of orthodontic appliances;
2. recognise a satisfactorily constructed orthodontic appliance;
3. list and describe the materials and equipment necessary for the construction of orthodontic appliances;
4. apply the principles of design of orthodontic appliances in the fabrication of the orthodontic appliance; and
5. construct all types of removable and functional orthodontic appliances.

Course Contents

Different types of wires and the dimensions of the wires. Introduction to all the orthodontic work instruments. Practical sessions on wire bending, fabrication of different anchorage devices. Demonstration of different types of screws. Manipulation of acrylic resins for different orthodontic devices. Demonstration and construction of appliances with such anchorages.

DNT 506: Orthodontic Technology II

(2 Units C: LH 30)

Learning Outcomes

At the end of the course, students should be able to:

1. identify different types of screws, appliances to prevent sleep disorder;
2. describe the principles behind the use of these appliances; and
3. justify the use of such appliances in patients with cleft palate.

Course Contents

Principles of screws expansion appliances, springs, oral screen, and myofunctional appliances and procedures for construction of same, nonalveolar moulding devices for cleft lip and palate. Advanced orthodontic appliances.



DNT 507: Orthodontic Technology I

(2 Units C: LH 30)

Learning Outcomes

At the end of the course, students should be able to:

1. fabricate removable orthodontic appliances and solder different wires;
2. interpret dentist's prescription for removable orthodontic appliance;
3. describe and evaluate construction process and finished removable appliances;
4. recognise the classification of occlusion and orthodontic appliances;
5. describe different stages of fabrication of functional orthodontic appliances; and
6. describe construction process and evaluate finished functional appliances.

Course Contents

Principles of design and fabrication of removable and functional orthodontic appliances. Classification and types of removable and functional appliances. The equipment and materials for the fabrication of functional appliances. The stages and process of fabrication of removable and functional appliances. Principles of selection of removable orthodontic appliances and types of anchorage used.

DNT 508: Maxillo-Facial Technology II

(2 Units C: LH 45)

Learning Outcomes

At the end of the course, students should be able to:

1. define classification of defects and its complexities;
2. identify the stages of fabrication of a maxillary obturator; and
3. demonstrate the skill in carrying out detailed procedure of fabricating maxillary obturators.

Course Contents

Fabrication of all types of maxillofacial prosthetic devices such as eye, nasal, ear, and facial prostheses. Choice of materials and the process of the fabrication of all types of maxillofacial prostheses.

DNT 509: Maxillo-Facial Technology I

(2 Units C: LH 30)

Learning Outcomes

At the end of the course, students should be able to:

1. identify the different types of maxillofacial prostheses;
2. describe the different materials for maxillofacial prostheses and justify the indication for their use;
3. apply the principles of the design and complexities of different maxillofacial defects in the choice of the materials to be used and the method of retention of a maxillofacial prosthesis; and
4. fabricate interim maxillary obturator.

Course Contents

Skull and larynx bones identification using cadaver. Flip charts, slides. identification and construction of maxillo-facial appliances for management of fractures such as Barrel Bandage skull plates, obturators, jaw exercisers, chin support, Acrylic splints and many others, list and identification of materials used in maxillo-facial technology such as Silicones, adhesives, ferrous



oxides, dyes and many others. Definition and explanation of the different types of obturators such as Surgical obturators, intermediate obturators, and definitive obturators. Classification of defects and their complexities. Various methods of achieving retention in a maxillofacial prosthesis. Introduction to other types of prostheses such as eye, ear, nasal, and lip prostheses. Description of the anatomy of the head, noting the influence of surrounding muscles bones, and many others on the construction of facial prostheses and construct some commonly used facial prostheses.

DNT 512: Implantology in Dental Technology

(2 Units C: LH 30)

Learning Outcomes

At the end of the course, students should be able to:

1. describe the components of a dental implant especially the restorative abutments and impression copings;
2. identify the equipment needed in the laboratory for the fabrication of implant prostheses; and
3. identify the equipment needed in the laboratory for the fabrication of implant prostheses.

Course Contents

Fundamental terminology in technical implants: Introduction to implant systems, biocompatibility and implant, Design and types, Anatomy of maxilla and mandible, Types of bone, Principles of occlusion, Articulation, occlusal information and transfer of recording, occlusion in implantology. Knowledge of implant surgery. Radiographic, placement hard and soft tissue stents. treatment options for single tooth implants. study cast and diagnostic planning, Screw retained and cement-retained restorations implant placing and spacing. Abutment selection. Aesthetic considerations. Impression options and guidance techniques. Custom-made impression trays materials selection for manufacturing of components, model systems, and technical considerations in manufacture.

Minimum Academic Standards

There are five subspecialties in Dental Technology

1. Removable prosthodontic technology
2. Fixed prosthodontic technology
3. Orthodontic technology
4. Maxillofacial prosthodontic technology
5. Implant and special appliances technology

Equipment

The following are laboratory equipment that will be required for training the students on the programme.

Items

1. Casting Matching –Kerr
2. Compressor- Silent Oil Lubricated Type
3. Vibrators (Henry Shein)
4. Porcelain Furnace Multi Mat C
5. Vacuum Pumps
6. Lathe Polishing Machine (Henry Shein)
7. Lathe Trough for Polishing Machine
8. Model Trimmers (Henry Shein)
9. Boil Out Machine (Henry Shein)
10. Vacuum Forming Machine



11. Paco Multicure Curing Tank
12. Burnout Furnace 220v
13. Tabletop Trimming Machines Faro
14. Soldering Machines.
15. Fret Saw
16. Face Bow (Whip Mix).
17. Semi Adjustable Articulators (Whip Mix)
18. Dental Surveyors (Henry Shein)
19. Rubber Mould for Duplicating Edentulous Jaws
20. Clamps (Flask Press)
21. Sprue Former 1 And 6
22. Casting Ring S/S 3 And 6 (Dentarium)
23. Separating Disc
24. Articulators (A7plus Bio-Art)
25. Perfect Flexi Injection Unit (Pneumatic)
26. Perfect Flexi Cartridge Furnace
27. Flasks & Components Kit
28. Total 4 Metal Flasks (3 For Flexi & Acrylic Dentures)
29. 1 Flask for Crown & Bridge
30. Injection Sockets
31. L Key
32. Cartridge Sleeves
33. Metal Washers
34. 25 Empty Cartridges (For Acrylic Pressable Dentures)
35. 3 Cartridge Plugs
36. 3 Piston Head
37. Wooden Hammer
38. 1 Silicon Spray
39. 1 Cartridge Extraction. Rod And Base
41. 1 Empty Cartridge Sleeve. Lubricate Oil, Brush, Polishing Kit
42. Hot Welder Gun (With 2 Sticks of Welding Resin for Repair)
- 43/. Polishing Buff, Knife with Handle, Screwdriver, Adhesive
44. 3 Boxes (36) Cartridges large size (Flexi Resin) of Macrodent

Staffing

Staff for the programme can be categorised into two. academic and non-teaching staff. The non-teaching staff can be further categorized into four: Senior Technical, Senior Administrative, Technical, and Non-technical Junior Staff.

Academic Staff

Academic staff requirements are in terms of three criteria: number, structure, and qualifications (appointments and promotions).



Staff-Student Ratio

Determination of the number of academic staff required for an academic programme is contingent on the approved staff-student ratio for each discipline. The approved Staff-Student ratio for Allied Health Sciences Discipline is 1:15.

Staff – Mix by Rank

Academic staff in the Universities are broadly classified into three categories. Professorial (Professor/Reader) Senior lectureship and Lecturers Grade I and below. The Professorial cadre should constitute a maximum of 20 percent of the staff strength while the remaining two should constitute 35 and 45 percent respectively.

Not less than 70% of the Lecturers must have PhD **SPECIFICALLY** in one of the subspecialties of Dental Technology viz:

Removable prosthodontic Technology

Fixed Prosthodontic Technology

Orthodontic technology

Maxillofacial Prosthodontic Technology

Implant and Special Appliances Technology

Any Ph.D. holder from other disciplines without specific training in any of the above is not eligible to be recruited as academic staff.

Qualification for Appointment/Promotion of Academic Staff

The qualifications and other criteria necessary for an appointment and/ or promotion of academic staff at the various levels of the career structure are set out by the university senate.

Academic support personnel

Teaching Assistants/Demonstrators to help lecturers in the conduct of tutorials, practical and fieldwork.

Senior administrative staff

The programme shall have the following senior administrative staff who shall be responsible to the Dean:

Administrative Officer – not below Assistant Registrar

Two Executive Officers

A Secretary

The services of the administrative support staff are indispensable in the proper administration of Departments and Faculty offices. It is important to recruit very competent, computer literate senior staff. Each Department should have a Secretary to each Head of Department.

Technical support personnel

The services of technical support staff, which are indispensable in the proper running of laboratories and workshops, are required. It is important to recruit very competent senior technical staff to maintain teaching and research equipment. They are also to undergo regular training to keep them abreast of developments in equipment operation and maintenance.

Junior staff

There shall be non-teaching support staff who shall be responsible to the head of the programme such as Secretary, Clerical Officer, Driver and many others.



Library Resources

There shall be a departmental library with modern information communication technology facilities for electronic access and retrieval of information. The library must consist of books and periodic journals in the discipline of Dental technology. The Books must cover areas such as Removable Prosthodontic Technology, Fixed Prosthodontic Technology, Orthodontic Technology, Maxillofacial Technology, and Implant Technology. The periodic journals must cover the same subject discipline. Additionally, the University Library shall have a dedicated section or floor with adequate provision of current books and journals, periodicals.

Classrooms, Laboratories and Office Spaces

Classroom

The standard requirement of 0.65m² per full-time student should be maintained. Thus the minimum total space requirement for a faculty or department shall be the product of its total full time equivalent student enrolment (FTE) and the minimum space requirement per full-time equivalent i.e. (FTE) 0.65m².

Office

In this respect, each academic staff should have an office space of at least 25 square metres taking into cognisance the status/cadre of the staff

In addition, there should be for the Faculty, a Dean's office and for each Department a Head of Department's office with attached offices for their supporting staff as specified below in m²:

| | | |
|----------------------------------|---|-------|
| Professor's office | - | 18.50 |
| Head of Department's office | - | 18.50 |
| Tutorial teaching staff's office | - | 13.50 |
| Other teaching staff space | - | 7.00 |
| Technical staff space | - | 7.00 |
| Secretarial space | - | 7.00 |
| Staff research laboratory | - | 16.50 |
| Seminar Space/per student | - | 1.85 |
| Laboratory space (per student) | - | 7.50 |

Laboratories

The following laboratory must be provided by the training institution

Prosthetic Laboratory

Conservative Laboratory

Orthodontic Laboratory

Maxillofacial laboratory

There should be a dedicated classroom for each arm of the programme starting from year 3. In essence, there should be 3 dedicated classrooms for teaching.



B. DT Dental Therapy

Overview

A 5-year University training programme in Dental Therapy leading to the award of Bachelor of Dental Therapy. The programme shall be domiciled in any of the respective University's Faculty of Allied Health sciences. Dental therapists are professionals who are trained primarily to perform basic dental preventive services within a variety of practice settings. They are specially trained to work with the dentist to give care to patients. B. Dental therapy is a new programme in Nigerian Universities as Dental therapy has hitherto been offered at the four-year HND degree level in four centres in Nigeria. The curriculum has 10 semesters with two semesters per level. The first year lays the scientific foundation for the senior years. Clinical practice starts with simulated learning of clinical procedures at 300 level and this is built upon with SIWES and dental clinical practice at 400 level.

Philosophy

The broad philosophy of training in Dental Therapy is to provide sound academic and professional background for the production of Dental therapy professionals who would be capable of working anywhere in Nigeria and the world. They will be trained Dental Therapy professionals who would meet global standards and who could undertake further training towards specialisation. They will be trained professionals with sufficient management ability to play leadership role in the health sector and sound entrepreneurship skills in establishing self, and employing others, in training and general practice of the profession as applicable within enabling laws.

Objectives

The objectives of the bachelor degree programme are to:

1. provide students with a broad and balanced foundation knowledge and practical skills to enable them perform effectively in clinical, preventive, public health, academics and quality assurance; and function in collaboration with other members of the health team in the care of individuals and groups at all levels of health care;
2. involve the students in an intellectually stimulating and satisfying experience of learning, studying, research, creativity and innovation;
3. inculcate in students a sense of enthusiasm for the programme; an appreciation of its application in different contexts;
4. develop in students, the ability to apply knowledge and skills from their training to the solution of theoretical and practical problems in the health sector;
5. provide students with a knowledge and skills base from which they can proceed to further studies in Dental Therapy; and
6. empower graduates of Dental therapy with skills that will enable them engage in entrepreneurship and income yielding ventures.

At the end of the programme, students should be able to complement the work of the dentist by doing the following:

1. carry out scaling and polishing /curettage;
2. carry out public enlightenment campaigns on dental care;
3. practice the principles and techniques of dental therapy;
4. planning and participation in community mobilisation;



5. planning, conduct and evaluation of home visit;
6. Plaque control and dietary counselling;
7. curettage, deep scaling of sub-gingival calculus deposits;
8. application of fluoride and fissure sealants;
9. take dental radiographs;
10. educate patients on brushing techniques; and
11. prophylactic treatment.

Unique Features of the Programme

This is a new 5-year course leading to B. Dental Therapy which is different from the current programmes being offered where institutions run 3/4year courses leading to HND. This curriculum has a dissertation included in it which other Dental therapy programmes do not have. The curriculum ensures that Dental Therapists are equipped with digital and financial literacy to enable them work in both private and public settings.

Clinical proficiency and concurrent clinical and didactic teaching to enable dental therapists make independent clinical decisions and treat dental therapy patients independently will be ensured with this new curriculum.

Employability Skills

The programme is geared towards empowering the graduates to be self-employed and be part of the oral health care team. The programme will equip Dental Therapists who will be able to work at the PHC level as well as secondary and tertiary levels. It also targets those who want to work in the private sector by equipping them with the managerial and business skills needed to succeed. The therapists can also work in rural areas where dentists are in short supply.

21st Century Skills

1. Collaboration and team work
2. Creativity and imagination
3. Critical thinking
4. Problem solving
5. Flexibility and adaptability
6. Information Literacy
7. Leadership
8. Civic literacy and citizenship
9. Social responsibility
10. Technology literacy
11. Initiative

Admission and Graduation Requirements

The admission requirements into the programme is as contained under general issues for the Allied Health Sciences disciplines.

There are two different pathways by which candidates can be admitted into the Dental Therapy programme: the Unified Tertiary Matriculation Examination (UTME) and Direct Entry. To be admitted into the Dental Therapy programme, the candidate must meet these entry requirements.

Five-Year Degree Programme



Minimum of five credit level passes including English Language, Mathematics, Biology, Physics and Chemistry at SSC in not more than two sittings and acceptable level of pass in the UTME conducted by the Joint Admission and Matriculation Board (JAMB).

Direct Entry

First degree in relevant discipline, A' level in relevant science subjects which must include Physics, Chemistry and Biology at not less than B grade. Institutions could introduce additional selection criteria into the admission process.

Graduation Requirements

To be eligible for the award of B. Dental therapy degree, a student must have passed all the prescribed courses and satisfied the professional conduct as required for registration with the Dental Therapists Board of Nigeria.

Global Course Structure

100 level

| Course Code | Course Title | Unit(s) | Status | LH | PH |
|--------------|--------------------------------|-----------|--------|----|----|
| GST 111 | Communication in English | 2 | C | 15 | 45 |
| GST 112 | Nigerian peoples and culture | 2 | C | 30 | - |
| BIO 101 | General Biology I | 2 | C | 30 | - |
| BIO 102 | General Biology II | 2 | C | 30 | - |
| BIO 107 | General Biology Practical I | 1 | C | - | 45 |
| BIO 108 | General Biology Practical II | 1 | C | - | 45 |
| CHM 101 | General Chemistry I | 2 | C | 30 | - |
| CHM 102 | General Chemistry II | 2 | C | 30 | - |
| CHM 107 | General Chemistry Practical I | 1 | C | - | 45 |
| CHM 108 | General Chemistry Practical II | 1 | C | - | 45 |
| MTH 101 | Elementary Mathematics I | 2 | C | 30 | - |
| PHY 101 | General Physics I | 2 | C | 30 | - |
| PHY 102 | General Physics II | 2 | C | 30 | - |
| PHY 107 | General Physics Practical I | 1 | C | - | 45 |
| PHY 108 | General Physics Practical II | 1 | C | - | 45 |
| Total | | 24 | | | |

200 Level

| Course Code | Course Title | Unit(s) | Status | LH | PH |
|-------------|---------------------------------------|---------|--------|----|----|
| GST 212 | Philosophy, Logic and Human Existence | 2 | C | 30 | - |
| ENT 211 | Entrepreneurship and Innovation | 2 | C | 30 | - |
| DTH 201 | Oral anatomy and physiology | 2 | C | 30 | - |
| BCH 201 | General Biochemistry | 2 | C | 30 | - |
| BCH 203 | General Biochemistry Practical | 1 | C | - | 45 |
| PIO 201 | Introductory Physiology and Blood | 2 | C | 30 | - |
| NSC 201 | Foundations of Nursing | 2 | C | 30 | - |
| ANA 201 | Anatomy of Upper and Lower Limb | 2 | C | 15 | 45 |



| | | | | | |
|---------|--------------------------------------|-----------|---|----|---|
| PIO 202 | Principles of Cell Physiology | 2 | C | 30 | - |
| MCB 201 | Introduction to General Microbiology | 2 | C | 30 | - |
| ANA 202 | Histology of Basic Tissues | 2 | C | 30 | - |
| | Total | 21 | | | |

300 Level

| Course Code | Course Title | Unit(s) | Status | LH | PH |
|-------------|--|-----------|--------|----|----|
| GST 312 | Peace and conflict Resolution | 2 | C | 30 | - |
| ENT 312 | Venture creation | 2 | C | 15 | 45 |
| PHA 301 | General Principles of Pharmacology | 2 | C | 30 | - |
| DTH 312 | Dental Instrumentation, Care and Maintenance I | 2 | C | 15 | 45 |
| DTH 313 | Phantom head practice I | 1 | C | - | 45 |
| DTH 321 | Medical Microbiology | 2 | C | 30 | - |
| DTH 323 | Research Methodology | 2 | C | 30 | - |
| DTH 324 | Dental instrumentation Care and maintenance | 2 | C | 30 | - |
| DTH 326 | Applied Biostatistics | 2 | C | 30 | - |
| | Total | 17 | | | |

400 Level

| Course Code | Course Title | Unit(s) | Status | LH | PH |
|-------------|--|-----------|--------|----|-----|
| DTH 412 | Preventive and Community Dentistry | 2 | C | 30 | - |
| DTH 413 | Management skills in Dental Practice | 2 | C | 30 | - |
| DTH 415 | Transmissible diseases in the dental setting and Infection Control | 2 | C | 30 | - |
| DTH 416 | Medical Emergency and First Aid | 2 | C | 30 | - |
| DTH 417 | Introduction to Dental Radiography | 2 | C | 30 | - |
| DTH 418 | Introduction to Primary Oral Health Care | 2 | C | 30 | - |
| DTH 421 | Oral health education methods | 2 | C | 30 | |
| DTH 427 | Introduction to Restorative Dentistry and Prosthodontics | 2 | C | 30 | - |
| DTH 499 | SIWES | 5 | C | - | 270 |
| | Total | 21 | | | |

500 Level

| Course Code | Course Title | Unit(s) | Status | LH | PH |
|-------------|---------------------------------------|---------|--------|----|----|
| DTH 511 | Introduction to Paedodontics | 2 | C | 30 | - |
| DTH 512 | Introduction to Orthodontics | 2 | C | 30 | - |
| DTH 515 | Health Law and Ethics | 2 | C | 30 | - |
| DTH 516 | Periodontics | 2 | C | 30 | - |
| DTH 519 | Proposal writing and Research methods | 2 | C | 30 | - |
| DTH 521 | Advanced Dental Therapy Practice | 2 | C | - | 90 |



| | | | | | |
|---------|--|-----------|---|----|-----|
| DTH 522 | Introduction to Oral and Maxillofacial Surgery | 2 | C | 30 | - |
| DTH 523 | Oral Pathology/Oral Medicine | 2 | C | 30 | - |
| DTH 527 | Project | 6 | C | - | 270 |
| | Total | 22 | | | |

Course Contents and Learning Outcomes

100 Level

GST 111: Communication in English

(2 Units C: LH 15; PH 45)

Learning Outcomes

At the end of this course, students should be able to:

1. identify possible sound patterns in english language;
2. list notable language skills;
3. classify word formation processes;
4. construct simple and fairly complex sentences in english;
5. apply logical and critical reasoning skills for meaningful presentations;
6. demonstrate an appreciable level of the art of public speaking and listening; and
7. write simple and technical reports.

Course Contents:

Sound patterns in English Language (vowels and consonants, phonetics and phonology). English word classes (lexical and grammatical words, definitions, forms, functions, usages, collocations). Sentence in English (types: structural and functional, simple and complex). Grammar and Usage (tense, mood, modality and concord, aspects of language use in everyday life). Logical and Critical Thinking and Reasoning Methods (Logic and Syllogism, Inductive and Deductive Argument and Reasoning Methods, Analogy, Generalisation and Explanations). Ethical considerations, Copyright Rules and Infringements. Writing Activities: (Pre-writing, Writing, Post writing, Editing and Proofreading; Brainstorming, outlining, Paragraphing, Types of writing, Summary, Essays, Letter, Curriculum Vitae, Report writing, Note making and many others. Mechanics of writing). Comprehension Strategies: (Reading and types of Reading, Comprehension Skills, 3RsQ). Information and Communication Technology in modern Language Learning. Language skills for effective communication. Major word formation processes. Writing and reading comprehension strategies. Logical and critical reasoning for meaningful presentations. Art of public speaking and listening.



GST 112: Nigerian Peoples and Culture

(2 Units C: LH 30)

Learning Outcomes

At the end of the course, students should be able to:

1. analyse the historical foundation of the Nigerian culture and arts in pre-colonial times;
2. list and identify the major linguistic groups in Nigeria;
3. explain the gradual evolution of Nigeria as a political unit;
4. analyse the concepts of Trade, Economic and Self-reliance status of the Nigerian peoples towards national development;
5. enumerate the challenges of the Nigerian State towards Nation building;
6. analyse the role of the Judiciary in upholding people's fundamental rights;
7. identify acceptable norms and values of the major ethnic groups in Nigeria; and
8. list and suggest possible solutions to identifiable Nigerian environmental, moral and value problems.

Course Contents

Nigerian history. culture and art up to 1800 (Yoruba. Hausa and Igbo peoples and culture; peoples and culture of the ethnic minority groups). Nigeria under colonial rule (advent of colonial rule in Nigeria; Colonial administration of Nigeria). Evolution of Nigeria as a political unit (amalgamation of Nigeria in 1914; formation of political parties in Nigeria; Nationalist movement and struggle for independence). Nigeria and challenges of nation building (military intervention in Nigerian politics; Nigerian Civil War). Concept of trade and economics of self-reliance (indigenous trade and market system; indigenous apprenticeship system among Nigeria people; trade. skill acquisition and self-reliance). Social justices and national development (law definition and classification. Judiciary and fundamental rights. Individual. norms and values (basic Nigeria norms and values. patterns of citizenship acquisition; citizenship and civic responsibilities; indigenous languages. usage and development; negative attitudes and conducts. Cultism. kidnapping and other related social vices). Re-orientation. moral and national values (The 3R's – Reconstruction. Rehabilitation and Re-orientation; Re-orientation Strategies: Operation Feed the Nation (OFN). Green Revolution. Austerity Measures. War Against Indiscipline (WAI). War Against Indiscipline and Corruption (WAIC). Mass Mobilisation for Self-Reliance. Social Justice and Economic Recovery (MAMSER). National Orientation Agency (NOA). Current socio-political and cultural developments in Nigeria.

BIO 101: General Biology I

(2 Units C: LH 30)

Learning Outcomes

At the end of lectures, students should be able to:

1. explain cell's structure and organisations;
2. summarise functions of cellular organelle;
3. characterise living organisms and state their general reproduction;
4. describe the interrelationship that exists between organisms;
5. discuss the concept of heredity and evolution; and
6. enumerate habitat types and their characteristics.



Course Contents

Cell structure and organisation. functions of cellular organelles. characteristics and classification of living things. chromosomes, genes their relationships and importance. General reproduction. Interrelationships of organisms (competitions, parasitism, predation, symbiosis, commensalisms, mutualism, saprophytism). Heredity and evolution (introduction to Darwinism and Lamarckism, Mendelian laws, explanation of key genetic terms). Elements of ecology and types of habitat.

BIO 102: General Biology II

(2 Units C: LH 30)

Learning Outcomes

At the end of the lectures, students should be able to:

1. List the characteristics, methods of identification and classification of Viruses, bacteria and fungi;
2. state the unique characteristics of plant and animal kingdoms;
3. describe ecological adaptations in the plant and animal kingdoms;
4. explain nutrition, respiration, excretion and reproduction in plants and animals; and
5. describe growth and development in plants and animals.

Course Contents

Basic characteristics, identification and classification of viruses, bacteria and fungi. A generalised survey of the plant and animal kingdoms based mainly on the study of similarities and differences in the external features. Ecological adaptations. Briefs on physiology to include nutrition, respiration, circulatory systems, excretion, reproduction, growth and development.

BIO 107: General Biology Practical I

(1 Unit C: PH 45)

Learning Outcomes

At the end of the course, students should be able to:

1. outline common laboratory hazards;
2. provide precautions on laboratory hazards;
3. state the functions of the different parts of microscope;
4. use the microscope and describe its maintenance;
5. draw biological diagrams and illustrations; and
6. apply scaling and proportion to biological diagrams.

Course Contents

Common laboratory hazards: prevention and first aid. Measurements in biology. Uses and care of microscope. Compound and dissecting microscope. Biological drawings and illustration, scaling, accuracy and proportion; use of common laboratory apparatus and laboratory experiments designed to illustrate the topics covered in BIO 101.

BIO 108: General Biology Practical II

(1 Unit C: PH 45)

Learning Outcomes

At the end of the course, students should be able to:

1. describe the anatomy of flowering plants;
2. differentiate types of fruit and seeds;
3. state ways of handling and caring for biological wares;



4. describe the basic histology of animal tissues; and
5. identify various groups in the animal kingdom.

Course Contents

Anatomy of flowering plants, primary vegetative body: stem, leaf and root to show the mature tissues namely parenchyma, collenchyma, sclerenchyma, xylem and phloem. Types of fruits and seeds. Care and use of dissecting kits and other biological wares. Dissection and general histology of animal tissues based on vertebrate forms. Morphology and functions of epithelial, muscular, nervous and connective tissues. Examination of various groups of lower invertebrates under microscopes, identification of various groups of organisms in Animal Kingdom. And any experiment designed to emphasize the practical aspects of topics in BIO 102.

CHM 101: General Chemistry I

(2 Units C: LH 30)

Learning Outcomes

At the end of this course, the students should be able to:

1. define atom, molecules and chemical reactions;
2. discuss the Modern electronic theory of atoms;
3. write electronic configurations of elements on the periodic table;
4. rationalise the trends of atomic radii, ionization energies, electronegativity of the elements based on their position in the periodic table;
5. identify and balance oxidation – reduction equation and solve redox titration problems.
6. draw shapes of simple molecules and hybridized orbitals;
7. identify the characteristics of acids, bases and salts, and solve problems based on their quantitative relationship;
8. apply the principles of equilibrium to aqueous systems using Le Chatelier's principle to predict the effect of concentration, pressure and temperature changes on equilibrium mixtures;
9. analyse and perform calculations with the thermodynamic functions, enthalpy, entropy and free energy; and
10. determine rates of reactions and its dependence on concentration, time and temperature.

Course Contents

Atoms, molecules and chemical reactions. Modern electronic theory of atoms. Electronic configuration, periodicity and building up of the periodic table. Hybridization and shapes of simple molecules. Valence Forces. Structure of solids. Chemical equations and stoichiometry. Chemical bonding and intermolecular forces. Kinetic theory of matter. Elementary thermochemistry. Rates of reaction. Equilibrium and thermodynamics. Acids, bases and salts. Properties of gases. Redox reactions and introduction to electrochemistry. Radioactivity.

CHM 102: General Chemistry II

(2 Units C: LH 30)

Learning Outcomes

At the end of this course, the students should be able to:

1. state the importance and development of organic chemistry;
2. define fullerenes and its applications;
3. discuss electronic theory;
4. determine the qualitative and quantitative of structures in organic chemistry;
5. describe rules guiding nomenclature and functional group classes of organic chemistry;



6. determine rate of reaction to predict mechanisms of reactions;
7. identify classes of organic functional group with brief description of their chemistry;
8. discuss comparative chemistry of group 1A, IIA and IVA elements; and
9. describe basic properties of Transition metals.

Course Contents

Historical survey of the development and importance of Organic Chemistry. Fullerenes as fourth allotrope of carbon, uses as nanotubes, nanostructures, nanochemistry. Electronic theory in organic chemistry. Isolation and purification of organic compounds. Determination of structures of organic compounds including qualitative and quantitative analysis in organic chemistry. Nomenclature and functional group classes of organic compounds. Introductory reaction mechanism and kinetics. Stereochemistry. The chemistry of alkanes, alkenes, alkynes, alcohols, ethers, amines, alkyl halides, nitriles, aldehydes, ketones, carboxylic acids and derivatives. The Chemistry of selected metals and non-metals. Comparative chemistry of group IA, IIA and IVA elements. Introduction to transition metal chemistry.

CHM 107: General Chemistry Practical I

(1 Unit C: PH 45)

Learning Outcomes

At the end of the course the students should be able to:

1. state the general laboratory rules and safety procedures;
2. collect scientific data and correctly carrying out Chemical experiments;
3. identify the basic glassware and equipment in the laboratory;
4. state the differences between primary and secondary standards;
5. perform redox titration;
6. recording observations and measurements in the laboratory notebooks; and
7. analyse the data to arrive at scientific conclusions.

Course Contents

Laboratory experiments designed to reflect topics presented in courses CHM 101 and CHM 102. These include acid-base titrations, qualitative analysis, redox reactions, gravimetric analysis, data analysis and presentation.

CHM 108: General Chemistry Practical II

(1 Unit C: PH 45)

Learning Outcomes

At the end of this course, the students should be able to:

1. identify the general laboratory rules and safety procedures;
2. collect scientific data and correctly carrying out Chemical experiments;
3. identify the basic glassware and equipment in the laboratory;
4. identify and carry out preliminary tests which includes ignition, boiling point, melting point, test on known and unknown organic compounds;
5. perform solubility tests on known and unknown organic compounds;
6. conduct elemental tests on known and unknown compounds; and
7. conduct functional group/confirmatory test on known and unknown compounds which could be acidic / basic / neutral organic compounds.

Course Contents



Continuation of CHM 107. Additional laboratory experiments to include functional group analysis, quantitative analysis using volumetric methods.

PHY 101: General Physics I (Mechanics)

(2 Units C: LH 30)

Learning Outcomes

At the end of the course, student should be able to;

1. identify and deduce the physical quantities and their units;
2. differentiate between vectors and scalars;
3. describe and evaluate motion of systems on the basis of the fundamental laws of mechanics;
4. apply Newton's laws to describe and solve simple problems of motion;
5. evaluate work, energy, velocity, momentum, acceleration, and torque of moving or rotating objects;
6. explain and apply the principles of conservation of energy, linear and angular momentum;
7. describe the laws governing motion under gravity; and
8. explain motion under gravity and quantitatively determine behaviour of objects moving under gravity.

Course Contents

Space and time. Units and dimension, Vectors and Scalars. Differentiation of vectors: displacement, velocity and acceleration. Kinematics. Newton laws of motion (Inertial frames, Impulse, force and action at a distance, momentum conservation). Relative motion. Application of Newtonian mechanics. Equations of motion. Conservation principles in physics. Conservative forces. Conservation of linear momentum. Kinetic energy and work. Potential energy. System of particles. Centre of mass. Rotational motion: Torque, vector product, moment, rotation of coordinate axes and angular momentum. Polar coordinates. Conservation of angular momentum. Circular motion. Moments of inertia. gyroscopes and precession. Gravitation: Newton's Law of Gravitation. Kepler's Laws of Planetary Motion. Gravitational Potential Energy. Escape velocity. Satellites motion and orbits.

PHY 102: General Physics II (Electricity & Magnetism)

(2 Units C: LH 30)

Learning Outcomes

At the end of this course, the student should be able to:

1. describe the electric field and potential, and related concepts, for stationary charges;
2. calculate electrostatic properties of simple charge distributions using Coulomb's law, Gauss's law and electric potential;
3. describe and determine the magnetic field for steady and moving charges;
4. determine the magnetic properties of simple current distributions using Biot-Savart and Ampere's law;
5. describe electromagnetic induction and related concepts, and make calculations using Faraday and Lenz's laws;
6. explain the basic physical of Maxwell's equations in integral form;
7. evaluate DC circuits to determine the electrical parameters; and
8. determine the characteristics of ac voltages and currents in resistors, capacitors, and Inductors.

Course Contents



Forces in nature. Electrostatics; electric charge and its properties, methods of charging. Coulomb's law and superposition. electric field and potential. Gauss's law. Capacitance. Electric dipoles. Energy in electric fields. Conductors and insulators, current, voltage and resistance. Ohm's law and analysis of DC circuits. Magnetic fields. Lorentz force. Biot-Savart and Ampère's laws. magnetic dipoles. Dielectrics. Energy in magnetic fields. Electromotive force. Electromagnetic induction. Self and mutual inductances. Faraday and Lenz's laws. Step up and step-down transformers: Maxwell's equations. Electromagnetic oscillations and waves. AC voltages and currents applied to inductors, capacitors, resistance, and combinations.

PHY 107: General Practical Physics I

(1 Unit C: PH 45)

Learning Outcomes

At the end of the course, the student should be able to;

1. conduct measurements of some physical quantities;
2. make observations of events, collect and tabulate data;
3. identify and evaluate some common experimental errors;
4. plot and analyse graphs; and
5. draw conclusions from numerical and graphical analysis of data.

Course Contents

This introductory course emphasises quantitative measurements. The treatment of measurement errors, and graphical analysis. A variety of experimental techniques should be employed. The experiments include studies of meters, the oscilloscope, mechanical systems, electrical and mechanical resonant systems. Light. Heat. Viscosity and many others, covered in PHY 101 and PHY 102. However, emphasis should be placed on the basic physical techniques for observation, measurements, data collection, analysis and deduction.

PHY 108: General Practical Physics II

(1 Unit C: PH 45)

Learning Outcomes

At the end of this course, the student should be able to:

1. conduct measurements of some physical quantities;
2. make observations of events, collect and tabulate data;
3. identify and evaluate some common experimental errors;
4. plot and analyse graphs;
5. draw conclusions from numerical and graphical analysis of data; and
6. prepare and present practical reports.



Course Contents

This practical course is a continuation of PHY 107 and is intended to be taught during the second semester of the 100 level to cover the practical aspect of the theoretical courses that have been covered with emphasis on quantitative measurements. The treatment of measurement errors, and graphical analysis. However, emphasis should be placed on the basic physical techniques for observation, measurements, data collection, analysis and deduction.

MTH 101: Elementary Mathematics(Algebra and Trigonometry) (2 Units C: LH 30)

Learning Outcomes

At the end of the course students should be able to:

1. explain basic definition of Set, Subset, Union, Intersection, Complements and use of Venn diagrams;
2. solve quadratic equations;
3. solve trigonometric functions;
4. identify various types of numbers; and
5. solve some problems using Binomial theorem.

Course Contents

Elementary set theory. Subsets. Union. Intersection. Complements. Venn diagrams. Real numbers. Integers. Rational and irrational numbers. Mathematical induction. Real sequences and series. Theory of quadratic equations. Binomial theorem. Complex numbers. Algebra of complex numbers. The Argand diagram. De-Moiré's theorem. Nth roots of unity. Circular measure. Trigonometric functions of angles of any magnitude. Addition and factor formulae.

200 Level

GST 212: Philosophy, Logic and Human Existence

(2 Units C: LH 30)

Learning Outcomes

A student who has successfully gone through this course should be able to:

1. enumerate the basic features of philosophy as an academic discipline;
2. identify the main branches of philosophy & the centrality of logic in philosophical discourse;
3. describe the elementary rules of reasoning;
4. distinguish between valid and invalid arguments;
5. think critically and assess arguments in texts, conversations and day-to-day discussions;
6. critically assess the rationality or otherwise of human conduct under different existential conditions;
7. develop the capacity to extrapolate and deploy expertise in logic to other areas of knowledge; and
8. guide his or her actions, using the knowledge and expertise acquired in philosophy and logic.



Course Contents

Scope of philosophy; notions, meanings, branches and problems of philosophy. Logic as an indispensable tool of philosophy. Elements of syllogism, symbolic logic— the first nine rules of inference. Informal fallacies, laws of thought, nature of arguments. Valid and invalid arguments, logic of form and logic of content — deduction, induction and inferences. Creative and critical thinking. Impact of philosophy on human existence. Philosophy and politics, philosophy and human conduct, philosophy and religion, philosophy and human values, philosophy and character molding and many others.

ENT 211: Entrepreneurship and Innovation

(2 Units C: LH 30)

Learning Outcomes

At the end of this course, students should be able to:

1. explain the concepts and theories of entrepreneurship, intrapreneurship, opportunity seeking, new value creation, and risk taking;
2. state the characteristics of an entrepreneur;
3. analyse the importance of micro and small businesses in wealth creation, employment, and financial independence;
4. engage in entrepreneurial thinking;
5. identify key elements in innovation;
6. describe stages in enterprise formation, partnership and networking including business planning;
7. describe contemporary entrepreneurial issues in Nigeria, Africa and the rest of the world; and
8. state the basic principles of e-commerce.

Course Contents

Concept of Entrepreneurship (Entrepreneurship, Intrapreneurship/Corporate Entrepreneurship,). Theories, Rationale and relevance of Entrepreneurship (Schumpeterian and other perspectives. Risk-Taking. Necessity and opportunity-based entrepreneurship and Creative destruction). Characteristics of Entrepreneurs (Opportunity seeker, Risk taker, Natural and Nurtured, Problem solver and change agent, Innovator and creative thinker). Entrepreneurial thinking (Critical thinking. Reflective thinking and Creative thinking). Innovation (Concept of innovation. Dimensions of innovation. Change and innovation. Knowledge and innovation). Enterprise formation. Partnership and networking (Basics of Business Plan, Forms of business ownership, Business registration and Forming alliances and joint ventures). Contemporary Entrepreneurship Issues (Knowledge, Skills and Technology, Intellectual property, Virtual office, Networking). Entrepreneurship in Nigeria (Biography of inspirational Entrepreneurs, Youth and women entrepreneurship, Entrepreneurship support institutions, Youth enterprise networks and Environmental and cultural barriers to entrepreneurship). Basic principles of e-commerce.

DTH 201: Oral Anatomy and Physiology

(2 Units C: LH 30)

Learning Outcomes

At the end of the course, students should be able to:

1. describe tooth development;
2. describe anomalies of tooth formation;
3. state the functions of saliva;
4. describe the anatomy of oral structures; and



5. identify eruption times.

Course Contents

Embryological development of the oral cavity and its structures. The basal lamina. Mesodermal tissues of maxillary and mandibular process. Primary epithelial band. Vestibular band. Dental lamina. Dental papilla. Sheath of Hertwig. Period of formation of the various stages stated above. Dentinogenesis and its stages. Early dentine development. Later dentine development. Pulp tissue. Developmental stages of the teeth under the following. Dental follicles. Gum pads. Development of Dental tissues. Amelogenesis and its stages. Matrix formation. Calcification of matrix. Maturation. Anatomy of the oral cavity and associated structures. Oral Cavity: Tongue; Taste bud. Salivary glands: Major salivary glands and their locations: Parotid, Submandibular and Sublingual. Minor salivary glands - distributed all over the mouth, Palate, Tonsils and adenoids. Function of saliva in the maintenance of oral health. Saliva; Secretion. Quantity. Composition. Functions. Process of homeostasis. Morphology of the teeth. Definition of the following terms; Mesial - lingual; Distal - Buccal; Labial - palatal; Incisal - occlusal; Groove - Proximal; Triangular ridge; Oblique Ridge and many others. Structure of the teeth: Longitudinal section of both anterior and posterior part of the teeth. Mechanism of blood supply to the pulp tissue. Describe the Innervation of the teeth. Eruption of deciduous and permanent teeth: Tooth Eruption. Types of eruption. Active eruption. Passive eruption. Functional eruption. Incisor. Canine. 1st molar. 2nd molar. Period of 3rd molar formation and eruption of each set of teeth. Exfoliation of deciduous teeth.

BCH 201: General Biochemistry I

(2 Units C: LH 30)

Learning Outcomes

At the end of the course, students should be able to:

1. explain the structure of different macromolecules in biological system;
2. identify types of chemical reactions involving these macromolecules;
3. explain the various methods of isolation of these macromolecules;
4. estimate the effects of acids and alkalis on the macromolecules;
5. describe purification of macromolecules; and
6. discuss quantification of the various macromolecules.

Course Contents

Introductory chemistry of amino acids. Their properties, reactions and biological functions. Classification of amino acids: neutral, basic and acidic. Polar and non-polar. Essential and non-essential amino acids. Introductory chemistry of proteins. Methods of their isolation, purification and identification. Primary, secondary, tertiary and quaternary structures of proteins. Basic principles of tests for proteins and amino acids. Biological functions of proteins. Introductory chemistry of carbohydrates, lipids and nucleic acids. Nomenclature of nucleosides, and nucleotides. Effects of acid and alkali on hydrolysis of nucleic acids.



BCH 203: General Biochemistry Practical I

(1 Unit C: PH 45)

Learning Outcomes

At the end of the course, students should be able to describe the various laboratory procedures used in the study of various biochemical processes described in BCH 201 and 202.

Course Contents

Laboratory experiments designed to reflect the topics covered in BCH 201 and BCH 202. Introduction to laboratory methods and procedures employed in studying biochemical processes.

PIO 201: Introductory Physiology and Blood

(2 Units C: LH 30)

Learning Outcomes

At the end of the course, students should be able to:

1. describe the composition of a cell membrane;
2. explain how a potential difference across a membrane will influence the distribution of a cation and an anion;
3. describe how transport rates of certain molecules and ions are accelerated by specific membrane transport proteins;
4. distinguish between active (primary and secondary) transport, facilitated diffusion, and passive diffusion based on energy source and carrier protein involvement;
5. identify the mechanisms and role of selective transporters for amino acids, neurotransmitters, nutrients, etc.;
6. describe the general concepts of homeostasis and the principles of positive and negative feedback in physiological systems;
7. identify the site of erythropoietin production, the stimulus for its release, and the target tissue for erythropoietin action;
8. discuss the normal balance of red blood cell synthesis and destruction, including how imbalances in each lead to anemia or polycythemia;
9. list and differentiate the various types of leukocytes;
10. describe the role of thrombocytes in haemostasis; and
11. list clotting factors and the discuss the mechanism of anti-coagulants.

Course Contents

Introduction and history of physiology. Structure and functions of cell membranes. Transport process. Special transport mechanism in amphibian bladder, kidney, gall bladder, intestine, astrocytes and exocrine glands. Biophysical principles. Homeostasis and control systems including temperature regulation. Biological rhythms. Composition and functions of blood. Haemopoiesis. WBC and differential count. Plasma proteins Coagulation, fibrinolysis and platelet functions. Blood groups –ABO system – Rh system. Blood transfusion – indication for collection and storage of blood, hazards of blood transfusions. Reticulo- endothelial system. Immunity and immunodeficiency disease and HIV.



NSC 201: Foundations of Nursing

(2 Units C: LH 30)

Learning Outcomes

At the end of the course, students should be able to:

1. explain the nature of nursing and the trend towards the emergence of professional practice;
2. discuss the professional context of nursing practice with relevance to education, ethics and professional behaviours, and scientific basis of nursing practice;
3. discuss the concepts of health, healthcare delivery systems and contributions of government, non-governmental and international organisations to health care delivery;
4. discuss the components and use of nursing process and nursing care plan; and
5. demonstrate moderate competence in basic nursing skills covered as part of the core knowledge areas.

Course Contents

Introduction to the fundamentals of nursing as a profession, rudiments of health attainment and health care, giving extensive considerations to the roles of nurses within organisational and professional ethical prescriptions for the practice of nursing. Interpersonal communication and understanding of scientific basis of nursing care. Laboratory demonstration of basic nursing skills prior to exposure to clinical practice.

ANA 201: Anatomy Upper and Lower Limb

(2 Units C: LH 15; PH 45)

Learning Outcomes

At the end of the course, students should be able to:

1. define fundamental anatomical terminology and discuss the anatomical position;
2. describe the anatomy of the musculoskeletal system, including the axial skeleton; appendicular skeleton, appendicular and axial muscles, and arthrology;
3. describe the general features of the bones of the upper and lower limbs;
4. identify the major muscles of the upper and lower limbs;
5. explain the types and structure of the joints of the upper and lower limbs;
6. correlate between the attachment of the muscles and their functions on the different joints;
7. identify the major nerves of the upper and lower limbs;
8. describe the functional components of each of the major nerves and its distribution;
9. identify and describe the course of the major superficial veins of the upper and lower limbs; and
10. name the major arteries of the upper and lower limbs.

Course Contents

Descriptive terms, plans and terms of relationship of the human body, terms of comparison, attachment of muscles, types of muscles, movements of joints. Osteology, principles of kinesiology, general organisation of body system. Cutaneous innervation of the upper limb; pectoral region; breast; axilla; shoulder region; arm and cubital fossa; flexor compartment of forearm; extensor compartment of forearm; hand; venous and lymphatic drainage of the upper limb. Applied anatomy of nerves; blood supply of the upper limb. Cutaneous innervation of the lower limb; femoral triangle; adductor canal and medial side of the thigh; gluteal region; back of the thigh, popliteal fossa; extensor compartment of the leg and dorsum of the foot; peroneal and flexor compartment of the leg; sole of the foot, arches of the foot; mechanism of walking; venous



and lymphatic drainage of the lower limb; applied anatomy of the nerves and blood supply to the lower limb.

MCB 201: Introduction to General Microbiology

(2 Units C: LH 30)

Learning Outcomes

At the end of the course, students should be able to:

1. describe the scope of microbiology;
2. classify microorganisms;
3. describe the structure of microorganisms; and
4. describe bacterial infections.

Course Contents

Scope of microbiology, historical approach and many others Classification and nomenclature of microorganisms. The kingdom Protista. Organisational differences in eukaryotic cells. Bacterial cell form. Structure, nutrition, reproduction and metabolism. Bacterial genetics. A typical prokaryotic cell. Viruses. Eukaryotic microorganisms. Fungi. Microbial control. Microbes in foods, water and the environment. Bacterial infection and virulence. Introduction to pathogenic microbiology. Laboratory animals - types of breeding and uses.

ANA 202: Histology of Basic Tissues

(2 Units C: LH 30)

Learning Outcomes

At the end of the course, students should be able to:

1. name common current histological techniques;
2. enumerate the principles, techniques and functional applications of Histology;
3. define and explain the cell in relation to its environment, surface components and content;
4. appreciate the interrelationship and interdependency between cell structures and functions; and
5. identify the microscopic appearance of tissues such as muscle, cartilage, etc in relation to their staining.

Course Contents

Introduction to histology; Method of study in histology; Cell Membrane, Cellular organelles; Cell dynamics and cell cycle. Cytogenetics. Histochemistry and cytochemistry. Introduction to recombinant DNA; In situ hybridization histochemistry. Cell dynamics and cycle. Basic tissues of the body, the epithelial, connective tissues, muscle and nervous tissue. The microanatomy of the four basic tissues, namely: epithelial tissue, including glandular tissue, connective tissue, muscular tissue, and nervous tissue. Covering and Lining Epithelia. Glandular Epithelia. Connective tissue. Bone, Bone formation and Joints. Blood. Muscle. Nervous tissue (PNS). Nervous tissue (CNS). Cardiovascular system. Respiratory system. Integumentary system. Liver, Gallbladder and Pancreas. Gastro-intestinal system. Lymphatic tissue and the Immune system. Endocrine system. Urinary system. Female reproductive system. Male reproductive system. Eye.



300 Level

GST 312: Peace and Conflict Resolution

(2 Units C: LH 30)

Learning Outcomes

At the end of the course, students should be able to:

1. analyse the concepts of peace, conflict and security;
2. list major forms, types and root causes of conflict and violence;
3. differentiate between conflict and terrorism;
4. enumerate security and peace building strategies; and
5. describe roles of international organisations, media and traditional institutions in peace building.

Course Contents

Concepts of Peace. Conflict and Security in a multi-ethnic nation. Types and Theories of Conflicts: Ethnic. Religious. Economic. Geo-political Conflicts. Structural Conflict Theory. Realist Theory of Conflict. Frustration-Aggression Conflict Theory. Root causes of Conflict and Violence in Africa: Indigene and settlers Phenomenon. Boundaries/boarder disputes. Political disputes. Ethnic disputes and rivalries. Economic Inequalities. Social disputes. Nationalist Movements and Agitations. Selected Conflict Case Studies – Tiv-Junkun. Zango Kartaf. Chieftaincy and Land disputes and many others. Peace Building. Management of Conflicts and Security: Peace & Human Development. Approaches to Peace & Conflict Management --- (Religious. Government. Community Leaders and many others). Elements of Peace Studies and Conflict Resolution: Conflict dynamics assessment Scales: Constructive & Destructive. Justice and Legal framework: Concepts of Social Justice. The Nigeria Legal System. Insurgency and Terrorism. Peace Mediation and Peace Keeping. Peace & Security Council (International. National and Local levels) Agents of Conflict resolution – Conventions. Treaties Community Policing: Evolution and Imperatives. Alternative Dispute Resolution. ADR. Dialogue b). Arbitration. c). Negotiation d). Collaboration and many others. Roles of International Organisations in Conflict Resolution. (a). The United Nations. UN and its Conflict Resolution Organs. (b). The African Union & Peace Security Council (c). ECOWAS in Peace Keeping. Media and Traditional Institutions in Peace Building. Managing Post-Conflict Situations/Crisis: Refugees. Internally Displaced Persons. IDPs. The role of NGOs in Post-Conflict Situations/Crisis.

ENT 312: Venture Creation

(2 Units C: LH 15; PH 45)

Learning Outcomes

At the end of this course, students, through case study and practical approaches, should be able to:

1. describe the key steps in venture creation;
2. spot opportunities in problems and in high potential sectors regardless of geographical location;
3. state how original products, ideas, and concepts are developed;
4. develop business concept for further incubation or pitching for funding;
5. identify key sources of entrepreneurial finance;
6. implement the requirements for establishing and managing micro and small enterprises;
7. conduct entrepreneurial marketing and e-commerce;
8. apply a wide variety of emerging technological solutions to entrepreneurship; and
9. appreciate why ventures fail due to lack of planning and poor implementation.



Course Contents

Opportunity Identification (Sources of business opportunities in Nigeria. Environmental scanning. Demand and supply gap/unmet needs/market gaps/Market Research. Unutilised resources. Social and climate conditions and Technology adoption gap). New business development (business planning, market research). Entrepreneurial Finance (Venture capital, Equity finance. Micro finance. Personal savings. Small business investment organisations and Business plan competition). Entrepreneurial marketing and e-commerce (Principles of marketing, Customer Acquisition & Retention, B2B, C2C and B2C models of e-commerce, First Mover Advantage. E-commerce business models and Successful E-Commerce Companies,). Small Business Management/Family Business. Leadership & Management. Basic book keeping. Nature of family business and Family Business Growth Model. Negotiation and Business communication (Strategy and tactics of negotiation/bargaining. Traditional and modern business communication methods). Opportunity Discovery Demonstrations (Business idea generation presentations. Business idea Contest, Brainstorming sessions. Idea pitching). Technological Solutions (The Concept of Market/Customer Solution, Customer Solution and Emerging Technologies. Business Applications of New Technologies - Artificial Intelligence (AI), Virtual/Mixed Reality (VR), Internet of Things (IoTs), Blockchain, Cloud Computing, Renewable Energy and many others. Digital Business and E-Commerce Strategies).

PHA 301: General Principles of Pharmacology

(2 Units C: LH 30)

Learning Outcomes

At the end of the course, the students should be able to:

1. identify sources of drugs;
2. describe various routes of drug administration and how they influence onset of drug action;
3. identify the factors that affect drug absorption, distribution, metabolism and excretion;
4. state the role of receptors as targets for drug action;
5. explain the fundamental differences between agonists and antagonists; and
6. enumerate the common system parameters in pharmacokinetics and their measurements.

Course Contents

Introduction, History of Pharmacology and relationship of Pharmacology to other Pharmaceutical and clinical subjects. Definition and sources of Drugs. Routes of Drug Administration. Drug Absorption, Distribution, Elimination and factors affecting them. Enzyme induction and enzyme inhibition. Mechanisms of drug action – Receptor and non-receptor theory. Drug dosage and dose response curves. Measurement of some pharmacokinetic parameters.



DTH 312: Dental Instrumentation, Care and Maintenance (2 Units C: LH 15; PH 45)

Learning Outcomes

At the end of the course, the students should be able to:

1. identify instruments used in treat patients;
2. describe the uses of the instruments; and
3. demonstrate maintenance of the instruments.

Course Contents

Identification of the appropriate instruments for examination of the oral cavity such as dental (mouth) mirror, periodontal probe, other probes, tweezers. Set the instruments identified. Reflect, retract and protect parts of the mouth using dental mirror. Determine the depth of gum loss using the periodontal probe. Determine presence of tooth decay using other probes. Transfer materials to and from the oral cavity using tweezers. Identify the appropriate instruments for gross scaling such as jacquets 1,2 and 3, hoes, chisel, gross excavators and many others. Set the instruments identified ready for use. Apply the jacquets 1, 2, and 3 appropriately. Apply the hoes appropriately. Apply the chisels appropriately. Apply the gross excavators appropriately. Apply other instruments for gross scaling. Identify appropriate instruments for fine scaling such as drury scalars, fine excavators, chisel (fine), curettes, sickles and many others. Set the instruments identified ready for use. Apply the drury scalars appropriately. Apply the fine excavators appropriately. Apply the line chisels appropriately. Apply the curettes appropriately. Apply the sickles appropriately. Apply other instruments for fine scaling. Identify the appropriate equipment for tooth polishing such as dental units, dental chair, spot light. Identify the appropriate instruments for tooth polishing such as contra-angled arm piece, bristle brushes – wheel and cup types, rubber cups-small and large polisher, attach the instruments to the appropriate instrument. Polish tooth using the appropriate instrument.

DTH 313: Phantom Head Practice

(1 Unit C: PH 45)

Learning Outcomes

At the end of the course, the students should be able to:

1. identify the parts of a dental chair;
2. operate a dental chair;
3. maintain a dental chair in good condition; and
4. select appropriate patient chair positions for different procedures.

Course Contents

Use of simulation to learn patient management and clinical procedures. Dental chair parts and their uses. Operation of the dental chair and its maintenance. Chair positioning for each procedure.



DTH 321: Medical Microbiology

(2 Units C: LH 30)

Learning Outcomes

At the end of the course, students should be able to:

1. define microbial agents;
2. describe types of bacteria;
3. explain how the roles of saliva in oral health functions; and
4. describe transmission of infections.

Course Contents

History and scope of microbiology. The general characteristics of microorganisms. Prokaryotic and eukaryotic microorganisms. Bacterial morphology and cell structure. Growth and Reproduction of microorganisms. Microbial metabolism, antimicrobial agents. Systematic classification of bacteria, fungi, viruses, algae and protozoa; Microbial ecology. Microbial growth and identification. Prevention and Control of Microbial Diseases. Microbes in relation to environment agriculture and industries and many others. List and describe the different types of bacteria. Understand the fungi group of organisms. Explain viruses as micro-organisms. Know Algae and Rickettsia as disease causing organisms. Understand the spread of infection by Direct contact. Understand the spread of infection by Droplet. Explain transmission of infection by insects. Enumerate other method of spread of Infections. Understand how infections are resisted by skin secretion. Explain resistance of body against infection by Desquamation of skin epithelia] cells. Explain how saliva can help the body to resist infection. Understand how the body resists infection through cilia in the Respiratory tract. Explain the following: Immunity. Anaphylaxis. Allergy.

DTH 323: Research Methodology

(2 Units C: LH 30)

Learning Outcomes

At the end of the course, students should be able to:

1. define the terms used in health research;
2. describe the different types of research;
3. formulate hypothesis; and
4. select appropriate study designs to march objectives.

Course Contents

History of Health Research. Overview of Research Process/Evidence Based Practice. Definition, types and purpose. Significance of Research in health care settings. Research Process: Terms used in research. Steps in the research process; Literature review. Theoretical framework/Conceptual framework. Definition and determination of variables. Formulation of hypothesis. Research design. Population sample and sampling techniques. Methods of data collection. Data analysis and interpretation. Report of findings. Discussion of results. Recommendations. References and Bibliography.



DTH 324: Dental Instrumentation Care and Maintenance II**(2 Units C: LH 30)****Learning Outcomes**

At the end of this course, students should be able to:

1. carry out simple maintenance of the dental chair;
2. calibrate instruments and equipment; and
3. effectively clean hand instruments.

Course Contents

A continuation of DTH 312. Classify dental equipment and instruments into calibrated and non – calibrated one. Identify the units of calibration of dental surgery equipment and instruments. Adjust the calibration of dental surgery equipment and instrument where necessary. Maintenance of Hand Instrument - Identify the hand instruments used in the dental surgery such as scalars periodontal measures purses, Porte polisher and many others. Carry out simple maintenance of the hand tools identified above such as sharpening lubrication. Identify various items required for sharpening of hand instruments such as Arkansans stones, lubricating oil. Explain the various principles of sharpening hand instruments such as lubrication of the Arkansans stones, the firm grip of the Arkansans stones and many others. Sharpen various dental instruments. Clean and sterilize hand instruments; Preserve and store hand instruments: Identify the equipment needed in the dental surgery such as dental chair, dental unit, compressor, steriliser and many others. Carry out simple maintenance of the equipment above such as lubricating cleaning and many others.

DTH 326: Applied Biostatistics**(2 Units C: LH 30)****Learning Outcomes**

At the end of the course, students should be able to:

1. describe sources of data;
2. define types of variables;
3. describe different sampling methods; and
4. identify normal distribution.

Course Contents

Biostatistics. Sources and types of data. Population, and samples. Probability. distribution, normal, Poisson and Binomial distributions, mean. Standard error. Standard deviation. Skewness, Chi test, student tests. F- distribution. Regression. Correlation coefficient and analysis of variance (one way and two ways). It covers vital and health statistics.



400 Level

DTH 412: Preventive and Community Dentistry

(2 Units C: LH 30)

Learning Outcomes

At the end of this course, the students should be able to:

1. appreciate the concept of a community;
2. identify the characteristics of a community;
3. identify the components of primary oral health care; and
4. select appropriate oral health care delivery model for a community.

Course Contents

Introduction to oral health and community health. Concept oral health and community health. Principles of community dentistry and primary oral health. Relationship between oral health and community health. Models and strategies of promoting oral health care delivery in the community.

DTH 413: Management Skills in Dental practice

(2 Units C: LH 30)

Learning Outcomes

At the end of the course, students should be able to:

1. identify sources of capital;
2. explain types of ownership structures; and
3. carry out a feasibility study.

Course Contents

Concept of Entrepreneurship. Sources of capital in entrepreneurship. Entrepreneurship and private practice. Providers/Client relationship. Types of ownership. Sources of capital. Ethics, management of resources (equipment and materials), and resource levelling and crashing. Feasibility studies. Cost analysis and book keeping. Scheduling. Job loading and job sequencing. Service provision. Planning and control. Inspection and testing methods. Introduction to quality control. Best practices. Group/Individual implementation. Manufacturer and assembly of selected technological products in simulated production environments. Constructions of physical models of relevant concepts. Business management, stability, modelling and business challenges.

DTH 415: Transmissible Diseases/Infection Control

(2 Units C: LH 30)

Learning Outcomes

At the end of the course, students should be able to:

1. define, describe, apply, and differentiate between sterilisation and disinfection as best practices essential to maintaining a safe environment;
2. describe physical, chemical, and biological hazards in the dental clinic and understand ways to reduce them;
3. demonstrate proper hand hygiene techniques, appropriate use of infection control equipment, and use of personal protective equipment;
4. demonstrate placing and removing protective barriers;
5. demonstrate proper hand hygiene techniques;
6. demonstrate all infection control equipment use and maintenance and all stages of processing contaminated instruments; and



7. demonstrate use of personal protective equipment safely within a dental clinic and to prevent the spread of microbial diseases.

Course Contents

Chain of infection. Routes of transmission of infection in the dental clinic and know prevention of cross infections within the clinic. Sources of infection and occupational risk in dentistry. Transmissible infections in the dental setting. Concept of standard precaution. HIV and Dentistry. Infection control procedures and recommendations and Post exposure management.

DTH 416: Medical Emergency and First Aid

(2 Units C: LH 30)

Learning Outcomes

At the end of the course, students should be able to:

1. develop improved clinical reasoning skills;
2. appreciate the limits of dental therapy, consultation and referral processes;
3. evaluate and consult with supervising dentist for traumatic injuries;
4. perform cardiopulmonary resuscitation; and
5. describe the internal anatomy of permanent anterior teeth.

Course Contents

Basic skills for First Aid and safety measures for sudden illnesses and injuries in the home, playground, workplace and public places. Management of emergency conditions due to falls, cuts and abrasions, drowning, burns, electric shocks and many others. Skills in cardiopulmonary resuscitation. Mouth-to-mouth resuscitation. Definition of Accidents and Emergencies. Definition and principles of first aid. Current conditions of emergency, illness and injury. Signs and symptoms of surgical and medical emergencies and the reasons for referring them promptly. Types of specialists that emergencies are referred to. Accident prevention at home and in the community and many others. Emergencies, preparedness and Disaster management; Emergency Response. Planning, organisation and execution. Management of mass casualties, Pitfalls and barriers to disaster planning and response.

DTH 417: Introduction to Dental Radiography

(2 Units C: LH 30)

Learning Outcomes

At the end of the course, students should be able to:

1. competence at taking and processing the various film views used in general dental practice;
2. identify anatomical features and interpreting common pathology relative to oral radiology;
3. describe radiographic techniques to include hazards and regulation; and
4. assessment of image quality and use alternative imaging techniques.



Course Contents

Outline the history of radiography. Define the following terms: radiography, radiology, x-rays, radiation. List the types of radiation and their uses. Explain the concepts of matters, electricity. The x –ray tube. Basic x – ray absorption and scattered x – rays, identify x – ray films, intra – oral film, size and speed of extra oral film, film properties, explain the effects of radiation on living tissues. Describe the various protective measures against radiation hazards.

DTH 418: Introduction to Primary Oral Health Care

(2 Units C: LH 30)

Learning Outcomes

At the end of the course the students should be able to:

1. appreciate the concept of Primary oral health care;
2. describe the components of BPOC;
3. demonstrate the use of BPOC in the PHC system; and
4. design oral health education programmes for diverse populations.

Course Contents

Concept of Primary Oral Health Care. Oral health promotion. The integration of oral health care into the PHC. Importance of BPOC in PHC setting and group dynamics in Primary Oral Health Care. Roles of the dental therapist in the promotion of the primary health care setting. Referral of patients to the next management level for further management if necessary. Preventive and Control Measures: Know the general preventive and control measures of common dental diseases. Describe the various preventive and control measure of common dental diseases. Explain the preventive and control measures at the PHC level. Design an oral health education programme for the prevention and control of oral dental diseases in a community.

DTH 421: Oral Health Education Methods

(2 Units C: PH 30)

Learning Outcomes

At the end of the course, students should have:

1. provide oral health instruction and disease prevention instruction, including nutritional counselling and dietary analysis;
2. ability to demonstrate skills in the management and delivery of oral health education, and the development of oral health promotion programmes for a range of groups of people; and
3. ability to describe the requirements of an effective oral health educator.

Course Contents

Importance of good oral health. Define health. Explain dental health education. Explain the importance of good oral health. List the health risks associated with poor oral health. State the relationship between oral and general health. Describe the structures in the mouth that can aid maintenance of good oral health. Materials Required for Maintenance of Good Oral Health. Identify materials used for cleaning the mouths such as toothpaste, toothbrush, wood points, dental floss, chewing stick, oral rinses. Identify sources of the materials listed above. Describe the composition of a toothpaste. State the importance of fluoride in toothpaste. Describe a good toothbrush. Identify the various types of toothbrushes. Explain the differences observed in the various brushes mentioned above. Describe the various tooth brushing techniques. Explain the advantages and disadvantages of the techniques listed above. Demonstrate the acceptable tooth



brushing techniques. Identify the various types of chewing sticks. Explain advantages and disadvantages of the chewing sticks listed above on the teeth and the gingivae.

DTH 427: Introduction to Restorative Dentistry and Prosthodontics (2 Units C: LH 30)

Learning Outcomes

At the end of the course, the students should be able to:

1. demonstrate the appropriate selection of the dental biomaterials used in the basic restoration of primary and permanent teeth;
2. describe the limitations of restorative dental biomaterials; and
3. demonstrate the use of ART in caries management.

Course Contents

Introduction to restorative oral care and prosthodontics. Restorative oral care. Instruments used in restorative and prosthodontics. Dental materials and cements. Dental caries and its management, Aetiology, Classification, Management and Prevention. Use of Atraumatic Restorative Treatment (ART) in caries management. Tooth wear lesions: Causes, Risk factors and prevention. Types of prosthetic appliances and home care.

DTH 499: Students Industrial Work Experience Scheme (SIWES) (6 Units C: PH 270)

Learning Outcomes

At the end of the SIWES period students should be able to:

1. carry out clinical duties;
2. identify their roles in patient management;
3. organise the dental therapy clinics; and
4. carry out patient scheduling.

Course Contents

Students are attached to different dental hospitals and are expected to do routine clinical work such as patient management and primary oral health care services. An important aspect of the education and training of science students in the universities is organised exposure to some elements of industrial art. Students are expected to undertake this activity for 24 weeks (6 months) continuous which attracts 6 credit units earning upon successful completion. Industrial Training as a course involves the following:

1. Working successfully in the industry for the specified period.
2. Submitting of a Work Report to the Industrial Training Coordinating Centre at the end of the training period.
3. Presentation of seminar on the industrial training experience.



500 Level

DTH 511: Introduction to Paedodontics

(2 Units C: LH 30)

Learning Outcomes

At the end of the course student is required to be able to:

1. describe and identify the difference between deciduous and permanent teeth;
2. demonstrate child management techniques for examination and diagnosis;
3. demonstrate ability to identify and refer cases beyond the scope of dental therapy; and
4. perform oral health education for paediatric patients.

Course Contents

Compare the deciduous with the permanent dentition. Identify the types of teeth in the deciduous dentition. Classify teeth of the deciduous dentition. Describe the anatomy of each tooth in the deciduous dentition. Explain relationship of root formation to tooth eruption. Identify the eruption dates in the deciduous dentition. State the age when space for permanent teeth is well established. Identify conditions that lead to space loss in deciduous dentition. Explain need for tooth retention before exfoliation in children. Estimate the age of the child. Describe possible reactions of the child to the dental environment. Describe possible motivational actions above, and describe possible ways of sustaining the child's attention. Identify the child examination instruments. Examine the oral cavity (deciduous model) of the child using mouth mirror, examine the teeth (deciduous model) using the periodontal probes. Demonstrate the use of tweezer on the model. Identify possible oral presentation observable in the oral cavity. List possible diagnosis above such as carious lesions. Explain dental caries in children. Describe and apply dental caries control in children. Identify conditions other than caries that are common in children. Explain the mode of control of the conditions. Plan simple treatment and referral of cases such as Oral health education, scaling and polishing.

DTH 512 Introduction to Orthodontics

(2 Units C: LH 30)

Learning Outcomes

At the end of the course, students should be able to:

1. identify malocclusion;
2. describe malocclusion;
3. determine when referral is needed to the orthodontist; and
4. advise patients to seek orthodontic intervention.

Course Contents

Terminologies in Orthodontics. Define orthodontics. Define occlusion. Define normal occlusion. Define malocclusion. Define centric occlusion. Identify broadly when there is malocclusion. Identify orthodontic appliances. Advice and Care of orthodontic appliance.



DTH 515: Health Law/Ethics

(2 Units C: LH 30)

Learning Outcomes

At the end of the course the student is required to be able to:

1. define professionalism and ethics as they relate to the practice of the Dental Therapy;
2. identify and discuss the importance of professional, ethical behaviour;
3. explain why the application of professional behaviour is recommended and expected; and
4. demonstrate professional, ethical behaviour in patient and community interactions.

Course Contents

Review of Ethics of Dental and Standard of Practice. Dental Therapist Board of Nigeria Act. Ethical Code of Practice. Ethical Issues. Approaches to ethics. Ethical Theories. Domains of Medical Ethics. Preventive Ethics. Medico-Legal Aspects of Dental Therapy Practice. Policy of Dental profession and role of members. Definition of legal terms. Licensure. Legal responsibility. Liability. Contract. Plaintiff; Defendant. S Doctrine of Res Ipsa Loquitor; Negligence. The Patient Bill of Rights. Malpractice, Battery and Assault. Consent. Damages. National Health Act. The Dental Therapy and the Law. Legal Roles of the Therapist. Litigation and Dental Therapy Practice. Legal pitfalls in emergencies. Legal implications in the care of patients under special situations. Mentally disturbed patient. Alcohol and substance abuse patient. Attempted suicide patient. Telephone advice. Dispensing medication. Obtaining evidence by the police. Felony related cases. Handling evidence properly. Legal implications of responding to emergencies at scene of incident/accident. The emergency team. The good Samaritan laws. Responsibility to help and immunity from liability. Consent to treat, refusal of treatment/erring against medical advice. Types of notifiable/reportable cases in emergencies. Documentation. Incident Report. Report writing. Report giving. Taking and handing over of patients.

DTH 516: Periodontics

(2 Units C: LH 30)

Learning Outcomes

At the end of the course the students should be able to:

1. describe the aetiology of periodontal diseases;
2. explain the role of biofilm in periodontal disease;
3. explain the role of calculus in periodontal disease;
4. detect disease, supra and subgingival calculus; and
5. select appropriate instruments for treatment.

Course Contents

Tooth Deposits: Material Alba, Acquired Pellicle, Plaque and Calculus. Dental Stains (Extrinsic/Intrinsic). Aetiopathogenesis of Gingivitis. Aetiopathogenesis of Periodontitis. Clinical features of Gingivitis. Clinical features of Periodontitis. Epidemiology of Periodontal diseases. Periodontal Indices. Indications for Non-surgical periodontal Therapy. Simple non-surgical periodontal therapy. Basic principles guiding the use of surgical periodontal procedures in the management of periodontal disease. Periodontal Instrumentation I- Supragingival scalers, - Periodontal Instrumentation II- Subgingival scalers. Principles of treatment of a simple periodontal case.



DTH 519: Proposal writing and Research Methods**(2 Units C: LH 30)****Learning Outcomes**

At the end of the course students should be able to:

1. describe the components of a proposal;
2. identify a suitable methodology;
3. select appropriate data collection method; and
4. write a proposal for a study.

Course Contents

Writing a research proposal. Research Methodology. Qualitative and Quantitative data Samples and mixed methods and sampling methods. Types of data and sample size determination. Type and design of questionnaire. Focus Group Discussion. Key informant interviews. Environmental Sampling. Data collection methods. Data analysis including use of computer based analytical packages such as SPSS, EPI-INFO and many others. Proposal and report writing. Topic selection. Justification. Objectives. Literature search. Methodology, results and discussion. Referencing. Research Communication: Ethical Issues. Critique of Research Report. Application of research process in clinical practice. Acknowledgement of contributors and references. Communicating research findings. Utilisation of research findings.

DTH 521: Advanced Dental Therapy Practice**(2 Units C: PH 90)****Learning Outcomes**

At the end of the course, students should be able to:

1. develop improved clinical skills in patient management;
2. develop improved clinical skills in patient management;
3. identify and operate the ultrasonic scaling machines;
4. carry out simple maintenance of the ultrasonic scaler;
5. list the advantages and disadvantages of an ultrasonic scaler; and
6. identify when referrals are needed for complex cases.

Course Contents

Application of dental therapy theory and principles through clinical scenarios. Development of improved clinical reasoning skills. Understanding of the limits of dental therapy consultations and referral processes. Evaluation and consultation with Supervising dentist. Know the use of ultrasonic scalers (cavitron). Define an ultrasonic scaler. Identify the accessories used with the ultrasonic scalers such as interchangeable tips. Operate the ultrasonic scaler and its accessories. Carry out simple maintenance on the ultrasonic scaler. List the advantages and disadvantages of an ultrasonic scaler.

DTH 522: Introduction to Oral and Maxillofacial surgery**(2 Units C: LH 30)****Learning Outcomes**

At the end of the course the student should be able to:

1. examine patients effectively;
2. diagnose simple periodontal problems;
3. describe the makeup of the dental health care team and workforce models;
4. carry out effective communication and teamwork strategies; and



5. recognise when consultation or referral is needed.

Course Contents

Examination of patient. Relevance of systemic disease. Diagnosis and treatment planning. Differential diagnosis of "toothache". This module provides students with continuing clinical experience treating patients with more complex needs.

DTH 523: Oral Pathology and Oral Medicine

(2 Units C: LH 30)

Learning Outcomes

At the end of the course, the student should be able to:

1. identify oral manifestations of systemic nutritional deficiencies;
2. describe manifestations of nutritional deficiencies;
3. describe process of disease formation; and
4. diagnose periodontal diseases.

Course Contents

Oral manifestations of hormonal disturbances such as diabetes mellitus. Hyper parathyroid disturbances of growth hormone and many others. Identify common oral manifestations of nutritional deficiencies such as Deficiencies of vitamin C, D group; iron deficiency and many others. Define periodontal disease. Enumerate causes of periodontal disease such as local and systemic factors. Identify local factors in aetiology of periodontal diseases such as poor nutrition, hormonal factors, reduced body immunity such as AIDS. Describe the process of development of periodontal diseases. Identify the clinical presentation of periodontal diseases. Classify periodontal diseases into gingivitis and periodontitis. State the relationship between gingivitis and periodontitis. Aetiology of dental caries. Aetiology of periodontal diseases. Analgesics; Antibiotics;

DTH 527: Project

(6 Units C: PH 270)

Learning Outcomes

At the end of the dissertation, the student should be able to:

1. write a proposal and carry out research on a chosen topic;
2. identify an acceptable data collection method for the community;
3. collect data on the field; and
4. defend the project.

Course contents

Students will carry out a research project under supervision. Write a proposal and seek ethical clearance. Select a topic of clinical relevance. Analysis of data and many others.



Minimum Academic Standards

Equipment

Dental Therapy equipment (with indicated minimum quantity)

| | |
|---------|--|
| 5 Units | Dental chairs |
| 1 Unit | Standard simulation lab with minimum of 25 phantom heads/simulators |
| 6 Units | Portable Ultrasonic scalers |
| 1 Unit | X ray room |
| 20sets | Hand Scaling instruments |
| 5 Units | Oral hygiene models |
| 5 Units | ART sets |
| 2 Unit | Autoclaves |
| | Consumables – Prophylactic pastes, desensitizing pastes, gauze, cotton wool, PPE, Mouth wash tablets, disclosing tablets |

Staffing

Personnel

Staff of the Faculty can be categorised into two; academic and non-teaching staff. The non-teaching staff can be further categorised into four: Senior Technical, Senior Administrative, Technical and Non-technical Junior Staff. The minimum required staff are 2 Professors, 2 Senior lecturers and 4 Lecturers grade 1.

Academic Staff

Academic staff requirements are in terms of three criteria: number, structure, and qualifications (appointments and promotions).

Staff-Student Ratio

Determination of the number of academic staff required for an academic programme is contingent on the approved staff-student ratio for each discipline. The approved Staff-Student ratio for Dental therapy is 1:15.

Staff – Mix by Rank

Academic staff in the Universities are broadly classified into three categories; Professorial (Professor/Reader) Senior lectureship and Lecturers Grade I and below. The Professorial cadre should constitute a maximum of 20 percent of the staff strength while the remaining two should constitute 35 and 45 percent respectively.

Qualification for appointment/promotion of academic staff

The qualifications and other criteria necessary for appointment and/ or promotion of academic staff at the various levels of the career structure are set out in the table below.

Academic Support Personnel

Teaching Assistants/Demonstrators to help lecturers in the conduct of tutorials, practical and field work.



Senior administrative staff

The Faculty shall have the following senior administrative staff who shall be responsible to the Dean:

Faculty Officer – not below Assistant Registrar

Two executive officers

A secretary

The services of the administrative support staff are indispensable in the proper administration of Departments and Faculty offices. It is important to recruit very competent, computer literate senior staff. Each Department should have a Secretary to each Head of Department.

Technical support personnel

The services of technical support staff, which are indispensable in the proper running of laboratories and workshops, are required. It is important to recruit very competent senior technical staff to maintain teaching and research equipment. They are also to undergo regular training to keep them abreast of developments in equipment operation and maintenance.

Junior staff

The Faculty shall have non-teaching support staff who shall be responsible to the Dean such Secretary, Clerical Officer, Driver and many others. Each Department shall have a Secretary, Clerical Officer and other support staff as may be required

Library Resources

There should be a well-equipped medical library, with sufficient reading space and adequate supply of up-to-date journals, periodicals and reference text-books in all fields of Dentistry. Audio-visual and e-learning facilities as resource for learning must also be provided. The library shall have modern information communication facilities for electronic access and retrieval of information. Inter library loan services should be encouraged. Extensive e-learning, library and other facilities which include videos, CDs, DVDs, books, publications, access to electronic journals and facilities for telematic conferencing are also needed.

Classrooms, Laboratories and Office Spaces

Classroom

The standard requirement of 0.65m² per full-time student should be maintained. Thus the minimum total space requirement for a faculty or department shall be the product of its total full time equivalent student enrolment (FTE) and the minimum space requirement per full-time equivalent i.e. (FTE) 0.65m².

Office

In this respect, each academic staff should have an office space of at least 25 square metres taking into cognisance the status/cadre of the staff

In addition, there should be for the Faculty, a Dean's office and for each Department a Head of Department's office with attached offices for their supporting staff as specified below in m²:

| | | |
|----------------------------------|---|-------|
| Professor's office | - | 18.50 |
| Head of Department's office | - | 18.50 |
| Tutorial teaching staff's office | - | 13.50 |
| Other teaching staff space | - | 7.00 |
| Technical staff space | - | 7.00 |
| Secretarial space | - | 7.00 |



| | | |
|--------------------------------|---|-------|
| Staff research laboratory | - | 16.50 |
| Seminar Space/per student | - | 1.85 |
| Laboratory space (per student) | - | 7.50 |



B. EHS Environmental Health Science

Overview

The Degree of Bachelor of Environmental Health Sciences (B.EHS) is a 5-year University training programme in Environmental Health Science leading to the award of degree of Environmental Health Sciences denoted by **B.EHS**. The Bachelor of Environmental Health Sciences programme (B.EHS) shall be domiciled in the Faculty of Public Health, Faculty of Environmental Health or Faculty of Health Sciences but where none exists the preferred location of domiciliation should be Faculty of Allied Health Sciences.

Faculty graduates shall be eligible for registration to practice Environmental Health profession in Nigeria and elsewhere by Environmental Health Officers Registration Council of Nigeria (EHORECON) and similar licensing authorities outside Nigeria. Graduates from this programme shall be awarded a classified degree

The focus of the programme is such that it gives credence to the present-day Nigerian reality where dependence on government for essential services is no longer tenable. Hence, the embellishment of aspects of private practice for the Environmental Health Professionals that will emerge from it. Again the international perspectives infused will also make the would-be professionals internationally competitive especially within the African region. That way the students get more committed to learning and acquiring skills constantly in order to excel. On the other hand, the internship is made to be robust and all-encompassing such that the graduates' competitiveness in the complex job market can be maximally achieved.

Philosophy

The philosophy of the programme is the training of personnel to the highest academic and professional standards in the identification, resolution and sustainable management of environmental health and safety issues. The programme will provide highly skilled manpower, trained specifically for promoting health and preventing illness through applying scientific skills to solving contemporary and emerging environmentally-induced health problems as well in the effective and efficient management of cross cutting environmental health hazards.

Objectives

The general objective of the B.EHS Programme is to train Environmental Health Professionals equipped with adequate theoretical and practical scientific knowledge, skills, ethics, sound character and devotion to environmental management and health care.

The specific objectives are to produce Environmental Health professionals that will possess the following:

1. relevant knowledge, professional skills and competencies needed for the promotion and safeguarding of Public Health;
2. relevant knowledge required for effective recognition and response to environmental health challenges;
3. knowledge of disease prevention and control;
4. relevant knowledge and skills used in identification, detection, diagnosis and management of environmental health hazards;



5. Equipped with the right attitude of team work, leadership and professional enquiry in relation to Environmental Health;
6. Equipped with skills to conduct health education and promotion activities/programmes in the community;
7. Ability to Design, implement and participate in preventive, promotive and rehabilitative health care service delivery programmes;
8. Equipped with professional skills to carry out community diagnosis, mobilization and Environmental Sanitation and Hygiene services and programmes;
9. Equipped with relevant knowledge and skills to pursue advanced academic training and research in environmental health;
10. Knowledge and skills to participate in Emergency Preparedness, Response and Management;
11. Equipped with skills and competencies in Global and International Health in reducing morbidity and mortality;
12. Equipped with skills for Sanitary inspection, risk assessment/audit;
13. Knowledge and skills to conduct environmental health impact assessment of projects, programmes and Policies;
14. Relevant skills for management and administration of environmental health services;
15. Equipped with the requisite skills to develop and participate in private environmental services and consultancy;
16. Ability to establish, organise and manage environmental and public health laboratory using environmental media -air, water, soil, food and many others; and
17. Ability to establish, organise and manage environmental health services delivery entities in medical/public health pest and vector control, waste management, air quality management/monitoring, cleaning services, environmental health/sanitary inspection, audit and many others.

Unique Features of the Programme

The unique features of the programme are following:

1. the name/ title of the programme i.e Bachelor of Environmental Health Sciences (B.EHS);
2. the curriculum covers the following 23 specialty areas: Environmental Sanitation; Waste management; Food hygiene and safety; Pest and Vector control; Housing sanitation and hygiene; Air quality monitoring; Occupational health and safety; Water Sanitation and Hygiene; Noise control; Radiation control and health; Port health services; Children and Environmental Health; Environmental Justices; Pollution control and abatement; Health promotion and education; Enforcement of environmental and Public Health laws, policies, regulations and standards; Environmental Health Impact Assessment (such as EHIA); Environmental Health Laboratory practice; specialty areas in Environmental Health Profession; Concurrency of classroom lectures and practical instructions/postings; The professional role of Environmental Health Science in management; and
3. the introduction of Parts I, II, III professional examinations at levels 3, 4 & 5 is to ensure that students become conscious of the opportune position environmental health occupies based on its core objective of preventing disease and ill health arising from the more demanding interaction between man and the environment.



Employability Skills

B.EHS graduates should be able to:

1. render qualitative and effective service in both public and private Environmental health practice areas;
2. conduct risk assessment in premises with a view to proffering mitigative and preventive measures;
3. use modern equipment and tools for the purposes of evidence-based practice;
4. organise, supervise and evaluate environmental Health programmes and activities;
5. mobilise and utilise resources for Environmental Health programming; and
6. prepare and present high quality technical reports.

21st Century Skills

1. Collaboration and team work
2. Creativity and imagination
3. Critical thinking
4. Problem solving
5. Flexibility and adaptability
6. Information Literacy
7. Leadership
8. Civic literacy and citizenship
9. Social responsibility
10. Technology literacy
11. Initiative

Admission and Graduation Requirements

Admission Requirements

Five-Year Degree Programme

Candidates may be considered for admission to 100 level B.EHS degree course after passing at the required level, the Unified Tertiary Matriculation Examination of the Joint Admission and Matriculation Board (JAMB), provided they obtain the Senior Secondary Certificate (SSC) (or equivalent) at a minimum of credit level in five subjects including English Language, Mathematics, Physics, Chemistry and Biology taken and passed at not more than two sittings.

Direct Entry

1. In addition to SSC requirements stipulated above, applicants should possess at least two A'Level papers in relevant subjects. 200 level;
2. ND in relevant discipline with at least upper credit grade in addition to the five credit passes as in (a) above. 200 level;
3. HND in relevant discipline with at least upper credit in addition to five credit passes as in (a) above may be admitted into 300 level; and
4. A candidate who fulfils normal O'Level admission requirements and in addition holds an ND or HND certificates for Environmental Health Technologists.

Graduation Requirements

Conditions for graduation as provided in the general section of the Discipline.

For a candidate to graduate, he or she must pass all the taught courses, participated in all field and laboratory practicums and satisfied all institutional requirements. Candidates must pass the Professional Certification examinations to be administered by the University Faculty/Department



in collaboration with the Environmental Health Officers Registration Council of Nigeria (EHORECON). A student is expected to have a minimum score of 50 percent in each of the Professional examinations, failure in any of the Professional examinations may warrant a re-sit of the examination. The professional examinations shall consist as follows:

1. Part I: First Professional Examination: Taken at the end of second semester of 300 level. The evaluation for this shall be based on the core professional courses taught at 200 and 300 levels;
2. Part II: Second Professional Examination: Taken at the end of second semester of 400 level. The evaluation for this shall be based on the core professional courses taught at 400 level at the end of the field practicum; and
3. Part III: Third Professional Examination: Taken at the end of second Semester of 500 level. The evaluation for this shall be based on the cumulative core professional courses taught at 200, 300, 400 & 500 levels.

No Student shall be eligible to take the Third Professional Examination until they pass the earlier parts. Passing the Third Professional Examination will enable the graduate to be inducted into and be temporarily licensed to practice the profession as an intern pending the completion of the one-year mandatory internship under strict supervision by an experienced Environmental Health consultant and specialist before the National Youth Service.

Expected duration of the programme

Five-Year Degree Programme

Five academic sessions or 10 semesters

Direct Entry

Four academic sessions or eight semesters for ND Certificate holders

Three academic sessions or six semesters for HND Certificate holders

In general, no student will be allowed to exceed an additional 50% of the normal duration of the programme.



Global Course Structure

For uniformity, courses are broadly classified into core environmental health courses and others. The core Environmental Health Courses must be offered as described by this minimum standard in the Department of Environmental Health, while the others may be offered in other Departments and Faculties where such or similar courses exist. The core environmental health courses must retain the EHS (Environmental Health Science) code, while the others may retain the relevant departmental course code or carry another code of a similar course offered in another department or faculty.

Courses distribution

100 Level

| Course Code | Course title | Unit (s) | Status | LH | PH |
|-------------|------------------------------------|-----------|--------|----|----|
| GST 111 | Communication in English | 2 | C | 15 | 45 |
| GST 112 | Nigerian Peoples and Culture | 2 | C | 30 | - |
| BIO 101 | General Biology I | 2 | C | 30 | - |
| BIO 102 | General Biology II | 2 | C | 30 | - |
| BIO 107 | General Biology Practical I | 1 | C | - | 45 |
| BIO 108 | General Biology Practical II | 1 | C | - | 45 |
| CHM 101 | General Chemistry I | 2 | C | 30 | - |
| CHM 102 | General Chemistry II | 2 | C | 30 | - |
| CHM 107 | General Chemistry Practical I | 1 | C | - | 45 |
| CHM 108 | General Chemistry Practical II | 1 | C | - | 45 |
| COS 101 | Introduction to Computing Sciences | 3 | C | 30 | 45 |
| MTH 101 | Elementary Mathematics I | 2 | C | 30 | - |
| PHY 101 | General Physics I | 2 | C | 30 | - |
| PHY 107 | General Physics Practical I | 1 | C | - | 45 |
| PHY 102 | General Physics II | 2 | C | 30 | - |
| PHY 108 | General Physics Practical II | 1 | C | - | 45 |
| | Total | 27 | | | |



200 Level

| Course code | Course title | Unit(s) | Status | LH | PH |
|-------------|--|-----------|--------|----|----|
| GST 212 | Philosophy, Logic and Human Existence | 2 | C | 30 | - |
| ENT 211 | Entrepreneurship and Innovation | 2 | C | 30 | - |
| COS 201 | Computer Applications | 3 | C | 15 | 45 |
| ANA 201 | Anatomy of Upper and Lower Limb | 2 | C | 15 | 45 |
| MCB 201 | General Microbiology | 2 | C | 30 | - |
| MCB 203 | Microbiology Practical | 1 | C | - | 45 |
| BCH 201 | General Biochemistry I | 2 | C | 30 | - |
| BCH 203 | General Biochemistry Practical | 1 | C | - | 45 |
| POI 201 | Introductory Physiology and Blood | 2 | C | 15 | 45 |
| EHS 201 | Introduction to Environmental Health | 2 | C | 30 | - |
| EHS 202 | Fundamentals of Epidemiology | 2 | C | 30 | - |
| EHS 204 | Ecology and Environmental Management | 1 | C | 15 | - |
| EHS 208 | Health Psychology and Sociology | 2 | C | 30 | - |
| EHS 212 | Biostatistics | 2 | C | 30 | - |
| ENG 218 | Introduction to Engineering Drawing & Design | 2 | C | 30 | |
| | Total | 27 | | | |



300 Level

| Course code | Course title | Unit(s) | Status | LH | PH |
|-------------|--|-----------|--------|----|----|
| GST 312 | Peace and Conflict Resolution | 2 | C | 30 | - |
| ENT 312 | Venture Creation | 2 | C | 15 | 45 |
| EHS 301 | Basic Instrumentation and Use | 2 | C | 15 | 45 |
| EHS 307 | Introduction to Primary Health Care | 2 | C | 15 | 45 |
| EHS 311 | Introduction to Environmental Management | 2 | C | 30 | - |
| EHS 315 | Health, Safety & Environment | 2 | C | 15 | 45 |
| EHS 304 | Food Hygiene and Safety | 2 | C | 15 | 45 |
| EHS 306 | Sanitary Inspection of Premises/Audit | 2 | C | 15 | 45 |
| EHS 312 | Housing and Health | 2 | C | 15 | 45 |
| EHS 318 | Environmental Sanitation & Hygiene | 2 | C | 15 | 45 |
| | Total | 20 | | | |

400 Level

| Course code | Course title | Unit (s) | Status | LH | PH |
|-------------|---|-----------|--------|----|-----|
| EHS 401 | Environmental Toxicology | 2 | C | 30 | - |
| EHS 403 | Environmental Health Laboratory Techniques | 2 | C | 15 | 45 |
| EHS 419 | Pest and Vector Management | 2 | C | 15 | 45 |
| EHS 402 | Industrial Attachment (SIWES)/Field Practicum | 6 | C | - | 270 |
| | Total | 12 | | | |

The Second Semester of the **4th Year** should be used for Industrial Attachment/Field Practicum in order to expose students to Environmental Health facilities/practice areas in **rural** and **urban settings**. They are required to visit Environmental Health firms, industries and laboratories to enable them acquire the skills in Environmental Health practice. Each student must keep and present two log books (1 for ITF & 1 for Professional) for assessment at the end of his/her industrial attachment/field practicum. Log book shall carry not less than 25% of overall industrial attachment/practicum score.

Detail of practice areas is attached as Annexure 7 – SIWES/Field Practicum.



500 Level

| Course Code | Course title | Unit (s) | Status | LH | PH |
|-------------|---|-----------|--------|----|-----|
| EHS 501 | Seminar | 1 | C | 15 | - |
| EHS 503 | Water Sanitation and Hygiene | 2 | C | 15 | 45 |
| EHS 505 | Environmental Epidemiology | 2 | C | 30 | - |
| EHS 517 | Air Quality Management | 2 | C | 30 | - |
| EHS 521 | Research Methodology & Proposal Writing | 2 | C | 30 | |
| EHS 502 | Research Project | 4 | C | - | 180 |
| EHS 506 | Solid Waste Management | 2 | C | 15 | 45 |
| EHS 514 | Sewage and Waste Water Management | 2 | C | 15 | 45 |
| | Total | 17 | | | |

Course Contents and Learning Outcomes

100 Level

GST 111: Communication in English I

(2 Units C: LH 15; PH 45)

Learning Outcomes

At the end of this course, students should be able to:

1. identify possible sound patterns in English Language;
2. list notable Language skills;
3. classify word formation processes;
4. construct simple and fairly complex sentences in English;
5. apply logical and critical reasoning skills for meaningful presentations;
6. demonstrate an appreciable level of the art of public speaking and listening; and
7. write simple and technical reports.

Course Contents

Sound patterns in English Language (vowels and consonants, phonetics and phonology). English word classes (lexical and grammatical words, definitions, forms, functions, usages, collocations). Sentence in English (types: structural and functional, simple and complex). Grammar and Usage (tense, mood, modality and concord, aspects of language use in everyday life). Logical and Critical Thinking and REASONING Methods (Logic and Syllogism, Inductive and Deductive Argument and Reasoning Methods, Analogy, Generalisation and Explanations). Ethical considerations, Copyright Rules and Infringements. Writing activities: (Pre-writing , Writing, Post writing, Editing and Proofreading; Brainstorming, outlining, Paragraphing, Types of writing, Summary, Essays, Letter, Curriculum Vitae, Report writing, Note making and many others. Mechanics of writing). Comprehension Strategies: (Reading and types of Reading, Comprehension Skills, 3RsQ). Information and Communication Technology in modern Language Learning. Language skills for effective communication. Major word formation processes. Writing and reading comprehension strategies. Logical and critical reasoning for meaningful presentations. Art of public speaking and listening.



GST 112: Nigerian Peoples and Culture

(2 Units C: LH 30)

Learning Outcomes

At the end of the course, students should be able to:

1. analyse the historical foundation of the Nigerian culture and arts in pre-colonial times;
2. list and identify the major linguistic groups in Nigeria;
3. explain the gradual evolution of Nigeria as a political unit;
4. analyse the concepts of Trade, Economic and Self-reliance status of the Nigerian peoples towards national development;
5. enumerate the challenges of the Nigerian State towards Nation building;
6. analyse the role of the Judiciary in upholding people's fundamental rights;
7. identify acceptable norms and values of the major ethnic groups in Nigeria; and
8. list and suggest possible solutions to identifiable Nigerian environmental, moral and value problems.

Course Contents

Nigerian history, culture and art up to 1800 (Yoruba, Hausa and Igbo peoples and culture; peoples and culture of the ethnic minority groups). Nigeria under colonial rule (advent of colonial rule in Nigeria; Colonial administration of Nigeria). Evolution of Nigeria as a political unit (amalgamation of Nigeria in 1914; formation of political parties in Nigeria; Nationalist movement and struggle for independence). Nigeria and challenges of nation building (military intervention in Nigerian politics; Nigerian Civil War). Concept of trade and economics of self-reliance (indigenous trade and market system; indigenous apprenticeship system among Nigeria people; trade, skill acquisition and self-reliance). Social justices and national development (law definition and classification. Judiciary and fundamental rights. Individual, norms and values (basic Nigeria norms and values, patterns of citizenship acquisition; citizenship and civic responsibilities; indigenous languages, usage and development; negative attitudes and conducts. Cultism, kidnapping and other related social vices). Re-orientation, moral and national values (The 3R's – Reconstruction, Rehabilitation and Re-orientation; Re-orientation Strategies: Operation Feed the Nation (OFN), Green Revolution, Austerity Measures, War Against Indiscipline (WAI), War Against Indiscipline and Corruption (WAIC), Mass Mobilisation for Self-Reliance, Social Justice and Economic Recovery (MAMSER), National Orientation Agency (NOA). Current socio-political and cultural developments in Nigeria.

BIO 101: General Biology I

(2 Units C: LH 30)

Learning Outcomes

At the end of lectures, students should be able to:

1. explain cell's structure and organisations;
2. summarise functions of cellular organelle;
3. characterise living organisms and state their general reproduction;
4. describe the interrelationship that exists between organisms;
5. discuss the concept of heredity and evolution; and
6. enumerate habitat types and their characteristics.



Course Contents

Cell structure and organisation. functions of cellular organelles. characteristics and classification of living things. chromosomes, genes their relationships and importance. General reproduction. Interrelationships of organisms (competitions, parasitism, predation, symbiosis, commensalisms, mutualism, saprophytism). Heredity and evolution (introduction to Darwinism and Lamarckism, Mendelian laws, explanation of key genetic terms). Elements of ecology and types of habitat.

BIO 102: General Biology II

(2 Units C: LH 30)

Learning Outcomes

At the end of the lectures, students should be able to:

1. List the characteristics, methods of identification and classification of Viruses, bacteria and fungi;
2. state the unique characteristics of plant and animal kingdoms;
3. describe ecological adaptations in the plant and animal kingdoms;
4. explain nutrition, respiration, excretion and reproduction in plants and animals; and
5. describe growth and development in plants and animals.

Course Contents

Basic characteristics, identification and classification of viruses, bacteria and fungi. A generalised survey of the plant and animal kingdoms based mainly on the study of similarities and differences in the external features. Ecological adaptations. Briefs on physiology to include nutrition, respiration, circulatory systems, excretion, reproduction, growth and development.

BIO 107: General Biology Practical I

(1 Unit C: PH 45)

Learning Outcomes

At the end of the course, students should be able to:

1. outline common laboratory hazards;
2. provide precautions on laboratory hazards;
3. state the functions of the different parts of microscope;
4. use the microscope and describe its maintenance;
5. draw biological diagrams and illustrations; and
6. apply scaling and proportion to biological diagrams.

Course Contents

Common laboratory hazards: prevention and first aid. Measurements in biology. Uses and care of microscope. Compound and dissecting microscope. Biological drawings and illustration, scaling, accuracy and proportion; use of common laboratory apparatus and laboratory experiments designed to illustrate the topics covered in BIO 101.



BIO 108: General Biology Practical II

(1 Unit C: PH 45)

Learning Outcomes

At the end of the course, students should be able to:

1. describe the anatomy of flowering plants;
2. differentiate types of fruit and seeds;
3. state ways of handling and caring for biological wares;
4. describe the basic histology of animal tissues; and
5. identify various groups in the animal kingdom.

Course Contents

Anatomy of flowering plants, primary vegetative body: stem, leaf and root to show the mature tissues namely parenchyma, collenchyma, sclerenchyma, xylem and phloem. Types of fruits and seeds. Care and use of dissecting kits and other biological wares. Dissection and general histology of animal tissues based on vertebrate forms. Morphology and functions of epithelial, muscular, nervous and connective tissues. Examination of various groups of lower invertebrates under microscopes, identification of various groups of organisms in Animal Kingdom. And any experiment designed to emphasize the practical aspects of topics in BIO 102.

CHM 101: General Chemistry I

(2 Units C: LH 30)

Learning Outcomes

At the end of this course, the students should be able to:

1. define atom, molecules and chemical reactions;
2. discuss the Modern electronic theory of atoms;
3. write electronic configurations of elements on the periodic table;
4. rationalise the trends of atomic radii, ionization energies, electronegativity of the elements based on their position in the periodic table;
5. identify and balance oxidation – reduction equation and solve redox titration problems.
6. draw shapes of simple molecules and hybridized orbitals;
7. identify the characteristics of acids, bases and salts, and solve problems based on their quantitative relationship;
8. apply the principles of equilibrium to aqueous systems using Le Chatelier's principle to predict the effect of concentration, pressure and temperature changes on equilibrium mixtures;
9. analyse and perform calculations with the thermodynamic functions, enthalpy, entropy and free energy; and
10. determine rates of reactions and its dependence on concentration, time and temperature.

Course Contents

Atoms, molecules and chemical reactions. Modern electronic theory of atoms. Electronic configuration, periodicity and building up of the periodic table. Hybridization and shapes of simple molecules. Valence Forces. Structure of solids. Chemical equations and stoichiometry. Chemical bonding and intermolecular forces. Kinetic theory of matter. Elementary thermochemistry. Rates of reaction. Equilibrium and thermodynamics. Acids, bases and salts. Properties of gases. Redox reactions and introduction to electrochemistry. Radioactivity.



CHM 102: General Chemistry II

(2 Units C: LH 30)

Learning Outcomes

At the end of this course, the students should be able to:

1. state the importance and development of organic chemistry;
2. define fullerenes and its applications;
3. discuss electronic theory;
4. determine the qualitative and quantitative of structures in organic chemistry;
5. describe rules guiding nomenclature and functional group classes of organic chemistry;
6. determine rate of reaction to predict mechanisms of reactions;
7. identify classes of organic functional group with brief description of their chemistry;
8. discuss comparative chemistry of group 1A, IIA and IVA elements; and
9. describe basic properties of Transition metals.

Course Contents

Historical survey of the development and importance of Organic Chemistry. Fullerenes as fourth allotrope of carbon, uses as nanotubes, nanostructures, nanochemistry. Electronic theory in organic chemistry. Isolation and purification of organic compounds. Determination of structures of organic compounds including qualitative and quantitative analysis in organic chemistry. Nomenclature and functional group classes of organic compounds. Introductory reaction mechanism and kinetics. Stereochemistry. The chemistry of alkanes, alkenes, alkynes, alcohols, ethers, amines, alkyl halides, nitriles, aldehydes, ketones, carboxylic acids and derivatives. The Chemistry of selected metals and non-metals. Comparative chemistry of group IA, IIA and IVA elements. Introduction to transition metal chemistry.

CHM 107: General Chemistry Practical I

(1 Unit C: PH 45)

Learning Outcomes

At the end of the course the students should be able to:

1. state the general laboratory rules and safety procedures;
2. collect scientific data and correctly carrying out Chemical experiments;
3. identify the basic glassware and equipment in the laboratory;
4. state the differences between primary and secondary standards;
5. perform redox titration;
6. recording observations and measurements in the laboratory notebooks; and
7. analyse the data to arrive at scientific conclusions.

Course Contents

Laboratory experiments designed to reflect topics presented in courses CHM 101 and CHM 102. These include acid-base titrations, qualitative analysis, redox reactions, gravimetric analysis, data analysis and presentation.



CHM 108: General Chemistry Practical II

(1 Unit C: PH 45)

Learning Outcomes

At the end of this course, the students should be able to:

1. identify the general laboratory rules and safety procedures;
2. collect scientific data and correctly carrying out Chemical experiments;
3. identify the basic glassware and equipment in the laboratory;
4. identify and carry out preliminary tests which includes ignition, boiling point, melting point, test on known and unknown organic compounds;
5. perform solubility tests on known and unknown organic compounds;
6. conduct elemental tests on known and unknown compounds; and
7. conduct functional group/confirmatory test on known and unknown compounds which could be acidic / basic / neutral organic compounds.

Course Contents

Continuation of CHM 107. Additional laboratory experiments to include functional group analysis, quantitative analysis using volumetric methods.

COS 101: Introduction to Computing Sciences

(3 Units C: LH 30: PH 45)

Learning Outcomes

At the end of the course, students should be able to:

1. explain basic components of computers and other computing devices;
2. describe the various applications of computers;
3. explain information processing and its roles in the society;
4. describe the Internet, its various applications and its impact;
5. explain the different areas of the computing discipline and its specialisations; and
6. demonstrate practical skills on using computers and the internet.

Course Contents

Brief history of computing. Description of the basic components of a computer/computing device. Input/Output devices and peripherals. Hardware, software and human ware. Diverse and growing computer/digital applications. Information processing and its roles in society. The Internet, its applications and its impact on the world today. The different areas/programs of the computing discipline. The job specialisations for computing professionals. The future of computing.

Lab Work: Practical demonstration of the basic parts of a computer. Illustration of different operating systems of different computing devices including desktops, laptops, tablets, smart boards and smart phones. Demonstration of commonly used applications such as word processors, spreadsheets, presentation software and graphics. Illustration of input and output devices including printers, scanners, projectors and smartboards. Practical demonstration of the Internet and its various applications. Illustration of browsers and search engines. How to access online resources.



PHY 101: General Physics I (Mechanics)

(2 Units C: LH 30)

Learning Outcomes

At the end of the course, student should be able to;

1. identify and deduce the physical quantities and their units;
2. differentiate between vectors and scalars;
3. describe and evaluate motion of systems on the basis of the fundamental laws of mechanics;
4. apply Newton's laws to describe and solve simple problems of motion;
5. evaluate work, energy, velocity, momentum, acceleration, and torque of moving or rotating objects;
6. explain and apply the principles of conservation of energy, linear and angular momentum;
7. describe the laws governing motion under gravity; and
8. explain motion under gravity and quantitatively determine behaviour of objects moving under gravity.

Course Contents

Space and time. Units and dimension, Vectors and Scalars. Differentiation of vectors: displacement, velocity and acceleration. Kinematics. Newton laws of motion (Inertial frames, Impulse, force and action at a distance, momentum conservation). Relative motion. Application of Newtonian mechanics. Equations of motion. Conservation principles in physics. Conservative forces. Conservation of linear momentum. Kinetic energy and work. Potential energy. System of particles. Centre of mass. Rotational motion: Torque, vector product, moment, rotation of coordinate axes and angular momentum. Polar coordinates. Conservation of angular momentum. Circular motion. Moments of inertia. gyroscopes and precession. Gravitation: Newton's Law of Gravitation. Kepler's Laws of Planetary Motion. Gravitational Potential Energy. Escape velocity. Satellites motion and orbits.

PHY 102: General Physics II (Electricity & Magnetism)

(2 Units C: LH 30)

Learning Outcomes

At the end of this course, the student should be able to:

1. describe the electric field and potential, and related concepts, for stationary charges;
2. calculate electrostatic properties of simple charge distributions using Coulomb's law, Gauss's law and electric potential;
3. describe and determine the magnetic field for steady and moving charges;
4. determine the magnetic properties of simple current distributions using Biot-Savart and Ampere's law;
5. describe electromagnetic induction and related concepts, and make calculations using Faraday and Lenz's laws;
6. explain the basic physical of Maxwell's equations in integral form;
7. evaluate DC circuits to determine the electrical parameters; and
8. determine the characteristics of ac voltages and currents in resistors, capacitors, and Inductors.



Course Contents

Forces in nature. Electrostatics; electric charge and its properties, methods of charging. Coulomb's law and superposition. electric field and potential. Gauss's law. Capacitance. Electric dipoles. Energy in electric fields. Conductors and insulators, current, voltage and resistance. Ohm's law and analysis of DC circuits. Magnetic fields. Lorentz force. Biot-Savart and Ampère's laws. magnetic dipoles. Dielectrics. Energy in magnetic fields. Electromotive force. Electromagnetic induction. Self and mutual inductances. Faraday and Lenz's laws. Step up and step-down transformers: Maxwell's equations. Electromagnetic oscillations and waves. AC voltages and currents applied to inductors, capacitors, resistance, and combinations.

PHY 107: General Practical Physics I

(1 Unit C: PH 45)

Learning Outcomes

At the end of the course, the student should be able to;

1. conduct measurements of some physical quantities;
2. make observations of events, collect and tabulate data;
3. identify and evaluate some common experimental errors;
4. plot and analyse graphs; and
5. draw conclusions from numerical and graphical analysis of data.

Course Contents

This introductory course emphasises quantitative measurements. The treatment of measurement errors, and graphical analysis. A variety of experimental techniques should be employed. The experiments include studies of meters, the oscilloscope, mechanical systems, electrical and mechanical resonant systems. Light. Heat. Viscosity and many others, covered in PHY 101 and PHY 102. However, emphasis should be placed on the basic physical techniques for observation, measurements, data collection, analysis and deduction.

PHY 108: General Practical Physics II

(1 Unit C: PH 45)

Learning Outcomes

At the end of this course, the student should be able to:

1. conduct measurements of some physical quantities;
2. make observations of events, collect and tabulate data;
3. identify and evaluate some common experimental errors;
4. plot and analyse graphs;
5. draw conclusions from numerical and graphical analysis of data; and
6. prepare and present practical reports.

Course Contents

This practical course is a continuation of PHY 107 and is intended to be taught during the second semester of the 100 level to cover the practical aspect of the theoretical courses that have been covered with emphasis on quantitative measurements. The treatment of measurement errors, and graphical analysis. However, emphasis should be placed on the basic physical techniques for observation, measurements, data collection, analysis and deduction.



MTH 101: Elementary Mathematics(Algebra and Trigonometry) (2 Units C: LH 30)

Learning Outcomes

At the end of the course students should be able to:

1. explain basic definition of Set, Subset, Union, Intersection, Complements and use of Venn diagrams;
2. solve quadratic equations;
3. solve trigonometric functions;
4. identify various types of numbers; and
5. solve some problems using Binomial theorem.

Course Contents

Elementary set theory. Subsets. Union. Intersection. Complements. Venn diagrams. Real numbers. Integers. Rational and irrational numbers. Mathematical induction. Real sequences and series. Theory of quadratic equations. Binomial theorem. Complex numbers. Algebra of complex numbers. The Argand diagram. De-Moiré's theorem. Nth roots of unity. Circular measure. Trigonometric functions of angles of any magnitude. Addition and factor formulae.

200 Level

GST 212: Philosophy, Logic and Human Existence

(2 Units C: LH 30)

Learning Outcomes

A student who has successfully gone through this course should be able to:

1. appreciate the basic features of philosophy as an academic discipline;
2. identify the main branches of philosophy & the centrality of logic in philosophical discourse;
3. know the elementary rules of reasoning;
4. distinguish between valid and invalid arguments;
5. think critically and assess arguments in texts, conversations and day-to-day discussions;
6. critically assess the rationality or otherwise of human conduct under different existential conditions;
7. develop the capacity to extrapolate and deploy expertise in logic to other areas of knowledge; and
8. guide his or her actions, using the knowledge and expertise acquired in philosophy and logic.

Course Contents

Scope of philosophy; notions, meanings, branches and problems of philosophy. Logic as an indispensable tool of philosophy. Elements of syllogism, symbolic logic— the first nine rules of inference. Informal fallacies, laws of thought, nature of arguments. Valid and invalid arguments, logic of form and logic of content — deduction, induction and inferences. Creative and critical thinking. Impact of philosophy on human existence. Philosophy and politics, philosophy and human conduct, philosophy and religion, philosophy and human values, philosophy and character molding and many others.



ENT 211: Entrepreneurship and Innovation

(2 Units C: LH 30)

Learning Outcomes

At the end of the course, students should be able to:

1. define Entrepreneurship;
2. explain the characteristics of Entrepreneurship and Success secrets;
3. describe the Theories and Psychology of Entrepreneurship;
4. explain the Theories and Psychology of Entrepreneurship;
5. describe the forms of Business Classification and Ownership;
6. explain the Scale of Business Operations and Locations; and
7. explain the Process of Establishing a Business and Practical Registration of a Business Enterprise.

Course Contents

This course is designed to be the student' second encounter with the ECSA Programme and business/enterprise creation is expected to form its focus of attention. At the end of this course, every student is expected to have conceived and registered a business enterprise or an organisation to be used as the vehicle for the actualization of the dream product (idea) approved at the end of the first semester course GNS 203. The students are to be taken through: Definition and Conceptual Clarification of Entrepreneurship, The Characteristics of Entrepreneurship and Success Secrets, Theories and Psychology of Entrepreneurship, Definition of Business (the Enterprise, the Activity), Business: Its Characteristics and Objectives, Business Classification and Ownership Forms, The Scale of Business Operations and Locations, The Theory of the Business, The process of establishing a business and practical registration of a business enterprise.

COS 201: Computer Application

(2 Units C: LH 15; PH 45)

Learning Outcomes

At the end of the course, the students should be able to:

1. explain the concept and scope of information technology;
2. describe the basics of information processing and information transmission;
3. appreciate the methods of computer organisation;
4. demonstrate knowledge of various components of the computer; and
5. apply practical knowledge of computer operations.

Course Contents

Content (theory): concept and scope of information technology, Computers for information storage, information seeking, and information processing and information transmission. Elements of computer system, computer hardware and software. Numeric data, alpha numeric data. Contents of a program and processing. Computer organisation, block diagram of a computer, CPU, memory. Input devices. Keyboard, mouse and many others. output devices, VDU and Printer, Scanner and Plotter. Electrical requirements, inter-connections between units, connectors and cables. Secondary storage: magnetic disks – tracks and sectors, optical disk (CD and DVD Memory), primary and secondary memory: RAM, ROM, PROM and many others. Capacity; device controllers, serial port, parallel port, system bus. Exercises on file opening and closing. Memory management. Device management and input – output (I/O) management with respect of windows. Installation concept and precautions to be observed while installing the system and software. Introduction about Operating Systems such as MS-DOS and Windows. Special features,



various commands of MS word and MS-Excel. About the internet – server types, connectivity (TCP/IP, shell). Applications of internet like: e-mail and browsing. Various Browsers like WWW (World Wide Web). Hyperlinks; HTTP (Hyper Text Transfer Protocol). FTP (File Transfer Protocol). Basics of Networking – LAN, WAN and Topologies.

Practical: Given a PC, name its various components and list their functions. Identification of various parts of a computer and peripherals. Practice in installing a computer system by giving connection and loading the system software and application software. Installation of DOS and simple exercises on TYPE, REN, DEL, CD, MD, COPY, TREE, BACKUP commands. Exercises on entering text and data (Typing Practice). Installation of Windows 98 or 2000 and many others. Features of Windows as an operating system: Start, Shutdown and restore, Creating and operating on the icons, Opening closing and sizing the windows, Using elementary job commands like – creating, saving, modifying, renaming, finding and deleting a file, Creating and operating on a folder, Changing setting like, date, time color (back ground and fore ground), Using short cuts, Using on line help.

MS-WORD: File Management: Opening, creating and saving a document, locating files, copying contents in some different file(s), protecting files, Giving password protection for a file, Page Set up: Setting margins, tab setting, ruler, indenting, Editing a document: Entering text, Cut, copy, paste using tool-bars, Formatting a document: Using different fonts, changing font size and colour, changing the appearance through bold/ italic/ underlined, highlighting a text, changing case, using subscript and superscript, using different underline methods: Aligning of text in a document, justification of document, Inserting bullets and numbering, Formatting paragraph, inserting page breaks and column breaks. Use of headers, footers: Inserting footnote, end note, use of comments, Inserting date, time, special symbols, importing graphic images, drawing tools, Tables and Borders. Creating a table, formatting cells, use of different border styles, shading in tables, merging of cells, and partition of cells, inserting and deleting a row in a table. Print preview, zoom, page set up, printing options, Using Find, Replace options, Using Tools like: Spell checker, help, use of macros, mail merge, thesaurus word content and statistics, printing envelops and labels. Using shapes and drawing toolbar, Working with more than one window in MS Word, How to change the version of the document from one window OS to another.

ANA 201: Introductory Anatomy & Gross Anatomy of Upper and Lower Limb (2 Units C: LH 15; PH 45)

Learning Outcomes

At the end of the course, students should be able to:

1. define fundamental anatomical terminology and discuss the anatomical position;
2. describe the anatomy of the musculoskeletal system, including the axial skeleton; appendicular skeleton, appendicular and axial muscles, and arthrology;
3. describe the general features of the bones of the upper and lower limbs;
4. identify the major muscles of the upper and lower limbs;
5. explain the types and structure of the joints of the upper and lower limbs;
6. correlate between the attachment of the muscles and their functions on the different joints;
7. identify the major nerves of the upper and lower limbs;
8. describe the functional components of each of the major nerves and its distribution;
9. identify and describe the course of the major superficial veins of the upper and lower limbs; and
10. name the major arteries of the upper and lower limbs.



Course Contents

Descriptive terms, plans and terms of relationship of the human body, terms of comparison, attachment of muscles, types of muscles, movements of joints. Osteology, principles of kinesiology, general organisation of body system. Cutaneous innervation of the upper limb; pectoral region; breast; axilla; shoulder region; arm and cubital fossa; flexor compartment of forearm; extensor compartment of forearm; hand; venous and lymphatic drainage of the upper limb. Applied anatomy of nerves; blood supply of the upper limb. Cutaneous innervation of the lower limb; femoral triangle; adductor canal and medial side of the thigh; gluteal region; back of the thigh, popliteal fossa; extensor compartment of the leg and dorsum of the foot; peroneal and flexor compartment of the leg; sole of the foot, arches of the foot; mechanism of walking; venous and lymphatic drainage of the lower limb; applied anatomy of the nerves and blood supply to the lower limb.

MCB 201: General Microbiology

(2 Units C: LH 30)

Learning Outcomes

At the end of the course, students should be able to:

1. explain the history and scope of Microbiology;
2. describe the morphology and cell structure of the different microbes;
3. identify the ecology of different microbes; and
4. demonstrate the knowledge of the prevention and control of Microbial diseases.

Course Contents

History and scope of microbiology. The general characteristics of microorganisms. Prokaryotic and eukaryotic microorganisms. Bacterial morphology and cell structure. Growth and Reproduction of microorganisms. Microbial metabolism, antimicrobial agents. Systematic classification of bacteria, fungi, viruses, algae and protozoa. Microbial ecology, Microbial growth and identification, Prevention and Control of microbial diseases, microbes in relation to environment agriculture and industries and many others.

MCB 203: Microbiology Practical

(1 Unit C: PH 45)

Learning Outcomes

At the end of the course, students should be able to:

1. demonstrate cognate skills in microbial techniques in instrumentation;
2. demonstrate cognate skills in isolation of microbes; and
3. demonstrate competencies in the identification of microbes in different environmental media.

Course Contents

Students should acquaint themselves with the microbial techniques involving the use of instrumentation, isolation and identification of microbes in different environmental media.



BCH 201: General Biochemistry I

(2 Units C: LH 30)

Learning Outcomes

At the end of the course, students should be able to:

1. explain the structure of different macromolecules in biological system;
2. identify types of chemical reactions involving these macromolecules;
3. explain the various methods of isolation of these macromolecules;
4. estimate the effects of acids and alkalis on the macromolecules;
5. describe purification of macromolecules; and
6. discuss quantification of the various macromolecules.

Course Contents

Introductory chemistry of amino acids, their properties, reactions and biological functions. Classification of amino acids: neutral, basic and acidic; polar and non-polar; essential and non-essential amino acids. Peptides. Introductory chemistry and classification of proteins. Biological functions of proteins. Methods of their isolation, purification and identification. Primary, secondary, tertiary and quaternary structures of proteins. Basic principles of tests for proteins and amino acids. Introductory chemistry of carbohydrates, lipids and nucleic acids. Nomenclature of nucleosides and nucleotides, effects of acid and alkali on hydrolysis of nucleic acids.

BCH 203: General Biochemistry Practical

(1 Unit C: PH 45)

Learning Outcomes

At the end of the course, students will be able to understand the various laboratory procedures used in the study of various biochemical processes described in BCH 201 and 202.

Course Contents

Laboratory experiments designed to reflect the topics covered in BCH 201 and BCH 202. Introduction to laboratory methods and procedures employed in studying biochemical processes.

POI 201: Introductory Physiology and Blood

(2 Units C: LH 15; PH 45)

Learning Outcomes

At the end of the course, students should be able to:

1. describe the composition of a cell membrane;
2. explain how a potential difference across a membrane will influence the distribution of a cation and an anion;
3. describe how transport rates of certain molecules and ions are accelerated by specific membrane transport proteins;
4. distinguish between active (primary and secondary) transport, facilitated diffusion, and passive diffusion based on energy source and carrier protein involvement;
5. identify the mechanisms and role of selective transporters for amino acids, neurotransmitters, nutrients, etc;
6. describe the general concepts of homeostasis and the principles of positive and negative feedback in physiological systems;
7. identify the site of erythropoietin production, the stimulus for its release, and the target tissue for erythropoietin action;



8. discuss the normal balance of red blood cell synthesis and destruction, including how imbalances in each lead to anemia or polycythemia;
9. list and differentiate the various types of leukocytes;
10. describe the role of thrombocytes in haemostasis; and
11. list clotting factors and the discuss the mechanism of anti-coagulants.

Course Contents

Introduction and history of physiology. Structure and functions of cell membranes. Transport process, special transport mechanism in amphibian bladder, kidney, gall bladder, intestine, astrocytes and exocrine glands. Biophysical principles. Homeostasis and control systems including temperature regulation, biological rhythms, composition and functions of blood haemopoiesis. WBC and differential count, plasma proteins, coagulation fibrinolysis and platelet functions. Blood groups – ABO system – Rh system – blood transfusion – indication for collection and storage of blood, hazards of blood transfusions. Reticulo-endothelial system, immunity and immunodeficiency disease and HIV.

EHS 201: Introduction to Environmental Health

(2 Units C: LH 30)

Learning Outcomes

At the end of the course, students should be able to:

1. define environmental health;
2. distinguish the components of environmental health and environmental sanitation;
3. identify the roles of environmental health in disease prevention and control;
4. describe the qualities, skills and competencies of an environmental health practitioner/officer in the provision of quality environmental health services;
5. explain the roles of environmental health practitioner in health promotion, disease prevention and control;
6. discuss environmental health functions in different settings;
7. appraise common tools used in environmental health practice;
8. discuss the environmental health service delivery system in Nigeria;
9. list the ethics of environmental health profession in Nigeria;
10. discuss the role of EHORECON in the regulation of environmental health profession in Nigeria;
11. outline professional associations in environmental health in Nigeria; and
12. assess the career path/progression in environmental health.

Course Contents

Concept of environmental health, and environmental sanitation, Components of environmental health. Components of environmental sanitation. Role of environmental health in disease prevention and control. Qualities of an environmental health practitioners/officers; environmental health practice. Environmental health functions in different settings (home, schools, market places, recreational and hospitality facilities, workplace, industries). Environmental health practice tools, qualities, skills and competencies of environmental health practitioners/officers, environmental health regulation. Ethics in environmental health practice. Inter and intra sectoral collaboration in environmental health practice environmental health service delivery system- federal, state, LGA and private; career path/progression in environmental health.

EHS 202: Fundamentals of Epidemiology

(2 Units C: LH 30)



Learning Outcomes

At the end of the course, students should be able to:

1. explain the basic principles of disease investigation and control;
2. describe types of epidemiological studies;
3. construct the etiological relationships in disease occurrence;
4. evaluate the mode of disease transmission;
5. explain basic epidemiological study designs-cross sectional studies, cohort or prospective studies, case-control studies and many others;
6. organise disease epidemiological survey;
7. examine disease causation models;
8. analyse the epidemiological triad;
9. discuss disease occurrence;
10. design measures in disease prevention and control;
11. distinguish quantitative and qualitative assessment of screening procedures;
12. measure cause-effect relationship and;
13. explain dose-effect and dose-response relationship;
14. construct an epidemiological curve;
15. determine the cyclicity in disease occurrence;
16. analyse the measurements of health status of a community;
17. explain exposure assessment;
18. state what is attributable risk assessment?;
19. organise an epidemiological investigation and reporting;
20. compare accident and injuries; and
21. explain differences between incidence and prevalence rates.

Course Contents

Historical development, definition, type, scope and application of epidemiology. Introduction to the basic principles and methods of epidemiology. Epidemiologic model of disease occurrence. Causal inferences in disease causation – unifactorial model, multi-factorial model, Web of causation, criteria for asserting etiological relationships in disease occurrence. Agent-host environment relationships in disease occurrence. Person-time-place descriptive epidemiological model. time-relationships in disease occurrence – natural history of disease, time of onset of a disease, time of diagnosis of disease, incubation period, time incidence function of a disease, mode of transmission of disease, epidemic curves, epidemiologic year of a disease, cyclicity (secular versus seasonal) in disease occurrence. Strategies and methods in the prevention and control of diseases. Quantitative and qualitative assessment of screening procedures and their strength. Measurement of health status. Assessment of etiologic relationships based on exposure and susceptibility factors – relative risk, attributable risk, attributable risk percent, population attributable risk and odds ratio. Basic epidemiologic study designs – cross-sectional studies, cohort or prospective studies, case-control studies, randomized clinical trials and community trials. Investigation and reporting of disease outbreak. Survey of the applications of epidemiology to diseases, injuries, and non-disease health problems, cause effect relationship.

EHS 204: Ecology and Environmental Management

(1 Unit C: LH 45)

Learning Outcomes

At the end of the course, students should be able to:

1. define ecology and environmental management;



2. explain the basic environmental concepts, theories and types of ecology;
3. analyse the local and global scales of environmental health issues;
4. relate the physical, chemical, and biological components of the environment and how they interact together;
5. appraise the energy flow through the biosphere, biotic communities and ecological succession;
6. describe sources of environmental pollution;
7. discuss common environmental pollutants;
8. take part in pollution control and prevention activities;
9. discuss Environmental Management Systems; and
10. outline the structure of an Environmental Management Plan.

Course Contents

Introduction to ecology and environmental management, nature of our environment: the earth. Atmosphere, biosphere, stratosphere and many others. Chemical, physical and biological factors in the environment. Biogeochemical cycles: carbon cycle, Nitrogen cycle, Hydrological cycle. Basic environmental concepts and theories. Global environmental health issues. Microbial and parasite ecology. Population ecology; -, food chain and web. Energy flow through the biosphere. Biotic communities and ecological succession. Relationships and interdependence of organisms. Human ecology. Introduction to environmental pollution and many others. Environmental Management Systems. Environmental Management Plan.

EHS 208: Health Psychology and Sociology

(2 Units C: LH 30)

Learning Outcomes

At the end of the course, students should be able to:

1. explain the concept of health psychology, health sociology and anthropology;
2. discuss the biological basis for human behaviour;
3. describe human development, learning and practices;
4. assess the role of culture, communication and human relationship in relation to public participation;
5. demonstrate the importance of indigenous or local knowledge, beliefs and health practices;
6. contrast social, psychological and biological aspects of environmental health planning and built environment;
7. classify the factors responsible for substance use and abuse;
8. elaborate inequalities in health;
9. outline the sources of psychological disorders such as stress and many others;
10. evaluate illness and sickness behaviour;
11. justify the role of human behaviours in illness and disease causation;
12. carryout counselling on common psychological disorders in the community;
13. plan needs assessment and social epidemiology; and
14. analyse the social determinants of Health, and Health service utilisation behaviour.

Course Contents

Introduction to sociology, psychology and anthropology. Biological basis for human behaviour– sensation, perception. Motivation and emotion. Describe human development, learning and practices. Role of culture, communication and human relationship and public participation. Importance of indigenous knowledge, belief and health practices. Social, psychological and



biological aspect of environmental planning and built-up environment, substance use and abuse. Inequalities in health, psychological disorders, stresses, illness behaviours in relation to social medicine and medical psychology. Role of human behaviours in illness and disease causation. Social determinants of health, social epidemiology and health service utilisation behaviours. Application of social science theories towards understanding behavioural aspects of health and medical care. Considerations of human behavioural dimensions in illness and disease, prophylactic behaviour, the role of culture, role of social institutions, stress and health, compliance behaviours, social epidemiology and many others. Also covers topics in social health including smoking, alcoholism, drug addiction, obesity and nutritional behaviour/disorders, health services utilisation behaviour, emotional health and personality disorders, religion and health.

EHS 212: Biostatistics

(2 Units C: LH 30)

Learning Outcomes

At the end of the course, students should be able to:

1. define the following terms: Statistic, statistics and data;
2. enumerate the types of data and their classification;
3. illustrate measures of central tendency;
4. comprehend sample and sampling techniques;
5. distinguish descriptive and inferential statistics;
6. importance of vital statistics in environmental health;
7. describe different methods of data collection and presentation used in health research;
8. apply statistical packages used in EH research such as SPSS, epi-info, epidata, stacia; and
9. calculate Disease, Death Rates and many others.

Course Contents

Definition, types of data, classification and types of samples, sampling techniques data distribution descriptive and inferential statistics. Vital and health statistics. Use of computer based statistical packages – such as statistical package for social sciences (SPSS), epi-Info, epidata, strata, R, stacia, and many others. and many others Calculate rates: Attack rate, infection rate, contamination rate, Death rate, Crude Death Rate and many others.



EHS 218: Introduction to Engineering Drawing & Design

(2 Units C: LH 30)

Learning Outcomes

At the end of the course, students should be able to:

1. explain the concept of engineering drawing.
2. apply paper format.
3. explain types of lines and their uses in drawing.
4. employ requisite instruments for drawing.
5. handle different drawing formats.
6. describe the various methods of formats construction.
7. explain the paths of points and their moving links.
8. discuss the theory of projection.
9. interpret multiple projections; and
10. display angle representations.

Course Contents

Revision of multi-view representation. Harder examples on two and three view representation (1st and 3rd angle). Harder examples on isometric drawing to include simple pictorial assembly drawing in isometric. Harder examples on oblique drawing (Cavalier, Cabinet and Angles other than 45 degrees). Dimensioning. Sections and Conventions. Auxilliary views. Representation and specification of threads. Bolted joints. Keys and cottered joints. Conventional representations.

300 Level

GST 312: Peace and Conflict Resolution

(2 Units C: LH 30)

Learning Outcomes

At the end of the course, students should be able to:

1. analyse the concepts of peace, conflict and security.
2. list major forms, types and root causes of conflict and violence.
3. differentiate between conflict and terrorism.
4. enumerate security and peace building strategies; and
5. describe roles of international organisations, media and traditional institutions in peace building.

Course Contents

Concepts of Peace, Conflict and Security in a multi-ethnic nation. Types and Theories of Conflicts: Ethnic, Religious, Economic, Geo-political Conflicts. Structural Conflict Theory, Realist Theory of Conflict, Frustration-Aggression Conflict Theory. Root causes of Conflict and Violence in Africa: Indigene and settlers Phenomenon, Boundaries/boarder disputes, Political disputes, Ethnic disputes and rivalries, Economic Inequalities, Social disputes, Nationalist Movements and Agitations. Selected Conflict Case Studies – Tiv-Junkun; Zango Kartaf, Chieftaincy and Land disputes and many others. Peace Building, Management of Conflicts and Security: Peace & Human Development. Approaches to Peace & Conflict Management --- (Religious, Government, Community Leaders and many others). Elements of Peace Studies and Conflict Resolution: Conflict dynamics assessment Scales: Constructive & Destructive. Justice and Legal framework: Concepts of Social Justice; The Nigeria Legal System. Insurgency and Terrorism. Peace Mediation and Peace Keeping. Peace & Security Council (International, National and Local levels) Agents of



Conflict resolution – Conventions, Treaties Community Policing: Evolution and Imperatives. Alternative Dispute Resolution, ADR. Dialogue b). Arbitration, c). Negotiation d). Collaboration and many others. Roles of International Organisations in Conflict Resolution: (a). The United Nations, UN and its Conflict Resolution Organs. (b). The African Union & Peace Security Council (c). ECOWAS in Peace Keeping. Media and Traditional Institutions in Peace Building. Managing Post-Conflict Situations/Crisis: Refugees. Internally Displaced Persons, IDPs. The role of NGOs in Post-Conflict Situations/Crisis.

ENT 312: Venture Creation

(2 Units C: LH 15; PH 45)

Learning Outcomes

At the end of this course, students, through case study and practical approaches, should be able to:

1. describe the key steps in venture creation;
2. spot opportunities in problems and in high potential sectors regardless of geographical location;
3. state how original products, ideas, and concepts are developed;
4. develop business concept for further incubation or pitching for funding;
5. identify key sources of entrepreneurial finance;
6. implement the requirements for establishing and managing micro and small enterprises;
7. conduct entrepreneurial marketing and e-commerce;
8. apply a wide variety of emerging technological solutions to entrepreneurship; and
9. appreciate why ventures fail due to lack of planning and poor implementation.

Course Contents

Opportunity Identification (Sources of business opportunities in Nigeria, Environmental scanning, Demand and supply gap/unmet needs/market gaps/Market Research, Unutilised resources, Social and climate conditions and Technology adoption gap). New business development (business planning, market research). Entrepreneurial Finance (Venture capital, Equity finance, Micro finance, Personal savings, Small business investment organisations and Business plan competition). Entrepreneurial marketing and e-commerce (Principles of marketing, Customer Acquisition & Retention, B2B, C2C and B2C models of e-commerce, First Mover Advantage, E-commerce business models and Successful E-Commerce Companies,). Small Business Management/Family Business: Leadership & Management, Basic book keeping, Nature of family business and Family Business Growth Model. Negotiation and Business communication (Strategy and tactics of negotiation/bargaining, Traditional and modern business communication methods). Opportunity Discovery Demonstrations (Business idea generation presentations, Business idea Contest, Brainstorming sessions, Idea pitching). Technological Solutions (The Concept of Market/Customer Solution, Customer Solution and Emerging Technologies, Business Applications of New Technologies - Artificial Intelligence (AI), Virtual/Mixed Reality (VR), Internet of Things (IoTs), Blockchain, Cloud Computing, Renewable Energy and many others. Digital Business and E-Commerce Strategies).



EHS 301: Basic Instrumentation and Use

(2 Units C: LH 15; PH 45)

Learning Outcomes

At the end of this course, students should be able to:

1. explain the term instrument and instrumentation;
2. describe basic instruments used in environmental health;
3. discuss the principles, applications and precautions in the use of field and laboratory instruments in EH;
4. demonstrate the calibration of instruments;
5. conduct Air quality sampling using hand held equipment;
6. discuss Analytical methods;
7. outline the methods used in the maintenance of basic instruments;
8. identify various Standard operating procedures in the use of basic instruments;
9. discuss safety management in the use of basic instruments; and
10. explain documentation and reporting in the use of basic instruments.

Course Contents

Introduction to basic instrumentation in environmental health principles. use and maintenance of laboratory and field instruments in environmental health:- Centrifuge, Refrigerator, Deep freezer, Hot Air Oven, Spectrophotometer (VIS & UV), Colorimeter, Water distiller, Incubator, Semi Auto-Analyser, Hot plate, heater, Water bath, Fume chamber, Electrophoretic tanks (*Shandon model*), Electronic weighing balance (Top load), Hematological Analyser, Thermostat oven, Fume cupboard, Magnetic hot plate, Temperature control oven, Heating mantle, Microscopes(camera, teaching and many others); Reverse Transcription-Polymerase Chain Reaction (RT-PCR) Machine, Colorimeter (Hand held), Autoclave, Dessicators, Rotators, De-ionizer, Distiller machine, Hood fume cabinet, Laminar flow hoods, Atomic Absorption Spectrophotometer (AAS), Light meters and Luminance meters, Anemometers, Manometers, Magnifying Lens, Food probes Thermometer, Refractometer, Dust detector, Ozone monitor, Radiation monitors, Flame Ionization detector (FID), Global Position Systems (GPS) and remote sensing, Gas chromatography, Toxic gas meters, Combustible gas and Oxygen meters, Infrared Analyzers, Isocyanate monitors, Heat stress monitor, Volatile organic compounds Monitors (VOCs), Smoke generators, Spirometer, Audiometer, Blood gas meter, Gas analyser -CO, CO₂, NO₄, SO₄, H₂S, Methane, Particulate meter 2.5 & 10, Gel electrophoresis apparatus, magnetic stirrer, vortex mixer and many others; Documentation, preservation and transportation; calibration, maintenance of basic instruments; standard operating procedures in the use of basic instruments; safety management; documentation and reporting.

EHS 307: Introduction to Primary Health Care

(2 Units C: LH 15; PH 45)

Learning Outcomes

At the end of this course, students should be able to:

1. define the following terms: PHC, immunology, universal health coverage, immunisation, vaccination;
2. explain the principles of PHC;
3. discuss history and evolution of PHC;
4. enumerate the components of PHC in Nigeria;
5. appraise the structure in PHC delivery;
6. enumerate the elements of PHC;
7. explore the principle and application of oral rehydration therapy;



8. discuss disease surveillance;
9. assess cold chain management in PHC system;
10. identify the objectives and administration of essential drugs supply;
11. analyse the methods in the control of common endemic diseases;
12. evaluate the concepts of reproductive health, maternal and child health;
13. conduct basic SWOT analysis;
14. plan national immunization schedule;
15. determine the role of EHOs in PHC system; and
16. discuss the Basic Healthcare Provision Fund.

Course Contents

Development of health system, concept and principles of primary health care services. History and evolution of PHC; components of PHC. Structures and organogram. Elements of PHC, oral re-hydration therapy, screening, disease surveillance, immunology and immunization techniques, cold chain technology, essential drugs: drug revolving fund, control of common endemic diseases, reproductive health, maternal and child health and many others. Resources for PHC delivery, Strengths, Weaknesses, Opportunities & Threats (SWOT) analysis of PHC. Participatory techniques in PHC delivery. Maternal and child survival strategies and many others; Basic Healthcare Provision Fund.

EHS 311: Introduction to Environmental Management

(2 Units C: LH 30)

Learning Outcomes

At the end of this course, students should be able to:

1. define the following terms: pollution; environmental pollution; environmental management system, environmental degradation and environmental management;
2. explain the following concepts: Environmental Audit, Environmental Health Impact Assessment health Impact Assessment, Geographic Information System, remote sensing;
3. discuss the effects of technological advances on the environment;
4. elaborate the different methods of waste management;
5. describe global warming;
6. discuss the control measures of global warming;
7. state the principles and objectives of Environmental Health Impact Assessment in Nigeria;
8. classify mycotoxins;
9. identify the effects, signs and symptoms of mycotoxins in food and environment;
10. analyse the impacts of environmental degradation;
11. explain environmental management system;
12. discuss the economics of environmental management;
13. classify environmental pollution;
14. discuss chemicals of emerging concerns (CECs); and
15. explain nanotechnology and nanomaterials.



Course Contents

Definition and concept. Characteristics of different environmental media (air, water, soil). Environmental approach to air, water and land pollution. Environmental effects of technological advances, radiation, noise, vibration, pollution of the biosphere. Concept of environmental management system. Mycotoxins and nitro-compounds in the environment. Environmental degradation. Methods of environmental assessment such as remote sensing and GIS, EA, EHIA, HIA. Economics of environmental management. Tools for Air, water and soil analyses. Management of degraded environment, re-forestation, erosion control, waste management, pollution control, international measures to control global warming and climate change remediation, meteorology. Chemicals of Emerging Concerns (CECs); Nanotechnology and nanomaterials.

EHS 315: Health, Safety and Environment

(2 Units C: LH 15; PH 45)

Learning Outcomes

At the end of this course, students should be able to:

1. explain the following terms; Health, safety, Environment, occupation, occupational health, ILO, WHO and many others;
2. state the principles, objectives and application of HSE;
3. examine the history of HSE and OHS in Nigeria;
4. evaluate the concept of HSE and OHS;
5. differentiate between HSE and OHS;
6. list the statutory requirements of HSE;
7. discuss the responsibilities of EHPs/EHOs in HSEMS;
8. determine the common health problems in a work environment;
9. formulate HSE checklist;
10. explain general and basic safety rules;
11. discuss different types of ppe and their use;
12. explain environmental pollution and contamination;
13. discuss hazard prevention and management;
14. evaluate Risk Management;
15. explore Risk Assessment techniques;
16. undertake Risk Analysis in a given environment; and
17. describe the process of Risk Communication.

Course Contents

Concept of HSE, principles and objectives of Health, Safety & Environment (HSE). history of HSE, occupational health and safety, terminologies- HSE, Job Hazard Analysis (JHA), Hazards and Effects Management Process (HEMP), hierarchy control measures, Role of HSE, relationship between health, safety and environment; policies, statutory requirements such as policy, implementation plan, personnel and many others. Scope, HSE management system. Principles and approaches. HSE training, HSE manual, Responsibilities of EHPs/EHOs in Health, Safety & Environment Management Systems (HSEMS), HSE checklist, general and basic safety rules, first aid, Personal protective equipment (PPE), Environmental pollution. Environmental contamination, security in the field, measures in the containment of actions; Hazard Prevention and management; occupational safety. Risks - As Low As Reasonably Practicable (ALARP); Risk Management: Risk Assessment; Risk Analysis; Risk Communication.



Learning Outcomes

At the end of this course, students should be able to:

1. define the following concept food, food hygiene, food safety, food security, food poisoning, wholesome and unwholesome food and many others;
2. describe the importance of food hygiene and safety;
3. list the objectives of food hygiene and safety;
4. explain the concept of food chain and food security;
5. discuss the factors contributing to the standard of food hygiene in Nigeria;
6. outline food premises inspection procedure;
7. examine the principles, objectives and application of HACCP;
8. conduct inspection of food, food premises, food handlers, hygiene and health requirements of food handlers;
9. carry out meat hygiene and inspection;
10. investigate food poisoning and infections using different food quality control approaches;
11. identify foods that could pose risk to health through its physical, chemical and biological content;
12. explain how to collect, preserve, transport and analyze food sample;
13. apply food safety and hygiene laws, policies and regulations such as Public Health laws, National environmental health regulations, national policy guideline on food sanitation;
14. organise training for food handlers on food hygiene and safety;
15. identify regulatory agencies and their functions in maintaining food safety;
16. discuss food preservation methods;
17. outline classes of food by form, nutrient content and many others;
18. examine food registration requirements;
19. explain the procedure for inspecting food preparing and vending premises;
20. explain food contamination;
21. enumerate food handling equipment;
22. describe equipment and instruments used in food inspection;
23. explain food waste collection and disposal procedures;
24. enumerate relevant food safety and hygiene policies, laws & regulations;
25. outline food-borne illnesses and their control measures;
26. explain the procedure for the cleaning of food premises;
27. discuss the basic measures of pest control in food premises; and
28. explain food allergies.

Course Contents

Concept of Food chain and food security, food classification by nutrient content – Carbohydrate, Protein, Fat & Oil and many others. Beverages. Cereals. Legumes. Sea food and many others. cooked food. raw food. Processed food. Food hygiene, food production, handling, transportation, storage, preparation. food premises, sanitary requirements of food premises, food vendors. Food handlers, hygiene and health requirements of food handlers. Food processing; food spoilage; food preservation - refrigeration, smoking, drying, dehydration and many others. Food handling equipment and use. Food poisoning and food infections, prevention and control of food-borne illnesses (FBIs). Food allergies. Food safety – farm to fork concept. Food quality control – Quality assurance. Food inspection, sampling of food, food registration and licensing, principles and application of Hazard Analysis Critical Control Points (HACCP). High risk foods, food safety laws



and regulations. Licensing of food-preparing and water packaging premises. Licensing of liquor-selling premises. Organisation of training programme for food handlers on food safety and hygiene. Meat hygiene and inspection. Regulatory agencies and their functions – National Agency for Food Administration and Control (NAFDAC), Standards Organisation of Nigeria (SON), Federal Competition and Consumer Protection Council (FCCPC), Environmental Health Officers Registration Council of Nigeria (EHORECON), Food safety and hygiene policies, laws and regulations – National Food Safety Policy, National Policy Guidelines on Food Safety and Hygiene, National Environmental Health Practice Regulations and many others; Food contamination; Food contaminants – physical, biological, chemical. Equipment and tools used in food safety and hygiene inspection – thermometer, turbidity metre and many others; food waste collection and disposal. Good hygiene practices, good manufacturing practices, cleaning of food premises, pests associated with the food premises.

EHS 306: Sanitary Inspection of Premises and Audit (2 Units C: LH 15; PH 45)

Learning Outcomes

At the end of this course, students should be able to:

1. define the following terms: premises, inspection, sanitary conveniences, ethics, and many others;
2. outline the objectives of sanitary inspection of premises;
3. describe the procedure and methodology of sanitary inspection of premises;
4. discuss ethical issues in SIP and audit;
5. classify premises into residential, institutional, commercial and many others;
6. identify and use modern equipment for conducting SIP and audit;
7. plan, inspect and report SIP and audit activities;
8. upload SIP report into EHMIS;
9. apply the laws, policies and regulations in SIP and audit;
10. justify the qualities of inspecting officer;
11. discuss right of entry of EHP;
12. outline the procedure of enforcing non-compliance to SIP and audit;
13. discuss the communication procedures in SIP and audit;
14. describe Environmental Surveillance tools;
15. outline equipment and instrument used in SIP/A;
16. explain the role of private sector in SIP;
17. highlight on the procedure for Certification of Premises;
18. determine Hygiene Rating for Premises; and
19. identify various types of nuisances/inspection parametres.



Course Contents

Concept and principles of inspections. Definitions –Inspection, Sanitary Inspection of Premises (SIP), Sanitary Audit (SA) Standards. Guidelines, Purpose, Objectives of inspection, Procedure and methodology of premises inspection. Ethical issues in sanitary inspection of premises - fairness, objectivity, honesty, openness and many others. Types of premises: residential, commercial, industrial, recreational, hospitality; institutional, mobile premises and special event. Environmental surveillance tools: Tools (form ES 1, 215); equipment (camera, GPS kits, metre rule, torch light and many others) and instruments (hand held noise level meter, thermometer, air quality monitors, contamination metre [Adenosine Triphosphate (ATP), and many others] for sanitary inspection of premises (SIP); Planning for SIP- area mapping, plan of action, budget, resource mobilisation and utilisation, Strategy for SIP; Qualities of inspecting officer, inspection skills - thoroughness, accuracy and many others. Report writing and dissemination (Environmental Health Management Information System, Local Data Base, web portal, reporting tools; laws, policies, regulations, guidelines and enforcement. Nuisance: types of nuisance – structural nuisance, non-structural nuisance, statutory nuisance; Abatement of nuisance – Abatement Notice, Improvement Notice; Communication on SIP- Behaviour Change Communication (BCC); Target parameters/Nuisances for inspection: Sanitary situation, Toilet facilities (Availability/Access/Cleanliness/Adequacy), Noise level, Temperature, Humidity, Pest & vector infestation, microbial contamination, congestion, water safety waste disposal, crowding, Lighting, Ventilation, Records & Certifications and many others. Certification of Premises – Certificate of Fitness for Habitation; Certificate of Fitness for Use; Certificate of Fitness for Continued Use; Private Sector Participation (PSP) in SIP/A; National Policy Guidelines on Sanitary Inspection of Premises.

EHS 312: Housing and Health

(2 Units C: LH 15; PH 45)

Learning Outcomes

At the end of this course, students should be able to:

1. define the following terms: housing, house, building, shelter and accommodation, urban, slum, urban squalor;
2. explain building codes and its application in day to day environmental health practice;
3. explain the characteristics of urban and rural housing;
4. identify different types of houses- bungalow, duplex, houses in multiple occupation, mall, schools, hospital, hotel, huts and many others;
5. list sanitary requirements of a house and their public health importance;
6. distinguish between poor housing and diseases occurrence;
7. analyse public health concerns in building plans and solutions;
8. determine the steps in building site inspection;
9. enumerate structural defects in buildings and recommendation;
10. support inter-sectorial collaboration among stakeholders in building sectors;
11. list common building laws and regulations in Nigeria;
12. outline the effects of poor housing on health;
13. determine level of overcrowding in buildings;
14. discuss the factors in housing which lead to morbidity and mortality;
15. explain public health aspects of the building code;
16. enumerate hazards associated with poor housing;
17. analyse housing-associated emergencies and risks;
18. itemise the importance of building inspection and reporting;



19. discuss Housing Health Rating System;
20. outline attributes of a healthy house; and
21. differentiate building decommissioning; building demolition and building collapse.

Course Contents

Introduction to housing. Housing standards. Urban and rural housing. Health requirements of housing – physical, physiological, psychological. Building types – commercial, residential, institutional, industrial, recreational, combined use and many others. use of building certifications. Building site selection. Building technology- drawing and reading of plan. Housing/building codes, edicts, or ordinances, laws and legislation of the various government levels. International and national legislations on housing. Criteria for building approval. Role of environmental health professionals in building approval and registration. Effects of poor housing on health. Overcrowding, slum settings, morbidities, mortalities, accidents, building defects. Public health aspects of the building code. Hazards associated with poor housing. Housing-associated emergencies. Building inspection and reporting. Housing Health Rating System. Attributes of a healthy house. Remedy to building defects. Building decommissioning. Building demolition. Building collapse.

EHS 318: Environmental Sanitation And Hygiene

(2 Units C: LH 15; PH 45)

Learning Outcomes

At the end of this course, students should be able to:

1. define the following terms: environment, environmental sanitation, sanitation;
2. list the components of environmental sanitation in Nigeria;
3. discuss the principles and application of CLTS;
4. explain the process involved in burial and disposal of the dead;
5. outline the techniques involved in promoting community sanitation;
6. describe sanitation advocacy using various media;
7. illustrate the method involved in quantifying silt, refuse, sewage and many others;
8. discuss National Policy on Environmental Sanitation;
9. discuss the factors responsible for poor sanitation in Nigeria;
10. discuss marketing sanitation;
11. develop proposal for environmental sanitation;
12. carry out advocacy and sensitisation on environmental sanitation;
13. take part in institutional sanitation;
14. what are the constitutional responsibilities on environmental sanitation (3rd schedule) ;
15. discuss the features, characteristics and operations of eco-san; and
16. enumerate diseases related to environmental sanitation.



Course Contents

Definition, concepts, terminologies in environmental sanitation: environment, environmental sanitation. components of environmental sanitation: solid waste management, excreta and sewage disposal, food sanitation, market and abattoir sanitation, sanitary inspection of premises (SIP), housing and urban development, management of the urban drainage system, school sanitation, pest and vector control, adequate potable water supply, control of reared and stray animals, weed and vegetation control, hygiene education and promotion, hospital sanitation, medical waste sanitation. Methods of disposal of dead bodies, embalment of dead bodies, autopsy report, disposal of dead bodies in emergency conditions, exhumation, transportation of corpse, mortuary and cemetery. Planning for sanitation. Special homes sanitation, recreational centres and garden sanitation, Institutional sanitation such as hospital, government offices, government houses, stadia, and many others. SIP Tools (E.S. 1-15); Role of Environmental Health practitioners in environmental sanitation, institutional sanitation and many others. organisation of sanitation activities. Techniques involved in promoting community sanitation. Community mobilisation and participation in environmental sanitation. Management of urban drainage system. Financing environmental sanitation. Sanitation advocacy: Talking sanitation using various media. Tools, equipment and instruments for environmental sanitation. Development of proposal for sanitation; Strategies for Sustaining environmental sanitation. Indices of environmental sanitation among populace. Reporting system for sanitation; national policy on environmental sanitation; Environmental sanitation laws; features of eco-toilets, types of eco-toilets; recycling the nutrient. Grey water characteristics and management, advantages and disadvantages of ecological sanitation; Environmental Sanitation Diseases such as Ascariasis, Cholera and many others.

400 Level

EHS 401: Environmental Toxicology

(2 Units C: LH 30)

Learning Outcomes

At the end of this course, students should be able to:

1. explain the following terms toxicology, environmental toxicology, chemical pathology, toxicodynamic, toxicokinetics, pesticides, phytotoxins, LD₅₀, AD, LC₅₀, dose response and many others;
2. outline the different types of toxicology;
3. discuss the classification of toxicology;
4. explain the importance of toxicology in environmental health care;
5. outline the principles of chemical pathology;
6. examine common Environmental Toxicants/poisons;
7. discuss exposure pathways such as skin, mouth, nose and many others;
8. compare LD₅₀ and LC₅₀ ;
9. discuss the basic pathophysiology of toxicant on cells, organs and systems;
10. outline the principles of probit analysis;
11. assess methods in the prevention and control of environmental poisons;
12. list common food additives and their public health importance;
13. appraise toxicants of environmental and public health concern;
14. distinguish medical and environmental toxicants;
15. list drugs and substances that are commonly abused;
16. elaborate toxicants inherent in mining activities in Nigeria;



17. outline the general approach in poison prevention and control;
18. explain signs, symptoms and management of poisoning;
19. analyse biological poisons from snake, scorpion and dog;
20. explain the use of anti-venoms in the management of biological poisoning;
21. discuss nanotoxicology;
22. what is forensics in environmental toxicology;
23. enumerate various types of Xenobiotics in the environment; and
24. discuss Antimicrobial Resistance (AMR) in the environment.

Course Contents

Introduction to toxicology and environmental toxicology: - classification and types of toxicology. Concept of LD and LC. Dose response analysis. Importance of toxicology in public health, introduction to chemical pathology. Toxicodynamics and toxicokinetics. toxicants of environmental and public health concern:- lead poisoning, Pesticides, hydrocarbon poisoning, cyanide, house hold toxicants, medical toxicants:- aspirin, barbiturate, acetaminophen, environmental toxicants and xenobiotics:- carbonmonoxide poisoning, food borne poisons, nitrogen oxide poison, sulphur oxide poison, drugs of abuse:- alcohol, nicotine toxicity, opiod; mining toxicants such as lead, mercury, uranium, arsenic, and many others. other toxicants:- heavy metals, radioactive materials, food additives, animal toxins, phytotoxins, plastics and psychogenic drugs. Toxic pollutants in air, land and water. Exposure pathways, standards and health implications. System, Organ, Tissue and Cell pathophysiology. Probit analysis; general approach in poison prevention and control; poisoning signs, symptoms and management; biological poisons:- snake, scorpion and many others venom. Basics of nanotoxicology; basics of forensics in EH; Antimicrobial Resistance (AMR) in the environment.

EHS 403: Environmental Health Laboratory Techniques (2 Units C: LH 15; PH 45)

Learning Outcomes

At the end of this course, students should be able to:

1. explain the terms Laboratory, Environmental Health Laboratory, Instrumentation, SOPs, safety, sample, sample collection, media, environmental media, reagents and many others;
2. discuss the principles, purpose and aims of EHLs;
3. outline the importance and functions of Environmental Health laboratory;
4. discuss the construction and organisation of EHLs;
5. distinguish between general purpose laboratory and specific EHLs;
6. list the safety precautions in handling of laboratory equipment;
7. discuss the SOPs in field and laboratory testing;
8. outline the principle and procedures in the preparation of standard solutions and reagents in EHLs;
9. outline the importance of documentation and storage of laboratory equipment and reagents;
10. what is laboratory assessment and chemical hygiene? ;
11. outline the steps in sample collection, preservation, transportation and analysis for water, air, food, soil, objects, fomites and body fluids;
12. discuss the application of EHLs in forensics and crime investigation;
13. outline steps in sample collection from crime scene;
14. compare quality assurance and quality control in EHLs;
15. what is a laboratory log book? ;
16. why is record keeping and reporting important in EHLs;



17. inspect water treatment plant, waste water treatment plant, solid waste management facilities, public health laboratories, markets, selected industries, and many others;
18. discuss the need for professional accreditations of EHLs by EHORECON;
19. outline the roles of EHL in disease control and prevention;
20. discuss accident and emergency management from chemical spills, swallow, fire, falls, exhaustion in EHL; and
21. explain the content and use of Laboratory safety manual.

Course Contents

Introduction to Environmental Health laboratory. Importance and functions of Environmental Health laboratory (EHL). Construction and organisation of EHL. General laboratory, specific EHLs, environmental health biology, Environmental Health chemistry, environmental health physics, arbovirus laboratory. Safety precautions in the laboratory – safety manuals. Instrumentation: Microscopes, autoclaves, incubators, sterilizers, fridge/ freezers, hot air oven, lasers, gas chromatography, High-powered liquid chromatography, Atomic Absorption spectrophotometer (AAS) UV-visible spectrophotometer and many others, colorimeter, audiometer, dosimeter, cryostat, Polymerase Chain Reaction and many others. Standard Operating Procedures (SOPs) in field and laboratory practice. Preparation of standard solutions and reagents. Documentation and storage of laboratory equipment and reagents. Laboratory assessment and chemical hygiene. Sample collection, preservation, transportation and analysis for water, air, food, soil, objects, fomites and body fluids and body fluids. Application of EHLs in forensics. Sample collection and analysis from crime scene. Quality assurance and quality control. Concept of laboratory log book, record keeping and reporting. Field trip to various environmental facilities such as water treatment plant, waste water treatment plant, solid waste management facilities, public health laboratories, markets, selected industries, and many others. professional accreditations of EHL. Role of EHLs in disease control. Accident and emergency management: -chemical spills, swallow, fire, falls, exhaustion and many others.

EHS 419: Pest and Vector Management

(2 Units C: LH 15; PH 45)

Learning Outcomes

At the end of this course, students should be able to:

1. explain the terms pest, pesticide, pest control, pest management, IPM, IRS, IRM and many others;
2. describe the characteristics of pests of public health Importance;
3. classify vectors;
4. discuss public health implications of rodents and their control;
5. explain the roles of pests in disease causation;
6. distinguish pests and vectors;
7. identify common public health pests;
8. evaluate pest infestation status in a given area;
9. classify pesticides into insecticides, nematocides, acaricides, fungicides, bactericide;
10. identify major insecticides used in pest management such as Organochlorides, organophosphates, carbamates, pyrethroids and many others;
11. describe pesticide formulation and use in environmental public health;
12. explain the principles of pesticide application and use;
13. identify pest and vector control equipment;
14. discuss pest management strategies;



15. compare the mechanism of actions of different insecticides;
16. classify public health pest;
17. evaluate pest and vector status in a given environment;
18. discuss vector-borne diseases;
19. explain insecticide Resistance and resistance Management (IRM) ;
20. describe pesticides formulation;
21. classify methods in pest management and control: such as chemical, biological, physical, environmental hygiene;
22. outline equipment for pest management;
23. compare indoor residual spraying (IRS) and outdoor spray;
24. distinguish fumigation, disinfection, disinfestation, decontamination, deodorization and spraying;
25. discuss vector-borne diseases; and
26. design and execute vector control programme.

Course Contents

Introduction to pest/vector and pest & vector management. Pest ecology – systematic and phylogeny. Arthropodes of Public Health Importance: Insects – Culicidae (mosquito), Simuliidae (Black fly), Phlebotomidae (Sand fly), Glossinidae (Tsetse fly), Muscidae (House fly), Splanterio (Fleas), Anoplura (Lice), nemiptera (Bug). Other classes of public health Importance: Diplopoda, Chilopoda, Arachnida. Rodents:-types, characteristics, habitats, life cycle, control and diseases associated with rodents. Assessment of pest status, Vector – definition, type, classification. Vector-borne diseases. Vector control programme. Diseases of Pests. Integrated Pest Management (IPM). Insecticide Resistance Management (IRM). Types of pesticides-organo-chlorines, organo-phosphates, carbamate and pyrethroids, pesticides formulation and use, methods in pest management and control: such as chemical, biological, physical, environmental hygiene, Equipment for Pest Management: Sprayers, rat trap. Indoor residual spraying (IRS). Outdoor spray. Principles of fumigation, disinfection, disinfestation, decontamination, deodorisation and spraying and many others.

EHS 402: Industrial Attachment (SIWES)/Field Practicum (6 Units C: PH 270)

Intensive professional practice exposure to Environmental Health Practice sites as specified in Annexure 7

Learning Outcomes

At the end of this course, students should be able to:

1. participate in the organisation of environmental health services;
2. identify environmental health services delivery points (SDPs) ;
3. explain the day-to-day functions of various SDPs; and
4. Prepare and present field reports.



500 Level

EHS 501: Seminar

(1 Unit C: LH 15)

Learning Outcomes

At the end of this course, students should be able to:

1. apply skills in seminar writing and presentation;
2. comprehend the style and structure of academic writing;
3. prepare and present the seminar; and
4. submit reviewed article for publication in academic and professional journal.

Course Contents

Students will be required to study and to review literatures on a topic in Environmental Health and thereafter, make a presentation at the Faculty/Department. Scores will be allotted based on student performance during the presentation.

EHS 503: Water, Sanitation and Hygiene

(2 Units C: LH 15; PH 45)

Learning Outcomes

At the end of this course, students should be able to:

1. explain the following terms; water, sanitation, hygiene ECO-SAN, CLTS, CLUES, PHAST, GLAAS, SDGs and many others;
2. explain the concepts of WASH;
3. discuss WASH in Schools, Healthcare Facilities (HCFs), public places and emergency situations;
4. identify and discuss the impact of WASH related diseases;
5. discuss the importance of WASH programmes in epidemic situations such as Covid-19, Ebola and many others;
6. appraise gender issues in WASH;
7. outline the importance of WASH to the public;
8. discuss the roles of Govt and NGOs in WASH programs in Nigeria;
9. discuss WASH policies in Nigeria;
10. evaluate sanitary methods in excreta management;
11. outline WASH related SDGs;
12. discuss sanitation marketing in WASH; and
13. how to set up toilet business.

Course Contents

Water Sanitation and Hygiene (WASH), evolution of WASH, Terminologies. Concepts of water, sanitation and hygiene. Water sanitation and hygiene in schools. WASH in health care facilities, WASH in public place such as markets, mosques, churches, parks, recreational facilities and filing stations. WASH in Emergency situations like Global Analysis and Assessment of Sanitation and Drinking-Water IDPs camps, WASH in low-income countries, WASH related diseases, Impact of WASH on diseases, WASH in pandemic situations such as Covid-19, Gender issues in WASH, Genital hygiene, Menstrual Hygiene Management, Emergency water and emergency sanitation, Importance of WASH to the public, especially children. Excreta management technologies-ECO-SAN. Air, Water & Soil quality; sanitation approaches - Community Led Total Sanitation (CLTS), Community Led Urban Environmental Sanitation (CLUES), Participatory Hygiene and Sanitation



Technologies (PHAST). and many others; WASH policies, Roles of Development Partners and Non Governmental Organisations (NGOs) in WASH programmes in Nigeria, such as United Nations Children Emergency Fund (UNICEF), UN-Water, WATER AID. Water safety plan, Sanitation marketing, sanitation ladder, Water Supply and Sanitation Collaborative Council (WSSCC)/Hygiene & Sanitation Fund (HSF), Global Sanitation Fund (GSF), Global Analysis and Assessment of Sanitation and Drinking (GLAAS). Sustainable Development Goals (SDGs). WASH Toilet Business set-up.

EHS 505: Environmental Epidemiology

(2 Units C: LH 30)

Learning Outcomes

At the end of this course, students should be able to:

1. explain the following terms: epidemiology, environmental epidemiology, descriptive epidemiology, analytical epidemiology, risk factor, cohort, surveillance and many others;
2. discuss domain in environmental epidemiology;
3. describe exposure assessment in environmental epidemiology;
4. discuss descriptive analysis and its application;
5. discuss methods of environmental epidemiological investigations such as time trend analysis;
6. explain risk assessment and risk management;
7. discuss the process of investigating pollution occurrences in the environment;
8. identify environmental hazards;
9. apply the use of computer applications in epidemiological investigations;
10. explain the differences between environmental contamination and environmental pollution;
11. discuss Environmental remediation, exposure quantification and dose response analysis;
12. describe the principles of healthy worker effect; and
13. enumerate measures of association, causality & attribution.

Course Contents

Definitions, concepts. General introduction to Epidemiology, Environmental epidemiology and domain of environmental epidemiology. Exposure Assessment. Descriptive Analysis, methods of investigation including the use of Time –Trend and Spatial pattern analysis. Poisson Regression. Surveillance, Risk Assessment and management. Pollution of air, water and soil, ionizing and non-ionizing radiation. Investigation of disease clusters, potential environmental hazards to health. Rudiments of environmental epidemiology, use of statistical packages (SPSS, EPI – INFO, Epidata) and vital statistic and many others. Environmental contamination, environmental remediation, exposure quantification, dose response analysis, healthy worker effect principles, measures of association, causality & attribution.



Learning Outcomes

At the end of this course, students should be able to:

1. explain the following terms: air quality, Management, Pollution, ozone, pollutant and many others;
2. explain the objectives, theories and historical overview of air quality management;
3. discuss the composition of ambient air;
4. classify air pollution according to sources, types, causes and effects;
5. explain industrial and municipal air pollution;
6. discuss environmental health problems arising from air pollution;
7. explain indoor air pollution and abatement;
8. discuss the health and environmental effects of indoor air pollutants;
9. carryout air quality monitoring;
10. outline basic equipment and tools used in air quality monitoring;
11. appraise the principles and objectives of air quality management;
12. describe the health and environmental effects of ozone layer depletion, tobacco smoke, asbestos and carbon monoxide;
13. explain sick building syndrome;
14. discuss the principles, objectives and application of risk assessment and management;
15. distinguish hazard analysis, identification and characterization;
16. compare different types of air pollutants;
17. describe the institutional roles and duties in Nigeria;
18. outline the strategies in the prevention and control of indoor and outdoor air quality;
19. explain photochemical smog;
20. outline the process of corrosion of artefacts & abrasion of surfaces due to poor air quality; and
21. discuss air quality models.

Course Contents

Concept, theories, objectives and historical overview of air quality. Composition of air. Air pollution, sources, types, causes and effects. Industrial and municipal air pollution, environmental problems arising from air pollution-global warming, ozone layer depletion, acid rain, photochemical smog, corrosion of artefacts, abrasion of surfaces & other bodies, inhibition of photosynthesis and many others. indoor air pollution like environmental tobacco smoke, biomass fuel, asbestos, carbon monoxide, sick building syndrome (SBS) and many others; health and environmental effects of air pollution. Equipment and tools in air quality assessment.

Introduction to air quality models. Risk assessment such as health risk assessment and risk management, hazard and identification in the field and human exposure assessment, health risk characterization, health impact assessment and epidemiological methods. Air quality sampling, monitoring and analysis. Air quality standards and guidelines (national and international) air pollution prevention and control Meteorology. Institutional roles in air quality management.



Learning Outcomes

At the end of this course, students should be able to:

1. define the following terms: research, research methodology, sample, questionnaire, literature and many others;
2. describe the role of Research in Environmental Health Practice;
3. develop a good proposal on appropriate environmental health topic;
4. design and conduct scientific research in any given Environmental Health specialized areas;
5. outline the procedure and pattern in reviewing Literature;
6. discuss the methods of collecting, collating, analysing and presenting data;
7. apply the use of computer programmes in analysing and presenting data;
8. outline the steps in interpretation and presentation of research findings;
9. what is Research Methodology? ;
10. outline the procedure in proposal writing;
11. examine research strategies and design;
12. discuss descriptive epidemiological studies and clinical trials;
13. what is experimental study? ;
14. determine steps in sample size estimation;
15. discuss sampling methods;
16. compare bias and confounding factors;
17. determine basic risk measurement;
18. what is test of significance? ;
19. distinguish between association and causation in health research;
20. explain ethical aspect of health research;
21. what is a research proposal? ;
22. illustrate how to design a questionnaire;
23. compare validity and reliability of a research instrument;
24. distinguish between qualitative and Quantitative Data;
25. discuss types of data use in health research;
26. carry out data analysis using descriptive & inferential statistical parameters;
27. analyse data using computer based analytical packages such as SPSS, EPI-INFO, chi-square and many others;
28. choose a research topic;
29. construct general and specific objectives;
30. discuss the organisation of a research project;
31. compare APA and Vancouver Referencing;
32. discuss the importance of timeline; and
33. explain the principles and types of budgeting in EH research.

Course Contents

Introduction to Research Methodology and proposal writing. Research strategies and design. Descriptive epidemiological studies and clinical trials. Experimental studies. Sampling methods and sampling size, bias and confounding. Basic risk measurement. Test of significance, association and causation. Ethical aspect of health research. Construction of research proposal. Questionnaire design, validity and reliability. Qualitative and Quantitative Data. Types of data. Data analysis using Descriptive statistics and Inferential statistics and many others. use of computer based analytical packages such as SPSS, EPI-INFO, chi-square and many others.



Research topic selection, objective, literature search, methodology, results and discussion. Referencing such as APA and Vancouver. Organisation of research project and communication of research findings, timeline, budgeting.

EHS 502: Research Project

(4 Units C: PH 180)

Learning Outcomes

At the end of this course, students should be able to:

1. conduct scientific research work to contribute to body of knowledge in the selected area; and
2. render succinct technical report of the work.

Course Contents

Students shall, with the guidance of their Supervisors select an area they wish to conduct their scientific research on. The results of the research work shall be collated and reported in conformity with the standard guidelines of the awarding Institution.

EHS 506: Solid Waste Management

(2 Units C: LH 15; PH 45)

Learning Outcomes

At the end of this course, students should be able to:

1. explain the terms solid waste, solid waste management and waste to wealth concept;
2. classify solid waste eg, medical/ healthcare, electronic, agriculture, construction and many others;
3. explain the nature of solid waste;
4. describe waste management hierarchy;
5. describe sanitary methods of waste collection, segregation, transportation and disposal;
6. take part in waste management activities in the community;
7. identify health problems associated with poor solid waste management;
8. carry out waste minimisation and recycling;
9. explain the hierarchical structure in solid waste management;
10. examine the technical points that are required to set up a solid waste management system;
11. identify environmental laws, regulations and policies and apply them to solid waste management;
12. evaluate the economic importance of solid waste;
13. plan a municipal solid waste management system;
14. carry out biological, chemical and physical analyses of municipal solid wastes;
15. explain various methods of SWM disposal;
16. prepare a solid waste management plan;
17. distinguish biodegradable and non-biodegradable solid wastes;
18. differentiate combustible and non-combustible wastes;
19. explain wastes inventorisation;
20. discuss wastes life cycle analysis;
21. explain polluter pay principle;
22. evaluate extended polluter responsibility;
23. describe the process of willingness to pay for service survey;
24. examine waste evacuation services and service provision;
25. describe the outlay and functionalities of a transfer station;
26. outline the Institutional arrangement in SWM;



27. explain the operations of a sanitary landfill;
28. enumerate Laws, Policies & Regulations in SWM;
29. explain the process of Faecal Sludge Management;
30. elaborate on Waste to Energy (WtE) and Waste to Wealth (WtW) ;
31. discuss how to set up and operate an SWM Business in Nigeria;
32. explain the following concepts: waste, medical waste, Biomedical waste and other special waste and many others;
33. classify Biomedical waste according to the sources of generation;
34. discuss the Health impact of Biomedical waste;
35. explain the processes of planning, handling, transportation and disposal of biomedical waste;
36. discuss importance of biomedical waste; sorting, segregation and treatment;
37. identify various waste bins used in biomedical waste management;
38. discuss concepts of waste minimization;
39. evaluate National policies on healthcare waste;
40. outline the Health, Safety rules and universal precautions in handling biomedical waste; and
41. describe infection, prevention and control (IPC) measures associated with biomedical waste.

Course Contents

Basic concepts, nature and classification of solid wastes. Theory of solid waste collection, handling and disposal. Field sampling and laboratory analysis; characterisation of different types of solid wastes monitoring of solid wastes. Analysis of municipal, industrial, hazardous solid wastes. Waste management technologies. Waste management hierarchy-minimisation, recycling, waste to wealth concept and many others. Solid waste and human health and many others. Solid Waste Management methods – composting, incineration and many others; waste management plan. Biodegradable and non-biodegradable solid wastes. Combustible and non-combustible wastes. Wastes inventorisation. Wastes life cycle analysis. Polluter pay principle. Extended polluter responsibility. Willingness to pay for service survey. Waste evacuation services and service provision. Transfer station. Institutional arrangement. Management of sanitary landfills. Laws and Policies in SWM. Faecal Sludge Management. Waste to Energy (WtE). Waste to Wealth (WtW). SWM Business management. Concept, classification, sources and health impacts, planning, handling and transportation of biomedical and special waste. Waste minimisation, recycling and reuse. The role of legislation in biomedical and special waste, treatment technologies, disposal methods, health and safety rules for personnel and associated workers. Infection control and emergencies response. Training and retraining modality for handling of biomedical and special waste.

EHS 514: Sewage and Waste Water Management

(2 Units C: LH 15; PH 45)

Learning Outcomes

At the end of this course, students should be able to:

1. explain the terms sewage, waste water, waste water management;
2. calculate waste water flow rates and run off;
3. monitor of sewerage system;
4. describe primary, secondary and tertiary treatment;
5. identify basic waste water treatment methods;
6. design a community sewage and waste water treatment plant;
7. discuss sanitary aspect of sewage and waste water treatment at the municipal level; and
8. explore Business opportunities in sewage management.



Course Contents

Waste water Systems. Population studies. Waste water flow rates. Runoff. Groundwater Infiltration. Materials for sewers. Hydraulics of sewers. Design of Sewers/drains Combined sewers and Storm water sewers, appurtenances and special structures. Pumps and pumping stations. Design of wastewater treatment plant, Primary treatment processes: – screening, grit removal, flow measurement (weirs and flumes). Design facilities for primary treatment – radial and rectangular sedimentation tanks, Design facilities for secondary/ biological treatment of wastewater, Activated sludge process, Trickling Filters, Stabilisation and Oxidation ponds, Anaerobic lagoons. Treatment and disposal of sludge. Sources of sludge, Quantities and characteristics. Sludge dewatering methods. Uses of sludge. Sources of water supply, and their exploitation: Advanced waste water treatment methods. Types and sources of waste water. Characteristics and flow rates impacts of waste water treatment, objectives and disposal. regulation, principles of applied microbiology, wastewater treatment (introduction, primary (screens and comminutors, grit removal, flow equalisation, sedimentation and flotation), secondary (Tricking filters, rotating biological discs: activated sludge, oxidation pond) physic-chemical treatment, advanced treatment,(Ultra filtration, reverse osmosis, activated carbon filter, UV sterilisation, and many others) treatment of sludge, disinfection), land disposal , sewer corrosion, design of waste water treatment units. Business opportunities in sewage management.



Minimum Academic Standards

Equipment

1a) EHL I: General Laboratory

| S/No | Equipment & Materials | Quantity |
|------|--|----------|
| 1 | Pipette Rack (<i>Plastic</i>) | 5pcs |
| 2 | Pipette Rack (<i>Wooden</i>) | 5pcs |
| 3 | Glass Pipettes (<i>1ml vol.</i>) | 10pcs |
| 4 | Glass Pipettes (<i>2ml vol.</i>) | 10pcs |
| 5 | Glass Pipettes (<i>5ml vol.</i>) | 10pcs |
| 6 | Glass Pipettes (<i>10ml vol.</i>) | 10pcs |
| 7 | Automatic Micro-Pipette (<i>0 to 100μl</i>) | 3pcs |
| 8 | Automatic Micro-Pipette (<i>100 to 1000 μl</i>) | 3pcs |
| 9 | Test tube Racks (<i>stainless for 10ml tubes</i>) | 100pcs |
| 10 | Test tube Racks (<i>stainless for 20ml tubes</i>) | 100pcs |
| 11 | Test tubes (<i>10ml</i>) | 100pcs |
| 12 | Test tubes (<i>20ml</i>) | 100pcs |
| 13 | Beakers (<i>50ml vol.</i>) | 10pcs |
| 14 | Beakers (<i>100ml vol.</i>) | 10pcs |
| 15 | Beakers (<i>250ml vol.</i>) | 10pcs |
| 16 | Beakers (<i>500ml vol.</i>) | 10pcs |
| 17 | Beakers (<i>1000ml vol.</i>) | 10pcs |
| 18 | Conical flasks (<i>50ml vol.</i>) | 10pcs |
| 19 | Conical flasks (<i>100ml vol.</i>) | 10pcs |
| 20 | Conical flasks (<i>250ml vol.</i>) | 10pcs |
| 21 | Conical flasks (<i>500ml vol.</i>) | 10pcs |
| 22 | Conical flasks (<i>1000ml vol.</i>) | 10pcs |
| 23 | Cylinders (<i>50ml vol.</i>) | 10pcs |
| 24 | Cylinders (<i>100ml vol.</i>) | 10pcs |
| 25 | Cylinders (<i>250ml vol.</i>) | 10pcs |
| 26 | Cylinders (<i>500ml vol.</i>) | 10pcs |
| 27 | Cylinders (<i>1000ml vol.</i>) | 10pcs |
| 28 | Flat bottom flasks (<i>50ml vol.</i>) | 10pcs |
| 29 | Flat bottom flasks (<i>100ml vol.</i>) | 10pcs |
| 30 | Flat bottom flasks (<i>250ml vol.</i>) | 10pcs |
| 31 | Flat bottom flasks (<i>500ml vol.</i>) | 10pcs |
| 32 | Flat bottom flasks (<i>1000ml vol.</i>) | 10pcs |
| 33 | Centrifuges tubes | 100pcs |
| 34 | Pasteur pipette (<i>glass</i>) | 100pcs |
| 35 | Pasteur pipette (<i>plastic</i>) | 100pcs |
| 36 | Urinometer | 10pcs |
| 37 | Thermometer | 10pcs |
| 38 | Reagent and Dispensing bottles (<i>100ml vol.</i>) | 10pcs |
| 39 | Reagent and Dispensing bottles (<i>250ml vol.</i>) | 10pcs |
| 40 | Reagent and Dispensing bottles (<i>500ml vol.</i>) | 10pcs |
| 41 | Reagent and Dispensing bottles (<i>1000ml vol.</i>) | 10pcs |



| | | |
|----|--|-------|
| 42 | pH meter | 4pcs |
| 43 | Centrifuge (<i>12 buckets model</i>) | 3pcs |
| 44 | Refrigerator (<i>2 doors</i>) | 1 pc |
| 45 | Deep freezer (<i>medium</i>) | 1 pc |
| 46 | Hot Air Oven | 1pc |
| 47 | Spectrophotometer | 1pc |
| 48 | Colorimeter | 1 pc |
| 49 | Water distiller | 1pc |
| 50 | Incubator | 1pc |
| 51 | Chemistry Semi Auto-Analyser | 1pc |
| 52 | Hot plate heater | 2pcs |
| 53 | Wooden or stainless test tube clamps | 25pcs |
| 54 | Wooden or stainless test tube clamps | 25pcs |
| 55 | Water bath | 3pcs |
| 56 | Fume chamber | 1pc |
| 57 | Electrophoretic Tanks (<i>Shandon model</i>) | 2pcs |
| 58 | Electronic weighing balance (Top load) | 2pcs |
| 59 | Hematological Analyser | 1pc |
| 60 | Thermostat oven | 1pc |
| 61 | Fume cupboard | 2pcs |
| 62 | Magnetic hot plate | 1pc |
| 63 | Temperature control oven | 1pc |
| 64 | Heating mantle | 1pc |
| 65 | Hot plate | 1pc |
| 66 | Binocular Microscope | 20pcs |
| 67 | Camera Microscope | 1pc |
| 68 | Teaching Microscope | 2pc |
| 69 | Reverse Transcription-Polymerase Chain Reaction (RT-PCR) Machine | 1pc |
| 70 | UV Spectrophotometer | 1pc |
| 71 | VIS Spectrophotometer | 1pc |
| 72 | Colorimeter (Hand held) | 1pc |
| 73 | Autoclave | 1pc |
| 74 | Dessicators | 1pc |
| 75 | Rotators | 1pc |
| 76 | De-ionizer | 1pc |
| 77 | Distiller machine | 1pc |
| 78 | Hood fume cabinet | 1pc |
| 79 | Laminar flow hoods | 1pc |
| 80 | Atomic Absorption Spectrophotometer (AAS) | 1pc |
| 81 | Light meters and Luminance meters | 5pcs |
| 82 | Anemometers | 5pcs |
| 84 | Manometers | 4pcs |
| 85 | Flow meters | 5pcs |
| 86 | Burnsen burner | 10pcs |

1b) EHL II: Food and Water Laboratory



| S/No | Equipment & Materials | Quantity |
|-------------|----------------------------------|--------------------------|
| 1 | Binocular Microscope | 20pcs |
| 2 | Fluorescence Microscope | 1pc |
| 3 | Digital Microscope | 2pcs |
| 4 | Magnifying Lens | 10pcs |
| 5 | Centrifuge | 2pcs |
| 6 | UV Spectrophotometer | 1pc |
| 7 | Industrial centrifuge | 1pc |
| 8 | Incubator | 5pcs |
| 9 | Anaerobic Culture Jars | 5pcs |
| 10 | Mettler Balance | 2pcs |
| 11 | Autoclaves | 2pcs |
| 12 | Water Bath | 2pcs |
| 13 | Hot air Oven | 2pcs |
| 14 | Bunsen burner | 15pcs |
| 15 | Refrigerators | 1pc |
| 16 | Freezers | 1pc |
| 17 | Chemical Balance | 2pcs |
| 18 | Glass wares | Assorted & various sizes |
| 19 | Food probes Thermometer | Assorted & various sizes |
| 20 | Millipore membrane apparatus | 3pcs |
| 21 | pH meter | 5pcs |
| 22 | Turbidity meter | 3pcs |
| 23 | Conductivity meter | 3pcs |
| 24 | Water testing kits | Assorted |
| 25 | Refractometer | 5pcs |

1c) EHL III: Air Quality, Noise and Radiation Laboratory

| S/No | Equipment & Materials | Quantity |
|-------------|--|-----------------|
| 1 | Sound level Meter | 5pcs |
| 2 | Air Quality Monitors (Crowcon Gasman CO ₂ Monitor) | 5pcs |
| 3 | Dust detector | 6pcs |
| 4 | Air Samplers - Gas metres (CO; CO ₂ ; SO ₂ ; NO ₂ ; O ₃ ; NH ₃ and many others. Particulate Matter Samplers (TSP; PM ₁₀ ; PM _{2.5} ; PM _{0.1} ; Nano particles | 5pcs |
| 5 | Ozone monitor | 5pcs |
| | Portable met station | - |
| 6 | Radiation monitors | 3pcs |
| 7 | Flame Ionization detector (FID) | 3pcs |
| 8 | Global Position Systems (GPS) | 3pcs |
| 9 | Gas chromatography | 1pc |
| | High powered Liquid Chromatography | 1 |
| | Atomic Absorption Spectrophotometre | 1 |
| | Inductively-coupled plasma Spectrophotometre | 1 |



| | | |
|----|--|------|
| 10 | Toxic gas meters | 1pc |
| 11 | Combustible Gas and Oxygen meters | 1pc |
| 12 | Infrared Analyzers | 1pc |
| 13 | Isocyanate monitors | 2pcs |
| 14 | Heat stress monitor | 3pcs |
| 15 | Volatile Organic Compounds Monitors (VOCs) | 3pcs |
| 16 | Carboxy-hemoglobin sampler | 3pcs |
| 17 | Spirometer | 5pcs |
| 18 | Audiometer | 5pcs |

1d) EHL 1V: Public Health Entomology and Arbovirus Laboratory

| S/No | Equipment & Materials | Quantity |
|------|---|----------|
| 1 | Teaching Microscope | 3pcs |
| 2 | Dissecting kit | 5pcs |
| 3 | Dissecting blade | 5pcs |
| 4 | Dissecting needle | 10pcs |
| 5 | Camera Microscope | 2pcs |
| 6 | Refrigerator | 1pc |
| 7 | Freezer | 1pc |
| 8 | PCR Machine | 1pc |
| 9 | Autoclave | 2pcs |
| 10 | Shaker water bath | 1pc |
| 11 | pH meter | 1pc |
| 12 | Fluorescent Microscope with camera | 1pc |
| 13 | Inverted light Microscope | 1pc |
| 14 | Micropipettes | 10pcs |
| 15 | Multi-channel pipettes | 10pcs |
| 16 | Electronic balance for weighing chemicals | 2pc |
| 17 | Glasswares | Assorted |
| 18 | Water distiller | 1pc |
| 19 | Hot Air oven | 1pc |
| 20 | Reagents and Supplies | Assorted |
| 21 | Ultra Centrifuge | 1pc |
| 22 | Elisa Reader | 1pc |
| 23 | Gel electrophoresis Apparatus | 1pc |
| 24 | Magnetic Stirrer | 1pc |
| 24 | Vortex Mixer | 1pc |



1e) EHL V: Environmental Epidemiology and Toxicology Laboratory

| S/No | Equipment & Materials | Quantity |
|-------------|--|-----------------|
| 1 | Spectrophotometer | 1 |
| 2 | Waterproof Plywood | 3 |
| 3 | Innoculation Chamber Economy | 2 |
| 5 | Beehive, Breeding chamber | 1 |
| 6 | Nest For Chrysopa, | 2 |
| 7 | Breeding Nest for Flies | 2 |
| 8 | Brown Plant Hopper Insect Rearing Cage | 5 |
| 9 | Rat & Mosquito Cage | 5 |
| 10 | Box for Glass Specimen Tubes | 5 |
| 11 | Insect Setting Block | 5 |
| 12 | Entomological Pin Storage Block | 10 |
| 13 | Plankton Net | 5 |
| 14 | Dissecting Microscope | 3 |
| 15 | Teaching Microscope | 1 |
| 16 | Camera Microscope | 1 |
| 17 | Aspira | 2 |
| 18 | Beating net | 4 |
| 19 | Bottle trap for insects | 3 |
| 20 | Butterfly net | 3 |
| 21 | Electrical penetration graph | 2 |
| 22 | Malaise trap | 2 |
| 23 | Euparal | 3 |
| 24 | Entomological equipment for mounting and storage | 3 |
| 25 | Flight interception trap | 3 |
| 26 | Insect trap | 3 |
| 27 | Killing jar | 3 |
| 28 | Leaf litter sieve | 3 |
| 29 | Lill pin | 3 |
| 30 | Moth trap | 3 |
| 31 | Pheromone trap | 3 |
| 32 | Pitfall trap | 3 |
| 33 | Corcyra Cage | 3 |

Environmental Health Museum

| S/N | Description of items | Quantity in stock |
|------------|-----------------------------|--------------------------|
| 1. | Sweep net | 5pcs |
| 2. | Insect boxes | 5pcs |
| 3. | Specimen bottles | 5pcs |
| 4. | Magnifying glass | 5pcs |
| 5. | Trap nets | 5pcs |
| 6. | Lamps | 5pcs |
| 7. | Sticky traps | 5pcs |
| 8. | Sampling knives | 5pcs |



| | | |
|-----|--|----------|
| 9. | Specimen cage | 5pcs |
| 10. | Cage traps | 5pcs |
| 11. | Back-break traps | Assorted |
| 12. | Wooden/metallic insect traps | 5pcs |
| 13. | Working table wall chart of insects | 5pcs |
| 14. | Molluscs, aves, rodents, and many others | Assorted |
| 15. | Insect displaying boards | Assorted |
| 16. | Scalpels | Assorted |
| 17. | Kidney dish | 5pcs |
| 18. | Empty/expired vaccine vials | Assorted |
| 19. | Steam sterilizer | Assorted |
| 20. | Vaccines | Assorted |
| 21. | Vaccine carrier | Assorted |
| 22. | Needles and syringes | Assorted |
| 23. | Immunization charts | Assorted |
| 24. | Hand gloves of different sizes | Assorted |
| 25. | Flip chart | Assorted |
| 26. | Phanto | 1pc |
| 27. | Candle filter | Assorted |
| 28. | Doll | Assorted |
| 29. | Sphygmomanometer | Assorted |
| 30. | Pneumatic sprayer | 2pcs |
| 31. | Motorized sprayer | 1pc |
| 32. | Electrodyn sprayer | 1pc |
| 33. | Handy sprayer (flit gun) | 5pcs |
| 34. | Knapsack sprayers (CP30) | 2pcs |
| 35. | Knapsack sprayer (CP15) | 2pcs |
| 36. | Stethoscope | Assorted |
| 37. | Anatomical charts/model | Assorted |
| 38. | Skeleton model | 2pcs |
| 39. | Filtration pot | 2pcs |
| 40. | Insecticide pan | 5pcs |
| 41. | Parasitology specimen | Assorted |
| 42. | Food samples (grains/legumes/leaves) | Assorted |
| 43. | Overhead projector | 1pc |
| 44. | Canned foods | Assorted |
| 45. | ORT kit | Assorted |
| 46. | Weighing scale | 2pcs |
| 47. | Forceps | 2pcs |
| 48. | Scissors | 2pcs |
| 49. | Fogging machine | 2pcs |
| 50. | Fire extinguisher | Assorted |



| | | |
|------|---|----------|
| 51. | Chamber land filter | 3pcs |
| 52. | Measuring ruler | Assorted |
| 53. | Posters | Assorted |
| 54. | Human skull model | Assorted |
| 55. | Pelvic girdle model | Assorted |
| 56. | Skull model | Assorted |
| 57. | Heart model | Assorted |
| 58. | Eye model | Assorted |
| 59. | Kidney model | Assorted |
| 60. | Ear model | Assorted |
| 61. | Baton electrical insect killer | Assorted |
| 62. | Electrical insect trap | Assorted |
| 63. | Pressurized sprayer | Assorted |
| 64. | Formalin Preserved Pests | Assorted |
| 65. | Safety wears – goggle, boots, coverall, and many others | Assorted |
| 66. | Face masks | Assorted |
| 67. | Monocular microscope | 1pc |
| 68. | Glass lens | Assorted |
| 69. | Pesticides – Organochlorines, Organophosphates, Carbamates, Pyrethoids, and many others | Assorted |
| 70. | Inoculation set | Assorted |
| 71. | Roof models/charts | 5pcs |
| 72. | Life cycle charts | Assorted |
| 73. | Samples of ABN | Assorted |
| 74.. | Environmental Sanitation Forms ES ₁ -ES ₁₅ | Assorted |
| 75. | Quadrants | Assorted |
| 76. | Bed nets | Assorted |
| 77. | Door and window screen | 5pcs |
| 78. | Photographs of pioneers of Environmental Health (National and International) | Assorted |
| 79. | Banned and Unbanned Insecticides | Assorted |
| 80. | Sanitary hard wares – water closet | 5pcs |
| 81. | Building plans | Assorted |
| 82. | Charts showing Rural huts and modern houses | Assorted |
| 83. | Torch light | Assorted |
| 84. | Search light | Assorted |



| | | |
|-----|-------------------------------|----------|
| 85. | Measuring tapes | Assorted |
| 86. | Buckets (metals and plastics) | Assorted |
| 87. | Funnels | Assorted |
| 88. | Insecticide Treated Nets | Assorted |
| 90. | Steam Sterilizer | 2pcs |
| 91. | Needles and syringes | Assorted |

Audio-Visual Studio

| | | |
|-----|---------------------------------|----------|
| 1. | Video player/VCD | 1pc |
| 2 | Slide projector | 1pc |
| 3. | Overhead projector | 1pc |
| 4 | Film projector | 1pc |
| 5 | Magnetic board | 1pc |
| 6 | Public address system | 1pc |
| 7. | Television set (minimum of 42") | 1pc |
| 8. | Cameras (video cameras) | 1pc |
| 9. | LCD (Power Point Projector) | 1pc |
| 10. | Audio tape recorder | 3pcs |
| 11. | Map | Assorted |

Practice/Demonstration Site

| | | |
|-----|--------------------------------------|-----|
| 1. | House-hold composter | 1pc |
| 2. | Model of chemical closet | 1pc |
| 3. | Model of incinerators | 1pc |
| 4. | Brick models for brick making | 1pc |
| 5. | Models of bonding | 1pc |
| 6. | Damp-proof courses | 1pc |
| 7. | Footings/Foundation | 1pc |
| 8. | Conventional Water Treatment System | 1pc |
| 9. | Conventional Sewage Treatment System | 1pc |
| 10. | Slaughter slab | 1pc |
| 11. | Composting pit (Wilson) | 1pc |
| 12. | Composting pit (Indoor process) | 1pc |
| 13. | Steamer (Formite disinfection) | 1pc |
| 14. | VIP Latrine (multiple compartment) | 1pc |



| | | |
|-----|-----------------------------------|-----|
| 15. | VIP Laterine (single compartment) | 1pc |
| 16 | Pit Latrine | 1pc |
| 17. | Water closet | 1pc |
| 18. | Biogas digester | 1pc |
| 19. | Types of housing | 1pc |
| 20. | Waste segregation chambers | 1pc |
| 21. | Bar incinerator | 1pc |
| 22. | Ventilation openings (Types) | 1pc |
| 23. | Septic tank | 1pc |
| 24. | Water collection centre | 1pc |

Technical Drawing Studio

| | | |
|-----|-----------------------------|----------|
| 1. | Table for drawing | 25pcs |
| 2. | Water colour | 10pcs |
| 3. | Drawing pencils | Assorted |
| 4. | Drawing pens | Assorted |
| 5. | Display cabinets and boards | 2pcs |
| 6. | Magnetic board | 2pcs |
| 7. | T-square | 25pcs |
| 8. | Ruler | 25pcs |
| 9. | Markers | Assorted |
| 10. | Drawing set | Assorted |
| 11. | French curve | 25pcs |
| 12. | Compass | 25pcs |
| 13. | Protractor | 25pcs |
| 14. | Set square | 25pcs |
| 15. | Pair of divider | 25pcs |
| 16. | Fastener | Assorted |



Staffing

Academic and Non Academic Staff

1. **Academic staff:** the core teaching staff should not be less than 60% of the total academic staff in the programme who should be licensed by EHORECON.
2. **Technical staff:** at least 40% of the technical staff involved in the training of students in the programme should be licensed by EHORECON.

Staff-Student Ratio

Determination of the number of academic staff required for an academic programme is contingent on the approved staff-student ratio for each discipline. The approved Staff-Student ratio in Basic Medical and Health Sciences is 1:15.

Staff – Mix by Rank

Academic staff in the Universities are broadly classified into three categories; Professorial (Professor/Reader), Senior lectureship and Lecturers Grade I and below. The Professorial cadre should constitute a maximum of 20 percent of the staff strength, Senior lecturers 35% while the remaining 45 percent is for lecturer I and below.

Classroom, Laboratories and Offices Space

Classroom

The standard requirement of 0.65m² per full-time student should be maintained. Thus the minimum total space requirement for a faculty or department shall be the product of its total full time equivalent student enrolment (FTE) and the minimum space requirement per full-time equivalent i.e. (FTE) 0.65m².

Office

In this respect, each academic staff should have an office space of at least 25 square metres taking into cognisance the status/cadre of the staff

In addition, there should be for the Faculty, a Dean's office and for each Department a Head of Department's office with attached offices for their supporting staff as specified below in m²:

| | | |
|----------------------------------|---|-------|
| Professor's office | - | 18.50 |
| Head of Department's office | - | 18.50 |
| Tutorial teaching staff's office | - | 13.50 |
| Other teaching staff space | - | 7.00 |
| Technical staff space | - | 7.00 |
| Secretarial space | - | 7.00 |
| Staff research laboratory | - | 16.50 |
| Seminar Space/per student | - | 1.85 |
| Laboratory space (per student) | - | 7.50 |



| S / N | LABORATORY/STUDIO | Dimension | Prep room | Lighting | Ventilation | Toilet/W H |
|-------|--|---------------|-----------|----------|---|------------|
| | General laboratory | 30 m x 15 m | 1 | 500 lux | 5-8 litres per second, per occupant and/or VO – 1/6 of floor area | 1 |
| | Food and water laboratory | 15 m x 10 m | 2 | 500 lux | 5-8 litres per second, per occupant and/or VO – 1/6 of floor area | 1 |
| | Air quality, noise and radiation laboratory | 15 m x 10 m | 1 | 500 lux | 5-8 litres per second, per occupant and/or VO – 1/6 of floor area | 1 |
| | Public health entomology & arbovirus laboratory | 15 m x 10 m | 2 | 500 lux | 5-8 litres per second, per occupant and/or vo – 1/6 of floor area | 1 |
| | Environmental epidemiology & toxicology laboratory | 15 m x 10 m | 1 | 400 lux | 5-8 litres per second, per occupant and/or vo – 1/6 of floor area | 1 |
| | Environmental health museum | 45 m x 20 m | 1 | 400 lux | 5-8 litres per second, per occupant and/or vo – 1/6 of floor area | 1 |
| | Audio-visual studio | 10 m x 5 m | - | 300 lux | 5-8 litres per second, per occupant and/or vo – 1/6 of floor area | 1 |
| | Technical drawing studio | 10 m x 5 m | - | 400 lux | 5-8 litres per second, per occupant and/or vo – 1/6 of floor area | 1 |
| | Practice/demonstration site(Open Field) | 200 m x 100 m | 1 | N/A | N/A | N/A |

Note: V.O. means Ventilation Opening

SIWES/Field Practicum Areas

Bachelor of Environmental health students are expected to undergo practical experiences in urban and rural areas, public and private establishments as follows:

| S/N | Practical areas | Duration | Remarks |
|-----|-------------------------|----------|---------|
| 1 | Epidemiological Units | 1 week | C |
| 2 | Health Education Units | 1 week | C |
| 3 | Water treatment plants | 1 week | C |
| 4 | Urban LGA | 3 weeks | C |
| 5 | Rural LGA | 2 weeks | C |
| 6 | Accredited EHSP outfits | 1 week | C |



| | | | |
|----|---|--------|---|
| 6 | EHORECON Headquarters/zonal offices | 1 week | C |
| 7 | Tertiary, secondary and primary health care facilities | 1 week | C |
| 8 | Tertiary and secondary educational institutions | 1 week | C |
| 9 | Private establishments (individual and corporate organisations) | 1 week | C |
| 10 | Custodial homes and rehabilitation centres) | 1 week | C |
| 11 | Sewage treatment facilities | 1 week | C |
| 12 | Hospitality, sport and recreational facilities | 1 week | C |
| 13 | Ministries, departments and agencies (MDA) | 1 week | C |
| 14 | Port health services (air, sea and land borders) | 1 week | C |
| 15 | Agricultural processing companies (including livestock) | 1 week | C |
| 16 | Estate facilities and management companies | 1 week | C |
| 17 | Rail and road transport facilities | 1 week | C |
| 18 | Energy and power plants | 1 week | C |
| 19 | Ministry of Works, housing and urban development (Town planning office) | 1 week | C |
| 20 | Weather and meteorological facilities | 1 week | C |
| 21 | Environmental Impact Assessment Consulting Firms | 1 week | C |
| 22 | Process Industries | 1 week | C |
| 23 | Food-vending establishments (Restaurants, Eateries and many others) | 1 week | C |

NOTE: areas need to be congregated into 4 or 5 areas to enable students spend at least 4 weeks in a place.



B.Sc. Health Care Administration and Hospital Management

Overview

Healthcare Administration and Hospital Management Programme teaches subjects that bear on effectiveness and efficiency of healthcare industry. It draws from the disciplines of natural, basic medical and allied health sciences. This programme provides students with in-depth knowledge and understanding of leadership and managerial approaches to the team and organisational development across a variety of healthcare contexts. The programme teaches students the complexity of how to manage teams across many departments while improving overall patient care and safety. It gives opportunity to expand knowledge and make the move into leadership within the healthcare management.

Students will gain an understanding of the challenges faced by healthcare professionals whilst also gaining management skills that will equip them to progress their career to the next level. Students will also learn to lead quality improvement efforts, examine technological tools, and facilitate strategic development throughout health care systems. Consequently, students are equipped with the skills they need to run a clinically effective and cost-efficient health care delivery system as well as discover how to apply business concepts to the healthcare services industry.

Philosophy

The general philosophy of this programme is to produce graduates who can explore the interaction between labour environment, societal responsibility and healthcare policies to bring about harmony and efficiency in healthcare organisations, which are required for provision of quality healthcare, patient safety and personnel motivation. Graduates will be exposed to techniques of critically articulating arguments, demonstrating logical and structured approaches supported by evidence and scrutinizing healthcare industry in order to make a difference in healthcare environments.

Objectives

Graduates of the programme will be able to:

1. demonstrate knowledge and skills in the field of health care administration and hospital management;
2. apply self-reliance and managerial skills required for effective service delivery in competitive local, national and international environment;
3. apply ICT in marketing, human resource, economic, social, financial and innovative strategies for improving the operations of healthcare programme and hospital management for the purpose of efficiency and effectiveness;
4. develop ethical and professional solutions for healthcare business challenges;
5. engage in entrepreneurship and income yielding ventures; and
6. engage in cutting edge research and development activities which are able to project the University and Nation in the light of excellence.



Unique Features of the Programme

The programme offers opportunity for exposure to broad knowledge and skills for effective and efficient healthcare administration and hospital management in one programme. This is in comparison to programmes offering Bachelor of Science Degree in Healthcare Management, Healthcare Administration or Hospital Management separately and singly in top universities around the world.

Employability Skills

Graduates of the programme are highly sought after by employers from a wide range of careers in business and health. Successful students would engage in careers in the public, private and community healthcare services globally - building their careers in a variety of management contexts such as hospital, project or programme management. The programme serves to improve career prospects of graduates and their earning potential with a mix of key skills that are directly transferable to the workplace. Specifically, the programme offers graduates opportunity to handle responsibilities of entry-level to mid-level administration positions in healthcare organisations such as:

1. hospitals;
2. nursing homes;
3. ambulatory care facilities;
4. physician practices;
5. insurance organisations;
6. health-related research and development firms; and
7. pharmaceutical and medical equipment companies.

21st Century Skills

1. Collaboration and team work
2. Creativity and imagination
3. Critical thinking
4. Problem solving
5. Flexibility and adaptability
6. Information Literacy
7. Leadership
8. Civic literacy and citizenship
9. Social responsibility
10. Technology literacy
11. Initiative

Admission and Graduation Requirements

Four-Year Degree Programme

Minimum of five credit level passes including English Language, Mathematics, Biology, Physics and Chemistry at Senior Secondary Certificate (SSC) in not more than two sittings. In addition, aggregate pass of at least 50% in English Language, Biology, Physics and Chemistry in the UTME conducted by the Joint Admission and Matriculation Board (JAMB).



Direct Entry (Three-Year Degree Programme): to be admitted for Direct Entry, a candidate must possess:

- i) Advanced Level Certificate at not less than B grade in Biology, Physics and Chemistry.
- ii) First degree in relevant discipline.

Programme Duration

For candidates admitted through the UTME mode, the minimum duration of programme is four (4) years (eight consecutive semesters). For candidates admitted through direct entry mode, the minimum duration of the programme is three (3) years (six consecutive semesters).

Graduation requirements

The minimum number of credit units for the award of a degree is 120 credit units for UTME students and 90 credit units for Direct Entry students, subject to the usual Department and Faculty requirements and duration of study. A student shall therefore qualify for the award of a degree when he has met the conditions.

At the end of the 3rd year of the programme, students would be presented and technically supported to pass the membership professional examination of the Chartered Institute of Administration and Chartered Institute of Hospital Management.

Global Course Structure

100 Level

| Course Code | Course Title | Unit(s) | Status | LH | PH |
|-------------|----------------------------------|-----------|--------|----|----|
| GST 111 | Communication in English | 2 | C | 15 | 45 |
| GST 112 | Nigerian Peoples and Culture | 2 | C | 30 | - |
| BIO 101 | General Biology I | 2 | C | 30 | - |
| BIO 102 | General Biology II | 2 | C | 30 | - |
| BIO 107 | General Biology Practical I | 1 | C | - | 45 |
| BIO 108 | General Biology Practical II | 1 | C | - | 45 |
| CHM 101 | General Chemistry I | 2 | C | 30 | - |
| CHM 102 | General Chemistry II | 2 | C | 30 | - |
| CHM 107 | General Chemistry Practical I | 1 | C | - | 45 |
| CHM 108 | General Chemistry Practical II | 1 | C | - | 45 |
| COS 101 | Introduction to Computer Science | 3 | C | 30 | 45 |
| MTH 101 | Elementary Mathematics | 2 | C | 30 | - |
| PHY 101 | General Physics I | 2 | C | 30 | - |
| PHY 107 | General Physics Practical I | 1 | C | - | 45 |
| PHY 102 | General Physics II | 2 | C | 30 | - |
| PHY 108 | General Physics Practical II | 1 | C | - | 45 |
| | Total | 27 | | | |



200 Level

| Course Code | Course Title | Unit(s) | Status | LH | PH |
|-------------|---|-----------|--------|----|----|
| GST 212 | Philosophy, Logic, and Human Existence | 2 | C | 30 | - |
| ENT 211 | Entrepreneurship and Innovation | 2 | C | 30 | - |
| ANA 201 | Anatomy of Upper and Lower Limbs | 3 | C | 30 | 45 |
| BCH 201 | General Biochemistry I | 2 | C | 30 | - |
| BCH 203 | General Biochemistry Practical I | 1 | C | - | 45 |
| PIO 201 | Introductory Physiology and Blood | 2 | C | 30 | |
| HAM 211 | Ecology and General Introduction to Health Care/Hospital Administration | 2 | C | 30 | - |
| HAM 212 | Strategic Planning and Management in Public and Private Hospital | 2 | C | 30 | - |
| HAM 221 | Human Resources Management in Healthcare Organisation | 2 | C | 30 | - |
| HAM 222 | Logistics Management of Health Commodity | 2 | C | 30 | - |
| HAM 223 | Time, units and space management in hospital and health care | 2 | C | 30 | - |
| HAM 225 | Public Relations in Hospital Management | 2 | C | 30 | - |
| | Total | 24 | | | |

300 Level

| Course Code | Course Title | Unit(s) | Status | LH | PH |
|-------------|--|-----------|--------|----|-----|
| ENT 312 | Venture Creation | 2 | C | 15 | 45 |
| GST 312 | Peace and Conflict Resolution | 2 | C | 30 | - |
| HAM 311 | Revenue Cycle Management | 2 | C | 30 | - |
| HAM 312 | Labour Relations and Collective Bargaining | 2 | C | 30 | - |
| ITH 307 | Survey of Medical Informatics | 2 | C | 30 | - |
| HAM 316 | Hospital Economics, Finance and Budgeting | 2 | C | 30 | - |
| HAM 317 | Patient Rights and Health Care Practice | 2 | C | 30 | - |
| HAM 321 | Healthcare Management Practicum (SIWES) | 6 | C | - | 270 |
| | Total | 20 | | | |



400 Level

| Course Code | Course Title | Unit(s) | Status | LH | PH |
|----------------------|---|-----------|--------|----|-----|
| HAM 411 | Labour Economics | 2 | C | 30 | - |
| HAM 401 | Research Methodology | 2 | C | 30 | - |
| HAM 412 | Industrial Psychology | 2 | C | 30 | - |
| HAM 413 (GST 224) | Leadership Skills | 2 | C | 30 | - |
| HAM 414 | Health Care, Hospital Ethics and Administrative law | 2 | C | 30 | - |
| HAM 499 | Project | 6 | C | - | 270 |
| | Total | 16 | | | |

Course Contents and Learning Outcomes

GST 111: Communication in English

(2 Units C: LH 15; PH 45)

Learning Outcomes

At the end of the course, the student should be able to:

1. identify possible sound patterns in English Language;
2. list notable Language skills;
3. classify word formation processes;
4. construct simple and fairly complex sentences in English;
5. apply logical and critical reasoning skills for meaningful presentations;
6. demonstrate an appreciable level of the art of public speaking and listening; and
7. write simple and technical reports.

Course Contents

Sound patterns in English Language (vowels and consonants, phonetics and phonology). English word classes (lexical and grammatical words, definitions, forms, functions, usages, collocations). Sentence in English (types: structural and functional, simple and complex). Grammar and usage (tense, mood, modality and concord, aspects of language use in everyday life). Logical and critical thinking and reasoning methods (logic and syllogism, inductive and deductive argument and reasoning methods, analogy, generalisation and explanations). Ethical considerations, copyright rules and infringements. Writing activities: (pre-writing, writing, post writing, editing and proofreading; brainstorming, outlining, paragraphing, types of writing, summary, essays, letter, curriculum vitae, report writing, note making and many others. Mechanics of writing). Comprehension strategies: (reading and types of reading, comprehension skills, 3rsq). Information and communication technology in modern language learning. Language skills for effective communication. Major word formation processes. Writing and reading comprehension strategies. Logical and critical reasoning for meaningful presentations. Art of public speaking and listening.



GST 112: Nigerian People and Culture

(2 Units C: LH 30)

Learning Outcomes

At the end of the course, the student should be able to:

1. analyse the historical foundation of the Nigerian culture and arts in pre-colonial times;
2. list and identify the major linguistic groups in Nigeria;
3. explain the gradual evolution of Nigeria as a political unit;
4. analyse the concepts of Trade, Economic and Self-reliance status of the Nigerian peoples towards national development;
5. enumerate the challenges of the Nigerian State towards Nation building;
6. analyse the role of the Judiciary in upholding people's fundamental rights;
7. identify acceptable norms and values of the major ethnic groups in Nigeria; and
8. list and suggest possible solutions to identifiable Nigerian environmental, moral and value problems.

Course Contents

Nigerian history, culture and art up to 1800 (Yoruba, Hausa and Igbo peoples and culture; peoples and culture of the ethnic minority groups). Nigeria under colonial rule (advent of colonial rule in Nigeria; Colonial administration of Nigeria). Evolution of Nigeria as a political unit (amalgamation of Nigeria in 1914; formation of political parties in Nigeria; Nationalist movement and struggle for independence). Nigeria and challenges of nation building (military intervention in Nigerian politics; Nigerian Civil War). Concept of trade and economics of self-reliance (indigenous trade and market system; indigenous apprenticeship system among Nigerian people; trade, skill acquisition and self-reliance). Social justices and national development (law definition and classification. Judiciary and fundamental rights. Individual, norms and values (basic Nigeria norms and values, patterns of citizenship acquisition; citizenship and civic responsibilities; indigenous languages, usage and development; negative attitudes and conducts. Cultism, kidnapping and other related social vices). Re-orientation, moral and national values (The 3R's – Reconstruction, Rehabilitation and Re-orientation). Re-orientation Strategies: Operation Feed the Nation (OFN), Green Revolution, Austerity Measures, War Against Indiscipline (WAI), War Against Indiscipline and Corruption(WAIC), Mass Mobilisation for Self-Reliance, Social Justice and Economic Recovery (MAMSER), National Orientation Agency (NOA). Current socio-political and cultural developments in Nigeria.

BIO 101: General Biology I

(2 Units C: LH 30)

Learning Outcomes

At the end of lectures, students should be able to:

1. explain cell's structure and organisations;
2. summarise functions of cellular organelle;
3. characterise living organisms and state their general reproduction;
4. describe the interrelationship that exists between organisms;
5. discuss the concept of heredity and evolution; and
6. enumerate habitat types and their characteristics.



Course Contents

Cell structure and organisation. functions of cellular organelles. characteristics and classification of living things. chromosomes, genes their relationships and importance. General reproduction. Interrelationships of organisms (competitions, parasitism, predation, symbiosis, commensalisms, mutualism, saprophytism). Heredity and evolution (introduction to Darwinism and Lamarckism, Mendelian laws, explanation of key genetic terms). Elements of ecology and types of habitat.

BIO 102: General Biology II

(2 Units C: LH 30)

Learning Outcomes

At the end of the lectures, students should be able to:

1. List the characteristics, methods of identification and classification of Viruses, bacteria and fungi;
2. state the unique characteristics of plant and animal kingdoms;
3. describe ecological adaptations in the plant and animal kingdoms;
4. explain nutrition, respiration, excretion and reproduction in plants and animals; and
5. describe growth and development in plants and animals.

Course Contents

Basic characteristics, identification and classification of viruses, bacteria and fungi. A generalised survey of the plant and animal kingdoms based mainly on the study of similarities and differences in the external features. Ecological adaptations. Briefs on physiology to include nutrition, respiration, circulatory systems, excretion, reproduction, growth and development.

BIO 107: General Biology Practical I

(1 Unit C: PH 45)

Learning Outcomes

At the end of the course, students should be able to:

1. outline common laboratory hazards;
2. provide precautions on laboratory hazards;
3. state the functions of the different parts of microscope;
4. use the microscope and describe its maintenance;
5. draw biological diagrams and illustrations; and
6. apply scaling and proportion to biological diagrams.

Course Contents

Common laboratory hazards: prevention and first aid. Measurements in biology. Uses and care of microscope. Compound and dissecting microscope. Biological drawings and illustration, scaling, accuracy and proportion; use of common laboratory apparatus and laboratory experiments designed to illustrate the topics covered in BIO 101.



BIO 108: General Biology Practical II

(1 Unit C: PH 45)

Learning Outcomes

At the end of the course, students should be able to:

1. describe the anatomy of flowering plants;
2. differentiate types of fruit and seeds;
3. state ways of handling and caring for biological wares;
4. describe the basic histology of animal tissues; and
5. identify various groups in the animal kingdom.

Course Contents

Anatomy of flowering plants, primary vegetative body: stem, leaf and root to show the mature tissues namely parenchyma, collenchyma, sclerenchyma, xylem and phloem. Types of fruits and seeds. Care and use of dissecting kits and other biological wares. Dissection and general histology of animal tissues based on vertebrate forms. Morphology and functions of epithelial, muscular, nervous and connective tissues. Examination of various groups of lower invertebrates under microscopes, identification of various groups of organisms in Animal Kingdom. And any experiment designed to emphasize the practical aspects of topics in BIO 102.

CHM 101: General Chemistry I

(2 Units C: LH 30)

Learning Outcomes

At the end of this course, the students should be able to:

1. define atom, molecules and chemical reactions;
2. discuss the Modern electronic theory of atoms;
3. write electronic configurations of elements on the periodic table;
4. rationalise the trends of atomic radii, ionization energies, electronegativity of the elements based on their position in the periodic table;
5. identify and balance oxidation – reduction equation and solve redox titration problems.
6. draw shapes of simple molecules and hybridized orbitals;
7. identify the characteristics of acids, bases and salts, and solve problems based on their quantitative relationship;
8. apply the principles of equilibrium to aqueous systems using Le Chatelier's principle to predict the effect of concentration, pressure and temperature changes on equilibrium mixtures;
9. analyse and perform calculations with the thermodynamic functions, enthalpy, entropy and free energy; and
10. determine rates of reactions and its dependence on concentration, time and temperature.

Course Contents

Atoms, molecules and chemical reactions. Modern electronic theory of atoms. Electronic configuration, periodicity and building up of the periodic table. Hybridization and shapes of simple molecules. Valence Forces. Structure of solids. Chemical equations and stoichiometry. Chemical bonding and intermolecular forces. Kinetic theory of matter. Elementary thermochemistry. Rates of reaction. Equilibrium and thermodynamics. Acids, bases and salts. Properties of gases. Redox reactions and introduction to electrochemistry. Radioactivity.



CHM 102: General Chemistry II

(2 Units C: LH 30)

Learning Outcomes

At the end of this course, the students should be able to:

1. state the importance and development of organic chemistry;
2. define fullerenes and its applications;
3. discuss electronic theory;
4. determine the qualitative and quantitative of structures in organic chemistry;
5. describe rules guiding nomenclature and functional group classes of organic chemistry;
6. determine rate of reaction to predict mechanisms of reactions;
7. identify classes of organic functional group with brief description of their chemistry;
8. discuss comparative chemistry of group 1A, IIA and IVA elements; and
9. describe basic properties of Transition metals.

Course Contents

Historical survey of the development and importance of Organic Chemistry. Fullerenes as fourth allotrope of carbon, uses as nanotubes, nanostructures, nanochemistry. Electronic theory in organic chemistry. Isolation and purification of organic compounds. Determination of structures of organic compounds including qualitative and quantitative analysis in organic chemistry. Nomenclature and functional group classes of organic compounds. Introductory reaction mechanism and kinetics. Stereochemistry. The chemistry of alkanes, alkenes, alkynes, alcohols, ethers, amines, alkyl halides, nitriles, aldehydes, ketones, carboxylic acids and derivatives. The Chemistry of selected metals and non-metals. Comparative chemistry of group IA, IIA and IVA elements. Introduction to transition metal chemistry.

CHM 107: General Chemistry Practical I

(1 Unit C: PH 45)

Learning Outcomes

At the end of the course the students should be able to:

1. state the general laboratory rules and safety procedures;
2. collect scientific data and correctly carrying out Chemical experiments;
3. identify the basic glassware and equipment in the laboratory;
4. state the differences between primary and secondary standards;
5. perform redox titration;
6. recording observations and measurements in the laboratory notebooks; and
7. analyse the data to arrive at scientific conclusions.

Course Contents

Laboratory experiments designed to reflect topics presented in courses CHM 101 and CHM 102. These include acid-base titrations, qualitative analysis, redox reactions, gravimetric analysis, data analysis and presentation.



CHM 108: General Chemistry Practical II

(1 Unit C: PH 45)

Learning Outcomes

At the end of this course, the students should be able to:

1. identify the general laboratory rules and safety procedures;
2. collect scientific data and correctly carrying out Chemical experiments;
3. identify the basic glassware and equipment in the laboratory;
4. identify and carry out preliminary tests which includes ignition, boiling point, melting point, test on known and unknown organic compounds;
5. perform solubility tests on known and unknown organic compounds;
6. conduct elemental tests on known and unknown compounds; and
7. conduct functional group/confirmatory test on known and unknown compounds which could be acidic / basic / neutral organic compounds.

Course Contents

Continuation of CHM 107. Additional laboratory experiments to include functional group analysis, quantitative analysis using volumetric methods.

COS 101: Introduction to Computing Sciences

(3 Units C: LH 30; PH 45)

Learning Outcomes

At the end of the course, students should be able to:

1. explain basic components of computers and other computing devices;
2. describe the various applications of computers;
3. explain information processing and its roles in the society;
4. describe the Internet, its various applications and its impact;
5. explain the different areas of the computing discipline and its specialisations; and
6. demonstrate practical skills on using computers and the internet.

Course Contents

Brief history of computing. Description of the basic components of a computer/computing device. Input/Output devices and peripherals. Hardware, software and human ware. Diverse and growing computer/digital applications. Information processing and its roles in society. The Internet, its applications and its impact on the world today. The different areas/programs of the computing discipline. The job specialisations for computing professionals. The future of computing.

Lab Work: Practical demonstration of the basic parts of a computer. Illustration of different operating systems of different computing devices including desktops, laptops, tablets, smart boards and smart phones. Demonstration of commonly used applications such as word processors, spreadsheets, presentation software and graphics. Illustration of input and output devices including printers, scanners, projectors and smartboards. Practical demonstration of the Internet and its various applications. Illustration of browsers and search engines. How to access online resources.



MTH 101: Elementary Mathematics (Algebra and Trigonometry) (2 Units C: LH 30)

Learning Outcomes

At the end of the course students should be able to:

1. explain basic definition of Set, Subset, Union, Intersection, Complements and use of Venn diagrams;
2. solve quadratic equations;
3. solve trigonometric functions;
4. identify various types of numbers; and
5. solve some problems using Binomial theorem.

Course Contents

Elementary set theory; subset, union, intersection, complements, venn diagrams. Real numbers; Integers, Rational and Irrational numbers, mathematical induction, Sequences and Series, Theory of Quadratic equations, Binomial theorem. Complex numbers; Algebra of complex numbers; the Argand Diagram. De-Moivre's theorem, nth roots of unity, Circular measure, Trigonometric functions of angles of any magnitude, addition and factor formulae.

PHY 101: General Physics I (Mechanics)

(2 Units C: LH 30)

Learning Outcomes

At the end of the course, student should be able to;

1. identify and deduce the physical quantities and their units;
2. differentiate between vectors and scalars;
3. describe and evaluate motion of systems on the basis of the fundamental laws of mechanics;
4. apply Newton's laws to describe and solve simple problems of motion;
5. evaluate work, energy, velocity, momentum, acceleration, and torque of moving or rotating objects;
6. explain and apply the principles of conservation of energy, linear and angular momentum;
7. describe the laws governing motion under gravity; and
8. explain motion under gravity and quantitatively determine behaviour of objects moving under gravity.

Course Contents

Space and time. Units and dimension, Vectors and Scalars. Differentiation of vectors: displacement, velocity and acceleration. Kinematics. Newton laws of motion (Inertial frames, Impulse, force and action at a distance, momentum conservation). Relative motion. Application of Newtonian mechanics. Equations of motion. Conservation principles in physics. Conservative forces. Conservation of linear momentum. Kinetic energy and work. Potential energy. System of particles. Centre of mass. Rotational motion: Torque, vector product, moment, rotation of coordinate axes and angular momentum. Polar coordinates. Conservation of angular momentum. Circular motion. Moments of inertia. gyroscopes and precession. Gravitation: Newton's Law of Gravitation. Kepler's Laws of Planetary Motion. Gravitational Potential Energy. Escape velocity. Satellites motion and orbits.



PHY 102: General Physics II (Electricity & Magnetism)

(2 Units C: LH 30)

Learning Outcomes

At the end of this course, the student should be able to:

1. describe the electric field and potential, and related concepts, for stationary charges;
2. calculate electrostatic properties of simple charge distributions using Coulomb's law, Gauss's law and electric potential;
3. describe and determine the magnetic field for steady and moving charges;
4. determine the magnetic properties of simple current distributions using Biot-Savart and Ampere's law;
5. describe electromagnetic induction and related concepts, and make calculations using Faraday and Lenz's laws;
6. explain the basic physical of Maxwell's equations in integral form;
7. evaluate DC circuits to determine the electrical parameters; and
8. determine the characteristics of ac voltages and currents in resistors, capacitors, and Inductors.

Course Contents

Forces in nature. Electrostatics; electric charge and its properties, methods of charging. Coulomb's law and superposition. electric field and potential. Gauss's law. Capacitance. Electric dipoles. Energy in electric fields. Conductors and insulators, current, voltage and resistance. Ohm's law and analysis of DC circuits. Magnetic fields. Lorentz force. Biot-Savart and Ampère's laws. magnetic dipoles. Dielectrics. Energy in magnetic fields. Electromotive force. Electromagnetic induction. Self and mutual inductances. Faraday and Lenz's laws. Step up and step-down transformers: Maxwell's equations. Electromagnetic oscillations and waves. AC voltages and currents applied to inductors, capacitors, resistance, and combinations.

PHY 107: General Practical Physics I

(1 Unit C: PH 45)

Learning Outcomes

At the end of the course, the student should be able to;

1. conduct measurements of some physical quantities;
2. make observations of events, collect and tabulate data;
3. identify and evaluate some common experimental errors;
4. plot and analyse graphs; and
5. draw conclusions from numerical and graphical analysis of data.

Course Contents

This introductory course emphasises quantitative measurements. The treatment of measurement errors, and graphical analysis. A variety of experimental techniques should be employed. The experiments include studies of meters, the oscilloscope, mechanical systems, electrical and mechanical resonant systems. Light. Heat. Viscosity and many others, covered in PHY 101 and PHY 102. However, emphasis should be placed on the basic physical techniques for observation, measurements, data collection, analysis and deduction.



PHY 108: General Practical Physics II

(1 Unit C: PH 45)

Learning Outcomes

At the end of this course, the student should be able to:

1. conduct measurements of some physical quantities;
2. make observations of events, collect and tabulate data;
3. identify and evaluate some common experimental errors;
4. plot and analyse graphs;
5. draw conclusions from numerical and graphical analysis of data; and
6. prepare and present practical reports.

Course Contents

This practical course is a continuation of PHY 107 and is intended to be taught during the second semester of the 100 level to cover the practical aspect of the theoretical courses that have been covered with emphasis on quantitative measurements. The treatment of measurement errors, and graphical analysis. However, emphasis should be placed on the basic physical techniques for observation, measurements, data collection, analysis and deduction.

200 Level

GST 212: Philosophy, Logic and Human Existence

(2 Units C: LH 30)

Learning Outcomes

A student who has successfully gone through this course should be able to:

1. describe the basic features of philosophy as an academic discipline;
2. identify the main branches of philosophy & the centrality of logic in philosophical discourse;
3. explain the elementary rules of reasoning;
4. distinguish between valid and invalid arguments;
5. think critically and assess arguments in texts, conversations and day-to-day discussions;
6. critically assess the rationality or otherwise of human conduct under different existential conditions;
7. develop the capacity to extrapolate and deploy expertise in logic to other areas of knowledge; and
8. guide his or her actions, using the knowledge and expertise acquired in philosophy and logic.

Course Contents

Scope of philosophy; notions, meanings, branches and problems of philosophy. Logic as an indispensable tool of philosophy. Elements of syllogism, symbolic logic— the first nine rules of inference. Informal fallacies, laws of thought, nature of arguments. Valid and invalid arguments, logic of form and logic of content — deduction, induction and inferences. Creative and critical thinking. Impact of philosophy on human existence. Philosophy and politics, philosophy and human conduct, philosophy and religion, philosophy and human values, philosophy and character molding, and many others.



ENT 211: Entrepreneurship and Innovation

(2 Units C: LH 30)

Learning Outcomes

At the end of the course, the student should be able to:

1. explain the concepts and theories of entrepreneurship, intrapreneurship, opportunity seeking, new value creation, and risk taking;
2. state the characteristics of an entrepreneur;
3. analyse the importance of micro and small businesses in wealth creation, employment, and financial independence;
4. engage in entrepreneurial thinking;
5. identify key elements in innovation;
6. describe stages in enterprise formation, partnership and networking including business planning;
7. describe contemporary entrepreneurial issues in Nigeria, Africa and the rest of the world; and
8. state the basic principles of e-commerce.

Course Contents

Concept of entrepreneurship (entrepreneurship, intrapreneurship/corporate entrepreneurship). Theories, rationale and relevance of entrepreneurship (Schumpeterian and other perspectives, risk-taking, necessity and opportunity-based entrepreneurship and creative destruction). Characteristics of Entrepreneurs (opportunity seeker, risk taker, natural and nurtured, problem solver and change agent, innovator and creative thinker). Entrepreneurial thinking (critical thinking, reflective thinking, and creative thinking). Innovation (concept of innovation, dimensions of innovation, change and innovation, knowledge and innovation). Enterprise formation, partnership and networking (basics of business plan, forms of business ownership, business registration and forming alliances and joint ventures). Contemporary entrepreneurship issues (knowledge, skills and technology, intellectual property, virtual office, networking). Entrepreneurship in Nigeria (Biography of inspirational entrepreneurs, youth and women entrepreneurship, entrepreneurship support institutions, youth enterprise networks and environmental and cultural barriers to entrepreneurship). Basic principles of e-commerce.

ANA 201: Anatomy of Upper and Lower Limbs

(3 Units C: LH 30; PH 45)

Learning outcomes

At the end of the course, the student should be able to:

1. define fundamental anatomical terminology and discuss the anatomical position;
2. describe the anatomy of the musculoskeletal system, including the axial skeleton; appendicular skeleton, appendicular and axial muscles, and arthrology;
3. describe the general features of the bones of the upper and lower limbs;
4. identify the major muscles of the upper and lower limbs;
5. explain the types and structure of the joints of the upper and lower limbs;
6. correlate between the attachment of the muscles and their functions on the different joints;
7. identify the major nerves of the upper and lower limbs;
8. describe the functional components of each of the major nerves and its distribution;
9. identify and describe the course of the major superficial veins of the upper and lower limbs; and
10. name the major arteries of the upper and lower limbs.



Course Contents

Descriptive terms, plans and terms of relationship of the human body, terms of comparison, attachment of muscles, types of muscles, movements of joints. Osteology, principles of kinesiology, general organization of body system. Cutaneous innervation of the upper limb; pectoral region; breast; axilla; shoulder region; arm and cubital fossa; flexor compartment of forearm; extensor compartment of forearm; hand; venous and lymphatic drainage of the upper limb. Applied anatomy of nerves; blood supply of the upper limb. Cutaneous innervation of the lower limb; femoral triangle; adductor canal and medial side of the thigh; gluteal region; back of the thigh, popliteal fossa; extensor compartment of the leg and dorsum of the foot; peroneal and flexor compartment of the leg; sole of the foot, arches of the foot; mechanism of walking; venous and lymphatic drainage of the lower limb; applied anatomy of the nerves and blood supply to the lower limb.

BCH 201: General Biochemistry I

(2 Units C: LH 30)

Learning Outcomes

At the end of the course, the student should be able to:

1. explain the structure of different macromolecules in biological system;
2. identify types of chemical reactions involving these macromolecules;
3. explain the various methods of isolation of these macromolecules;
4. estimate the effects of acids and alkalis on the macromolecules;
5. describe purification the macromolecules; and
6. learn how to quantify the various macromolecules.

Course Contents

Introductory chemistry of amino acids; their properties, reactions and biological functions. Classification of amino acids: neutral, basic and acidic; polar and non-polar; essential and non-essential amino acids. Peptides. Introductory chemistry and classification of proteins. Biological functions of proteins. Methods of their isolation, purification and identification. Primary, secondary, tertiary and quaternary structures of proteins. Basic principles of tests for proteins and amino acids. Introductory chemistry of carbohydrates, lipids and nucleic acids. Nomenclature of nucleosides, and nucleotides. Effects of acid and alkali on hydrolysis of nucleic acids.

CH 203: General Biochemistry Practical I

(1 Unit C: PH 45)

Learning Outcomes

At the end of the course, the student should be able to:

1. describe the various laboratory procedures used in the study of various biochemical processes described in BCH 201.



Course Contents

Laboratory experiments designed to reflect the topics covered in BCH 201. Introduction to laboratory methods and procedures employed in studying biochemical processes.

PIO 201 Introductory Physiology and Blood

(2 Units C: LH 30)

Learning Outcomes

At the end of the course, the student should be able to:

1. describe the composition of a cell membrane;
2. explain how a potential difference across a membrane will influence the distribution of a cation and an anion;
3. describe how transport rates of certain molecules and ions are accelerated by specific membrane transport proteins;
4. distinguish between active (primary and secondary) transport, facilitated diffusion, and passive diffusion based on energy source and carrier protein involvement;
5. identify the mechanisms and role of selective transporters for amino acids, neurotransmitters, nutrients, etc;
6. discuss the general concepts of homeostasis and the principles of positive and negative feedback in physiological systems;
7. identify the site of erythropoietin production, the stimulus for its release, and the target tissue for erythropoietin action;
8. discuss the normal balance of red blood cell synthesis and destruction, including how imbalances in each lead to anemia or polycythemia;
9. list and differentiate the various types of leukocytes;
10. describe the role of thrombocytes in haemostasis; and
11. list clotting factors and the discuss the mechanism of anti-coagulants.

Course Contents

Introduction and history of physiology. Structure and functions of cell membranes. Transport process, special transport mechanism in amphibian bladder, kidney, gall bladder, intestine, astrocytes and exocrine glands. Biophysical principles. Homeostasis and control systems including temperature regulation, biological rhythms, composition and functions of blood haemopoiesis. WBC and differential count, plasma proteins, coagulation fibrinolysis and platelet functions. Blood groups –ABO system – Rh system – blood transfusion – indication for collection and storage of blood, hazards of blood transfusions. Reticulo-endothelial system, immunity and immunodeficiency disease and HIV.

HAM 211: Ecology and General Introduction to Health Care/Hospital Administration (2 Units C: LH 30)

Learning Outcomes

At the end of the course, the student should be able to:

1. describe ecology of Health Care/Hospital Administration; and
2. discuss characteristics of the environment of Health Care/Hospital Administration.



Course Contents

Historical background of hospital administration. Duties of the hospital administrator. Responsibilities and specialisations. Required competence. Job opportunities. Scheme of service. Professionalism. Challenges.

HAM 212: Strategic Planning and Management in Public and Private Hospitals (2 Units C: LH 30)

Learning Outcomes

At the end of the course, the student should be able to:

1. explain the concepts of corporate planning;
2. explain the relationship between corporate planning and organisational effectiveness;
3. discuss the concept of internal and external environments of an organisation;
4. explain how organisational environment affect performance; and
5. develop a Strategic plan for public/private hospitals.

Course Contents

Techniques and skills of Corporate Planning. Field exercise in one real-life health organisation in Nigeria. Empirical studies or works toward investigating the relationship between corporate planning and organisational effectiveness. Background concepts including strategy, mission, goals and objectives, long range planning, tactical operational planning. Definitions of planning and health care system. Purpose of health care system, planning process and planning problems of health care system issues, basic conceptual frame work of health care system planning (Green's stage hypothesis). Development of mission statement. Setting goal and objective and management by objective, including policy formulation. Implementation, monitoring and evaluation. Holistic approach to the changing corporate terrain of Hospital as a Business entity. A balanced coverage of internal and external environments. Global view and multidisciplinary perspective of the hospital business world. Formal planning and identification of hospitals capabilities and timely strategies. Integrative learning experience to develop strategic environment, knowledge and skills. Key elements in strategy, concepts and theories. Overview of corporate policy and strategy analysis, the relationship between the hospital and its environment, strategic choice, the link between strategy and organisation of strategic change. Illustration of the strategic management process with a wide variety of practical examples. Strategy and strategic management. Strategic management processes formality in strategic management process, strategic management pyramid/model. Strategy versus other types of planning for public and non-profit organisations. Environmental scanning, internal analysis and position assessment. Mission statement, strategy formulation, strategic thinking and strategic systems in the health sector.

HAM 221: Human Resources Management in Healthcare Organisation (2 Units C: LH 30)

Learning Outcomes

At the end of the course, the student should be able to:

1. describe methods of human resource development;
2. discuss approaches to retention and maintenance of health staff; and
3. discuss factors affecting human resource development.



Course Contents

Nature of human resource development process. Features of the organisation (including leadership and managerial style, organisational culture, organisational climate), and its environment (including social, economic, technological, regulatory and political factors) and their influence human resource development. An understanding of the purposes, main stages, techniques and information sources of human resource planning. Identifying the main factors influencing human resource development. Evaluate policies and practices adopted to achieve human resource plans and development. Issues relating to hospital human resource management in terms of manpower planning, personnel selection and development. Performance appraisal, compensation and employee motivation.

HAM 222: Logistics Management of Health Commodity

(2 Units C: LH 30)

Learning Outcomes

At the end of the course, the student should be able to:

1. distinguish between logistics and supply chain management;
2. prepare inventory of equipment and consumables; and
3. practice procurement procedures.

Course Contents

Fundamentals of Logistics & Supply Chain Management. Distinction between Logistics & Supply Chain Management. Procurement. Inventory Management. Equipment Sourcing. Lean Management. Definition and scope of purchasing and supply. The economics of purchasing. The techniques, procedures and documentation for requisitioning. Ordering receiving, inspection, storage and issue of supplies. Scope of stores and inventory management. Stock systems. Laws relating to contract and sale of goods.

HAM 223: Time, Units and Space Management in Hospital and Health Care (2 Units C: LH 30)

Learning Outcomes

At the end of the course, the student should be able to:

1. describe the concept of time, units and space management in hospital and health care;
2. collect data required for time, units and space management in hospital and health care; and
3. practice time, units and space management in hospital and health care.

Course Contents

Management of an organisation's time, units and physical space inventory. Tracking of how much time and space an organisation has. Managing occupancy information, and creating spatial plans. Concept of time, units and space management in hospital and health care. Use of data on time, units and space for planning and designing hospital setting. Components of space management planning.



HAM 225: Public Relations in Hospital Management

(2 Units C: LH 30)

Learning Outcomes

At the end of the course, the student should be able to:

1. discuss roles of public relations unit in healthcare setting;
2. demonstrate effective and efficient Inter and Intra departmental relationship; and
3. promote the image of a hospital in the public.

Course Contents

Dominant paradigms and theories that have informed the study of public relations and continue to shape analysis and practice in the field. Concept of public relations. Roles of public relation unit in the hospital. Inter and intra departmental relationship in the hospital. Public relation strategies. Roles of hospital managers in public relations and corporate social responsibility.

GST 312: Peace and Conflict Resolution

(2 Units C: LH 30)

Learning Outcomes

At the end of the course, the student should be able to:

1. analyse the concepts of peace, conflict and security;
2. discuss the major forms, types and root causes of conflict and violence;
3. differentiate between conflict and terrorism;
4. enumerate security and peace building strategies; and
5. describe roles of international organisations, media and traditional institutions in peace building.

Course Contents

Concepts of peace, conflict and security in a multi-ethnic nation. Types and Theories of Conflicts: ethnic, religious, economic, geo-political conflicts. Structural conflict theory. Realist theory of conflict, frustration-aggression conflict theory. Root causes of conflict and violence in Africa. Indigene and settlers phenomenon. Boundaries/boarder disputes. Political disputes. Ethnic disputes and rivalries. Economic inequalities. Social disputes. Nationalist movements and agitations. Selected conflict case studies – Tiv-Junkun, Zango Kartaf, chieftaincy and land disputes and many others. Peace building. Management of conflicts and security. Peace & human development. Approaches to peace & conflict management --- (religious, government, community leaders and many others). Elements of Peace Studies and Conflict Resolution. Conflict dynamics assessment scales: constructive & destructive. Justice and legal framework. Concepts of social justice. The Nigeria legal system. Insurgency and terrorism. Peace mediation and peace keeping. Peace & security council (International, National and Local levels). Agents of Conflict resolution. Conventions, Treaties, Community Policing: Evolution and Imperatives. Alternative Dispute Resolution (ADR). a. Dialogue b. Arbitration c. Negotiation d. Collaboration and many others. Roles of international organisations in conflict resolution. (a). The United Nations, UN and its Conflict Resolution Organs. (b). The African Union & Peace Security Council (c). ECOWAS in peace keeping. Media and Traditional Institutions in Peace Building. Managing post-conflict situations/crisis. Refugees. Internally displaced persons, IDPs. The role of NGOs in post-conflict situations/crisis.



ENT 312: Venture Creation

(2 Units C: LH 15; PH 45)

Learning Outcomes

At the end of the course, the student should be able to:

1. describe the key steps in venture creation;
2. identify opportunities in problems and in high potential sectors regardless of geographical location;
3. explain how original products, ideas, and concepts are developed;
4. develop business concept for further incubation or pitching for funding;
5. identify key sources of entrepreneurial finance;
6. implement the requirements for establishing and managing micro and small enterprises;
7. conduct entrepreneurial marketing and e-commerce;
8. apply a wide variety of emerging technological solutions to entrepreneurship; and
9. appreciate why ventures fail due to lack of planning and poor implementation.

Course Contents

Opportunity identification (Sources of business opportunities in Nigeria, Environmental scanning, demand and supply gap/unmet needs/market gaps/market research, unutilised resources, social and climate conditions and technology adoption gap). New business development (business planning, market research). Entrepreneurial finance (Venture capital, equity finance, micro finance, personal savings, small business investment organisations and business plan competition). Entrepreneurial marketing and e-commerce (Principles of marketing, customer acquisition & retention, B2B, C2C and B2C models of e-commerce, first mover advantage, e-commerce business models and successful e-commerce companies). Small business management/family business: Leadership & management, basic book keeping, nature of family business and Family Business Growth Model. Negotiation and business communication (strategy and tactics of negotiation/bargaining, traditional and modern business communication methods). Opportunity discovery demonstrations (Business idea generation presentations, business idea contest, brainstorming sessions, idea pitching). Technological Solutions (The concept of market/customer solution, customer solution and emerging technologies, business applications of new technologies - Artificial Intelligence (AI), Virtual/Mixed Reality (VR), Internet of Things (IoTs), Blockchain, Cloud Computing, Renewable Energy and many others. Digital business and e-commerce strategies).

HAM 311: Revenue Cycle Management

(2 Units C: LH 30)

Learning Outcomes

At the end of the course, the student should be able to:

1. describe medical billing software;
2. track financial transactions of patients from initial contact to final payment of a balance; and
3. utilise medical billing software.

Course Contents

Financial process that healthcare systems and facilities use to track patient care episodes from registration and appointment scheduling to the final payment of a balance. Tracking revenue from patients from their initial appointment or encounter with the healthcare system to their payment of balance. Key steps and benefits of revenue cycle management. Medical billing software.



HAM 312: Labour Relations and Collective Bargaining

(2 Units C: LH 30)

Learning Outcomes

At the end of the course, the student should be able to:

1. discuss concepts and functions of collective bargaining; and
2. demonstrate skills of problem solving in an organisation.

Course Contents

Union-management relationship and the collective bargaining process. Theories, structure, functions of collective bargaining and the concepts of bargaining power and conflicts. Empirical studies in the field are surveyed. The development of problem solving skills. Role play. Case studies and psychological factors influencing bargaining outcomes, especially use of data and gravities in negotiation are also examined. Labour laws including trade union legislation.

ITH 307: Survey of Medical Informatics

(2 Units C: LH 30)

Learning Outcomes

At the end of the course, the student should be able to:

1. define Medical Informatics and explain its component competencies as they relate to various roles in the practice of medicine, including clinical care, research, and lifelong learning;
2. retrieve, appraise, and apply medical information for clinical decision-making and patient education using a variety of decision support tools and other information resources;
3. discuss the impact of the electronic health record, government systems/resources, and "big data" on patient care, biomedical research, and practice management;
4. define health literacy concepts and utilise them in patient education and communication; and
5. develop a personal information management plan that demonstrates basic knowledge of information technologies, tools, and resources.

Course Contents

Introductory survey of the discipline of biomedical informatics. Use of computers for processing, organising, retrieving and utilising biomedical information at the molecular, biological system, clinical and healthcare organisation levels. Essential concepts in biomedical informatics that are derived from medicine, computer science and the social sciences.

HAM 316: Hospital Economics, Finance and Budgeting

(2 Units C: LH 30)

Learning Outcomes

At the end of the course, the student should be able to:

1. describe theories of hospital finance and budgeting at the federal, state and local government levels;
2. develop a realistic budget for the hospital; and
3. implement budget effectively and efficiently.

Course Contents

Hospital finance and budgeting. Its definition, content, conceptual clarifications, theories and the essence of hospital finance and budgeting at the federal, state and local government levels. Sources of management of hospital finances. Socio-political and welfare aspects of budgeting are equally significant and relevant. The study of modern hospital management economic strategies



as tools for development in the health sector. Emphasis on privatization for effective and efficient management of the country's health care resources.

HAM 317: Patient Rights and Health Care Practice

(2 Units C: LH 30)

Learning Outcomes

At the end of the course, the student should be able to:

1. identify all statutes relating to patient rights;
2. discuss patient rights and responsibilities in health care; and
3. analyse actions of relevant stakeholders on existing legal regime in relation to patient rights.

Course Contents

Protection of patient rights and challenges in the African context. Context of democratization and the globalisation of the patient rights regime. Comprehension and analysis of the actions of states, international organisations, non-governmental organisation, communities and individuals in relation to the existing legal regime in relation to patient rights.

HAM 321: Healthcare Management Practicum (SIWES)

(6 Units C: PH 270)

Learning Outcomes

At the end of the course, the student should be able to:

1. demonstrate acquired knowledge and skills in relevant healthcare settings; and
2. function as a healthcare and hospital administrator/manager.

Course Contents

Mandatory 6 months uninterrupted SIWES training at the 300-level second semester. Work experience in public or private institutions and organisations relevant to the programme and or job market such as hospitals, nursing homes, ambulatory care facilities, physician practices, insurance organisations, health-related research and development firms, pharmaceutical and medical equipment companies.

HAM 411: Labour Economics

(2 Units C: LH 30)

Learning Outcomes

At the end of the course, the student should be able to:

1. discuss dynamics of the markets for wage labour; and
2. discuss wage negotiation between labour hospital workers and management.

Course Contents

What is labour? Labour as a commodity. Labour force definition and concepts. Labour market theories. Determinations of sizes and composition of labour force. Distribution of labour force. Functioning and dynamics of the markets for wage labour. Labour markets or job markets function through the interaction of workers and employers. Suppliers of labour services (workers) and the demanders of labour services (employers). Resultant pattern of wages, employment, and income. Nature of labour problems in developing countries. The informal sector and the modern sector. Economics of wage determination. Features of Nigerian labour market, manpower development.

HAM 412: Industrial Psychology

(2 Units C: LH 30)



Learning Outcomes

At the end of the course, the student should be able to:

1. describe the principles of industrial psychology;
2. discuss the challenges of personnel management; and
3. propose solutions to the challenges of personnel management.

Course Contents

Industrial psychology. Principle, practices and problems. African perspective. Nature of work and organisations in Africa. Major deterrent factors. Psychological research in organisation. Personnel selection, Personnel testing in organisations and performance appraisal. Training in industrial organisation. Problems of personnel training. Managerial psychology. Leadership and supervision in organisations. Motivation morale, job satisfaction and incentives. Organisational psychology. Working condition in organisations. Engineering psychology. Human errors, fatigue, accidents and safety. Consumer psychology. Organisational effectiveness.

HAM 413: Leadership Skills

(2 Units C: LH 30)

Learning Outcomes

At the end of the course, the student should be able to:

1. discuss leadership concepts;
2. identify skills necessary for leadership;
3. integrate leadership skills; and
4. demonstrate effective leadership approaches in practice.

Course Contents

Transformation as a fundamental shift in the deep orientation of a person, organisation or society such that the world is seen in new ways and new actions and results that were impossible prior to the transformation become possible. Transformation at the individual level and its personal embodiment for sustainability as collective practices and norms. Leadership Development Programme (LDP) and novel approaches to teaching and learning, with emphasis on practical involvement of participants. Interactive, exercises and actual implementation of breakthrough projects by teams that make difference in the lives of the target population. Leadership concepts comprising of listening, conversation, emotional intelligence, breakthrough initiatives, gender and leadership, coaching and leadership, enrolment conversation and forming and leading teams.



HAM 401: Research Methodology

(2 Units C: LH 30)

Learning Outcomes

At the end of the course, students should be able to:

1. identify research problems;
2. describe what literature search and review entail;
3. describe different research designs and sampling methods; and
4. describe the process of investigating a research problem.

Course Contents

Rudiments of research methodology and its application to the public health field. The course covers a basic learning of the following aspects: research problem definition, research questions, research and null hypothesis theoretical-conceptual formulation of research problems. Review of related literature, basic research designs. Methods of research observations, measurement of variables, data analytic techniques, interpretation of research findings. Includes study of randomisation techniques, epidemiologic research designs and controlled clinical trials.

HAM 414: Health Care, Hospital Ethics and Administrative Law (2 Units C: LH 30)

Learning Outcomes

At the end of the course, the student should be able to:

1. explain the concept of hospital ethics and administrative law;
2. discuss ethics of healthcare and hospital practices; and
3. discuss laws guiding healthcare and hospital practices.

Course Contents

Reflection of integration of morals and conduct in health care transactions. Hospital based welfare economics. The practice of trading and bartering. Integrity in business. Fraud and dishonesty. Borrowing and lending regulations. Honest payment of wages at the close of each day. Special provision for poor and strangers. Regulations for pledges or mortgages of personal property. Modern illustrations of Man's quest for wealth and its implication on integrity of leaders. Moral and ethical values of business transactions in the hospital, as guided by ethical principles (such as principles of equity, to whom much is given, much is expected). Law. Its definition, content and theories. Essence of justice, morality in law and the totality of laws that are connected with hospital management affairs.

HAM 499 Project

(6 Units C: PH 270)

Learning Outcomes

At the end of the course, the student should be able to:

1. identify a problem to be solved;
2. develop a study protocol;
3. conduct a study (collect, analyse and interpret study findings); and
4. write and communicate the study report.



Course Contents

Student will design, execute high quality project and submit a report. Investigating a research problem. Research design and planning execution of the research design. Data collection and storage. Analysis and interpretation of the obtained data. Student reports independent research findings as a dissertation which is examined with external moderation.

Minimum Academic Standards

Staffing

1. Academic staff

Minimum of six (6) in the following categories:

| | | |
|------------------------------|---|---|
| Professor/Reader | - | 1 |
| Senior lecturer | - | 2 |
| Lecturers Grade I and below | - | 3 |
| Staff-Student ratio is 1:15. | | |

2. Senior administrative staff

| | | |
|-------------------|---|---|
| Executive Officer | - | 1 |
| Secretary | - | 1 |

3. Junior Staff

| | | |
|----------------|---|---|
| Clerical staff | - | 2 |
|----------------|---|---|

Library Resources

Textbooks (Printed and Electronic)

Journals (Printed and Electronic)

Hospital Bulletins

Internet network

Classrooms, Laboratories and Office Space

Classroom

The standard requirement of 0.65m^2 per full-time student should be maintained. Thus the minimum total space requirement for a faculty or department shall be the product of its total full time equivalent student enrolment (FTE) and the minimum space requirement per full-time equivalent i.e. (FTE) 0.65m^2 .

Office

In this respect, each academic staff should have an office space of at least 25 square metres taking into cognisance the status/cadre of the staff

In addition, there should be for the Faculty, a Dean's office and for each Department a Head of Department's office with attached offices for their supporting staff as specified below in m^2 :

| | | |
|----------------------------------|---|-------|
| Professor's office | - | 18.50 |
| Head of Department's office | - | 18.50 |
| Tutorial teaching staff's office | - | 13.50 |
| Other teaching staff space | - | 7.00 |
| Technical staff space | - | 7.00 |
| Secretarial space | - | 7.00 |
| Staff research laboratory | - | 16.50 |
| Seminar Space/per student | - | 1.85 |
| Laboratory space (per student) | - | 7.50 |



B.HIM. Health Information Management

Overview

The Health sector in Nigeria is a fast growing sub-sector of the social services. Health and medical personnel need accurate, reliable, complete and timely information for planning, decision-making and controlling. The new programme B.HIM is tailored to achieve this and offer some fundamental skills, knowledge and experiences that must be covered in order for a degree to be successfully accredited by the profession and for graduates to be credible employees in the eyes of potential employers. This programme is designed to meet students' strengths and interests while giving the best learning experiences to inform specialization desires. The diversity of interdisciplinary courses ultimately equip students to know, understand and acquire the requisite skills to address the interconnected challenges of global environmental and climate change. The programme is expected to build up a broad knowledge of subject and assist the student to get first experiences of practical work. After regular study duration of ten semesters the students are graduated with the degree Bachelor of Health Information Management (B.HIM). The overview explains the pertinence of producing thoroughly bred and well informed Health Information Management Practitioners compatible with what is obtainable in the developed world through acquisition of University education, training and development.

Philosophy

The philosophy of the Bachelor of Health Information Management is to provide sound academic and professional training for prospective Health Information Management Officers who will work in public, private and non-governmental health and medical establishments. The programme was borne out of the realisation that there is a need to expand Health Information Management Programme to cover the training of high level manpower needed in Health sector at both National, Regional and International markets. The programme is important in order to give academic training to prospective applicants and members of the existing teaching staff at the various health information management departments in Nigeria and those that may be willing to teach in Schools of Health Information Management throughout the federation.

Objectives

The Bachelor Degree Programme in Health Information Management (B.HIM) is designed to foster the development of professional Health Information Management practice in Nigeria, and to provide candidates with high level of intellectual and professional skills that will enable them function effectively in the society. Specifically, the programme is intended to:

1. provide prospective Health Information Management Officers with the intellectual and professional background adequate for their assignments and to make them adaptable to any changing situations within the health care industry;
2. provide high skilled manpower for leadership positions in Nigerian Health Industry;
3. produce highly qualified and motivated personnel for the Information management industry;
4. expose the students to variety of Health Information and health problems and to encourage them develop spirit of understanding and control; and
5. produce highly creative and innovative Health Information Management personnel for self-employment in Nigeria and elsewhere.



Unique Features of the Programme

The unique feature of the Health Information Management Programme from other Allied Health Science Programmes is that, it is the pivot on which other programmes rotate for relevance, effective functioning and survival. This is based on obvious facts that all Allied Health Sciences Programmes require relevant data and information for effective job performance, patient's care, research, education and training which can only be sourced through health information management practices.

B.HIM will enable the graduate to effectively deal with the organisation and management of patient data stored manually and electronically. HIM professionals will be able to code health information for proper distribution or research and to ensure their organisation complies with governmental regulations pertaining to patient data. They will be able to ensure that patient health records are complete, accurate and that they provide access to records to those appropriate while protecting the privacy and security of patient health information. They are expected after their training to have gathered enough experience with medical records management, coding and billing, and regulatory requirements. HIM involves the management of personal health information in healthcare organisations, hospitals, and public health programs to enable the delivery of services to the public. Some of the types of data that a Health Information Management Officer or professional may work with include patient histories from physical exams, clinical information from physical therapy and nursing notes, and records of X-rays and other radiological procedures.

Employability Skills

The skills required is to acquire and offer basic theoretical knowledge for effective performance of professional duties in Health Information Management thereby providing relevant practical exposure and competence necessary for enhanced job performance. B.HIM as a Degree course is new in Nigeria and highly relevant to the demands in the 36 states of the federation. With the possible release of relevant BMAS by NUC, the numerous trained personnel in HIM at Diploma, ND and HND can have the opportunity of attaining a higher qualification that is required for their promotion in the private and public service in Nigeria.

21st Century Skills

1. Collaboration and team work
2. Creativity and imagination
3. Critical thinking
4. Problem solving
5. Flexibility and adaptability
6. Information Literacy
7. Leadership
8. Civic literacy and citizenship
9. Social responsibility
10. Technology literacy
11. Initiative



Admission and Graduation Requirements

Five-Year Degree Programme

Candidates are expected to have credit passes in the Senior Secondary Certificate (SSC) or its equivalent in five subjects (Mathematics, English, Biology, Physics and Chemistry) at not more than two sittings in addition to acceptable pass in the Unified Tertiary Matriculation Examination (UTME).

Direct Entry (3 & 4 year degree programme)

Any one of the following qualifications is admissible for either of these options:

In addition to SSC requirements stipulated above, applicants should possess at least two A'Level papers in relevant subjects.

Three Year Direct Entry:

Candidates are to be admitted to the 300 level and are expected to have completed their HND in Health Information Management and must have participated in the compulsory one year NYSC programme. This programme is also called top-up in some universities in Nigeria

Four-Year Direct Entry:

Candidates are to be admitted to the 200 level and must have completed professional diploma or National Diploma (ND) in Health Information Management at the Colleges of Health Science and Technology in Nigeria or its equivalent. In addition, candidates are expected to have the same entry requirements of credit in five (5) subjects (Mathematics, English, Biology, Physics and chemistry) at no more than two sittings.

Graduation Requirements

1. To qualify for award of Bachelor Degree in Health Information Management, candidates must pass a minimum of 150 credit units for University Matriculation Examination Candidates or 120 and 100 credit units for the ND and HND direct entry candidates respectively.
2. All compulsory and required courses must be passed with a minimum of 45%.



Global Course Structure

100 Level

| Course Code | Course Title | Unit(s) | Status | LH | PH |
|-------------|------------------------------|-----------|--------|----|----|
| GST 111 | Communication in English | 2 | C | 15 | 45 |
| GST 112 | Nigerian Peoples & Culture | 2 | C | 30 | - |
| BIO 101 | General Biology 1 | 2 | C | 30 | - |
| BIO 121 | General Biology II | 2 | C | 30 | - |
| BIO 111 | General Biology Practical I | 1 | C | - | 45 |
| BIO 122 | General Biology Practical II | 1 | C | - | 45 |
| CHM 101 | General Chemistry I | 2 | C | 30 | - |
| CHM 121 | General Chemistry II | 2 | C | 30 | - |
| CHM 111 | Practical Chemistry I | 1 | C | - | 45 |
| CHM 122 | Practical Chemistry II | 1 | C | - | 45 |
| PHY 101 | General Physics I | 2 | C | 30 | - |
| PHY 121 | General physics II | 2 | C | 30 | - |
| PHY 111 | General Practical Physics I | 1 | C | - | 45 |
| PHY 122 | General Practical Physics II | 1 | C | - | 45 |
| STA 111 | Basic Statistics | 2 | C | 30 | - |
| | Total Units | 24 | | | - |

200 Level

| Course Code | Course Title | Unit(s) | Status | LH | PH |
|-------------|--|-----------|--------|----|----|
| GST 212 | Philosophy, Logic and Human Existence | 2 | C | 30 | - |
| ENT 211 | Entrepreneurship and Innovation | 2 | C | 30 | - |
| HIM 211 | Introduction To Health Information Science | 2 | C | 30 | - |
| HIM 212 | Health Records Management I | 2 | C | 30 | - |
| CHS 212 | Introduction to Public Health & Primary health Care | 2 | C | 30 | - |
| ANA 201 | Anatomy of Upper and Lower Limbs | 2 | C | 15 | 45 |
| HIM 221 | Introduction to Information Technology and Organisational Information Security | 2 | C | 30 | - |
| HIM 222 | Knowledge Management In Health Information System | 2 | C | 30 | - |
| HIM 223 | Statistical Methods In Health Information Management I | 2 | C | 30 | - |
| HIM 224 | Disease Classification, Clinical Coding, Indexing and Abstracting. | 2 | C | 15 | 45 |
| CHS 221 | Principles of Epidemiology and Disease Surveillance | 2 | C | 30 | - |
| | Total Units | 23 | | | |



300 Level

| Course Code | Course Title | Unit(s) | Status | LH | PH |
|--------------------|---|----------------|---------------|-----------|-----------|
| GST 312 | Peace and Conflict Resolution | 2 | C | 30 | - |
| ENT 312 | Venture Creation | 2 | C | 15 | 45 |
| HIM 311 | Hospital Official Statistics | 2 | C | 30 | - |
| HIM 312 | Policy, Legal and ethics aspect of HIM | 2 | C | 30 | - |
| HIM 313 | Database Construction And Management in Health Information System | 2 | C | 15 | 45 |
| HIM 314 | Statistical Methods in Health Information Management II | 2 | C | 30 | - |
| HIM 315 | Health Records Management II | 2 | C | 30 | - |
| PHA 311 | Introduction to Pharmacology I | 2 | C | 30 | - |
| HIM 321 | Health Care Financing Insurance Principles And Programmes | 2 | C | 30 | - |
| HIM 322 | Fundamental of Medical Practice | 2 | C | 30 | - |
| HIM 323 | Software Application to Health Information Management | 2 | C | 15 | 45 |
| COM 315 | Biostatistics | 2 | C | 30 | - |
| | Total Units | 24 | | | |

400 Level

| Course Code | Course Title | Unit(s) | Status | LH | PH |
|--------------------|--|----------------|---------------|-----------|-----------|
| HIM 411 | Computer Application In Health Information System | 2 | C | 30 | - |
| HIM 412 | Principles Of Information Retrieval System | 2 | C | 30 | - |
| HIM 413 | Principles Of Management In Health Care System II | 2 | C | 30 | - |
| HIM 414 | Research Methods and Proposal writing in Health Information Management | 2 | C | 30 | - |
| CHS 422 | Demography and Social Statistics in Public Health | 2 | C | 30 | - |
| HIM 460 | Industrial Training in Medical and Health institutions | 4 | C | - | 180 |
| | Total Units | 14 | | | - |



500 Level

| Course Code | Course Title | Unit(s) | Status | LH | PH |
|-------------|--|-----------|--------|----|-----|
| HIM 511 | Data Communications And telecommunications Networking and Structures | 2 | C | 30 | - |
| HIM 512 | Health Information System Analysis and Design | 2 | C | 30 | - |
| HIM 513 | Public Relations In Health Information System | 2 | C | 30 | - |
| HIM 514 | Health Records Management III | 2 | C | 30 | - |
| CHS 512 | Psychology of Development, Health Behaviour & Change Process | 2 | C | 30 | - |
| HIM 521 | Economics And Marketing of Health Information | 2 | C | 30 | - |
| HIM 522 - | Preservation, Conservation and Disaster Management in Health Records | 2 | C | 30 | - |
| HIM 523 | Hospital Management, Interdepartmental Structure and Organogram | 2 | C | 30 | - |
| HIM 524 | Research Project | 4 | C | - | 180 |
| | TOTAL | 20 | | | |

Course Contents and Learning Outcomes

100 Level

GST 111: Communication in English

(2 Unit C: LH 15; PH 45)

Learning Outcomes

At the end of this course, students should be able to:

1. identify possible sound patterns in English Language;
2. list notable Language skills;
3. classify word formation processes;
4. construct simple and fairly complex sentences in English;
5. apply logical and critical reasoning skills for meaningful presentations;
6. demonstrate an appreciable level of the art of public speaking and listening; and
7. write simple and technical reports.

Course Contents

Sound patterns in English Language (vowels and consonants, phonetics and phonology). English word classes (lexical and grammatical words, definitions, forms, functions, usages, collocations). Sentence in English (types: structural and functional, simple and complex). Grammar and Usage (tense, mood, modality and concord, aspects of language use in everyday life). Logical and Critical Thinking and Reasoning Methods (Logic and Syllogism, Inductive and Deductive Argument and Reasoning Methods, Analogy, Generalisation and Explanations). Ethical considerations, Copyright Rules and Infringements. Writing Activities: (Pre-writing , Writing, Post writing, Editing



and Proofreading; Brainstorming, outlining, Paragraphing, Types of writing, Summary, Essays, Letter, Curriculum Vitae, Report writing, Note making and many others. Mechanics of writing). Comprehension Strategies: (Reading and types of Reading, Comprehension Skills, 3RsQ). Information and Communication Technology in modern Language Learning. Language skills for effective communication. Major word formation processes. Writing and reading comprehension strategies. Logical and critical reasoning for meaningful presentations. Art of public speaking and listening.

GST 112: Nigerian Peoples and Culture

(2 Units C: LH:30)

Learning Outcomes

At the end of the course, students should be able to:

1. analyse the historical foundation of the Nigerian culture and arts in pre-colonial times;
2. list and identify the major linguistic groups in Nigeria;
3. explain the gradual evolution of Nigeria as a political unit;
4. analyse the concepts of Trade, Economic and Self-reliance status of the Nigerian peoples towards national development;
5. enumerate the challenges of the Nigerian State towards Nation building;
6. analyse the role of the Judiciary in upholding people's fundamental rights;
7. identify acceptable norms and values of the major ethnic groups in Nigeria; and
8. list and suggest possible solutions to identifiable Nigerian environmental, moral and value problems.

Course Contents

Nigerian history, culture and art up to 1800 (Yoruba, Hausa and Igbo peoples and culture; peoples and culture of the ethnic minority groups). Nigeria under colonial rule (advent of colonial rule in Nigeria; Colonial administration of Nigeria). Evolution of Nigeria as a political unit (amalgamation of Nigeria in 1914; formation of political parties in Nigeria; Nationalist movement and struggle for independence). Nigeria and challenges of nation building (military intervention in Nigerian politics; Nigerian Civil War). Concept of trade and economics of self-reliance (indigenous trade and market system; indigenous apprenticeship system among Nigeria people; trade, skill acquisition and self-reliance). Social justices and national development (law definition and classification. Judiciary and fundamental rights. Individual, norms and values (basic Nigeria norms and values, patterns of citizenship acquisition; citizenship and civic responsibilities; indigenous languages, usage and development; negative attitudes and conducts. Cultism, kidnapping and other related social vices). Re-orientation, moral and national values (The 3R's – Reconstruction, Rehabilitation and Re-orientation; Re-orientation Strategies: Operation Feed the Nation (OFN), Green Revolution, Austerity Measures, War Against Indiscipline (WAI), War Against Indiscipline and Corruption(WAIC), Mass Mobilization for Self-Reliance, Social Justice and Economic Recovery (MAMSER), National Orientation Agency (NOA). Current socio-political and cultural developments in Nigeria.



BIO 101: General Biology I**(2 Units C: LH 30)****Learning Outcomes**

At the end of lectures in Plant Biology, students should be able to:

1. explain cell structure and organisations;
2. summarise functions of cellular organelles;
3. characterise living organisms and state their general reproduction;
4. describe the interrelationship that exists between organisms;
5. discuss the concept of heredity and evolution; and
6. enumerate habitat types and their characteristics.

Course Contents

Cell structure and organisation. Functions of cellular organelles. Characteristics and classification of living things. Chromosomes, genes their relationships and importance. General reproduction. Interrelationships of organisms (competitions, parasitism, predation, symbiosis, commensalisms, mutualism, saprophytism); heredity and evolution (introduction to Darwinism and Lamarkism. Mendelian laws. Explanation of key genetic terms), elements of ecology and types of habitats.

BIO 102: General Biology II**(2 Units C: LH 30)****Learning Outcomes**

At the end of the lectures in Introductory Ecology, students should be able to:

1. list the characteristics, methods of identification and classification of viruses, bacteria and fungi;
2. state the unique characteristics of plant and animal kingdoms;
3. describe ecological adaptations in the plant and animal kingdom;
4. give a summary of the physiology of plants and animals;
5. explain nutrition, respiration, excretion and reproduction in plants and animals; and
6. describe growth and development in plants and animals.

Course Contents

Basic characteristics, identification and classification of viruses, bacteria and fungi. A generalised survey of the plant and animal kingdoms based mainly on the study of similarities and differences in the external features. Ecological adaptations. Briefs on physiology to include nutrition, respiration, circulatory systems, excretion, reproduction, growth and development.

BIO 107: General Biology Practical I**(1 Unit C: PH 45)****Learning Outcomes**

At the end of the course, students should be able to:

1. outline common laboratory hazards;
2. provide precautions on laboratory hazards;
3. state the functions of the different parts of microscope;
4. use the microscope and describe its maintenance;
5. draw biological diagrams and illustrations; and
6. apply scaling and proportion to biological diagrams.

Course Contents

Common laboratory hazards: prevention and first aid; measurements in biology; uses and care of microscope: compound and dissecting microscope. Biological drawings and illustration, scaling, accuracy and proportion; use of common laboratory apparatus and laboratory experiments designed to illustrate the topics covered in BIO 101.

BIO 108: General Biology Practical II

(1 Unit C: LH 45)

Learning Outcomes

At the end of the course, students should be able to:

1. describe the anatomy of flowering plants;
2. differentiate types of fruit and seeds;
3. state ways of handling and caring for biological wares;
4. describe the basic histology of animal tissues; and
5. identify various groups in the animal kingdom.

Course Contents

Anatomy of flowering plants, primary vegetative body: stem, leaf and root to show the mature tissues namely parenchyma, collenchyma, sclerenchyma, xylem and phloem. Types of fruits and seeds. Care and use of dissecting kits and other biological wares. Dissection and general histology of animal tissues based on vertebrate forms. Morphology and functions of epithelial, muscular, nervous and connective tissues. Examination of various groups of lower invertebrates under microscopes, identification of various groups of organisms in Animal Kingdom. And any experiment designed to emphasise the practical aspects of topics in BIO 102

CHM 101: General Chemistry I

(2 Units C: LH 30)

Learning Outcomes

At the end of this course, the students should be able to:

1. define atom, molecules and chemical reactions;
2. discuss the modern electronic theory of atoms;
3. write electronic configurations of elements on the periodic table;
4. rationalise the trends of atomic radii, ionization energies, electronegativity of the elements based on their position in the periodic table;
5. identify and balance oxidation – reduction equation and solve redox titration problems;
6. draw shapes of simple molecules and hybridised orbitals;
7. identify the characteristics of acids, bases and salts, and solve problems based on their quantitative relationship;
8. apply the principles of equilibrium to aqueous systems using le chatelier's principle to predict the effect of concentration, pressure and temperature changes on equilibrium mixtures;
9. analyse and perform calculations with the thermodynamic functions, enthalpy, entropy and free energy; and
10. determine rates of reactions and its dependence on concentration, time and temperature.



Course Contents

Atoms, molecules, elements and compounds and chemical reactions. Modern electronic theory of atoms. Electronic configuration, periodicity and building up of the periodic table. Hybridisation and shapes of simple molecules. Valence Forces; Structure of solids. Chemical equations and stoichiometry; Chemical bonding and intermolecular forces, kinetic theory of matter. Elementary thermochemistry; rates of reaction, equilibrium and thermodynamics. Acids, bases and salts. Properties of gases. Redox reactions and introduction to electrochemistry. Radioactivity.

CHM 102: General Chemistry II

(2 Units C: LH 30)

Learning Outcomes

At the end of this course, the students should be able to:

1. state the importance and development of organic chemistry;
2. define fullerenes and its applications;
3. discuss electronic theory;
4. determine the qualitative and quantitative of structures in organic chemistry;
5. state rules guiding nomenclature and functional group classes of organic chemistry;
6. determine rate of reaction to predict mechanisms of reaction;
7. identify classes of organic functional group with brief description of their chemistry;
8. discuss comparative chemistry of group 1a, iia and iva elements; and
9. describe basic properties of transition metals.

Course Contents

Historical survey of the development and importance of Organic Chemistry; Fullerenes as fourth allotrope of carbon. uses as nanotubules. nanostructures. nanochemistry. Electronic theory in organic chemistry. Isolation and purification of organic compounds. Determination of structures of organic compounds including qualitative and quantitative analysis in organic chemistry. Nomenclature and functional group classes of organic compounds. Introductory reaction mechanism and kinetics. Stereochemistry. The chemistry of alkanes, alkenes, alkynes, alcohols, ethers, amines, alkyl halides, nitriles. Aldehydes, ketones, carboxylic acids and derivatives. The Chemistry of selected metals and non-metals. Comparative chemistry of group IA, IIA and IVA elements. Introduction to transition metal chemistry.

CHM 107: General Chemistry Practical I

(1 Unit C: PH 45)

Learning Outcomes

At the end of this course, the students should be able to:

1. state the general laboratory rules and safety procedures;
2. collect scientific data and correctly carrying out chemical experiments;
3. identify the basic glassware and equipment in the laboratory;
4. identify the differences between primary and secondary standards;
5. perform redox titration;
6. recording observations and measurements in the laboratory notebooks; and
7. analyse the data to arrive at scientific conclusions.



Course Contents

Laboratory experiments designed to reflect topics presented in courses CHM 101 and CHM 102. These include acid-base titrations. qualitative analysis. redox reactions. gravimetric analysis. data analysis and presentation.

CHM 108: General Chemistry Practical II**(1 Unit C: PH 45)****Learning Outcomes**

At the end of this course, the students should be able to:

1. identify the general laboratory rules and safety procedures;
2. collect scientific data and correctly carrying out chemical experiments;
3. identify the basic glassware and equipment in the laboratory;
4. identify and carry out preliminary tests which includes ignition, boiling point, melting point, test on known and unknown organic compounds;
5. perform solubility tests on known and unknown organic compounds;
6. conduct elemental tests on known and unknown compounds; and
7. conduct functional group/confirmatory test on known and unknown compounds which could be acidic / basic / neutral organic compounds.

Course Contents

Continuation of CHM 107. Additional laboratory experiments to include functional group analysis, quantitative analysis using volumetric methods.

MTH 101: Elementary Mathematics I (Algebra and Trigonometry) (2 Units C: LH 30)**Learning Outcomes**

At the end of this course students should be able to:

1. explain basic definition of Set, Subset, Union, Intersection, Complements and use of Venn diagrams;
2. solve quadratic equations;
3. Solve trigonometric functions;
4. identify various types of numbers; and
5. solve some problems using Binomial theorem.

Course Contents

Elementary set theory, subsets, union, intersection, complements, venn diagrams. Real numbers, integers, rational and irrational numbers. Mathematical induction, real sequences and series. Theory of quadratic equations. Binomial theorem. Complex numbers. Algebra of complex numbers. The Argand diagram. De-Moivre's theorem, nth roots of unity. Circular measure, trigonometric functions of angles of any magnitude, addition and factor formulae.



PHY 101: General Physics I (Mechanics)

(2 Units C: LH 30)

Learning Outcomes

At the end of this course, the students should be able to:

1. identify and deduce the physical quantities and their units;
2. differentiate between vectors and scalars;
3. describe and evaluate motion of systems on the basis of the fundamental laws of mechanics;
4. apply Newton's laws to describe and solve simple problems of motion;
5. evaluate work, energy, velocity, momentum, acceleration, and torque of moving or rotating objects;
6. explain and apply the principles of conservation of energy, linear and angular momentum;
7. describe the laws governing motion under gravity; and
8. explain motion under gravity and quantitatively determine behaviour of objects moving under gravity.

Course Contents

Space and time. units and dimension. Vectors and Scalars. Differentiation of vectors: displacement. velocity and acceleration. kinematics. Newton laws of motion (Inertial frames. Impulse. force and action at a distance. momentum conservation). Relative motion. Application of Newtonian mechanics. Equations of motion. Conservation principles in physics. Conservative forces. Conservation of linear momentum. Kinetic energy and work. Potential energy. System of particles. Centre of mass. Rotational motion. Torque. vector product. Moment. Rotation of coordinate axes and angular momentum. Polar coordinates. conservation of angular momentum. Circular motion. Moments of inertia. gyroscopes and precession. Gravitation: Newton's Law of Gravitation. Kepler's Laws of Planetary Motion. Gravitational Potential Energy. Escape velocity. Satellites motion and orbits.

PHY 102: General Physics II (Electricity & Magnetism)

(2 Units C: LH 30)

Learning Outcomes

At the end of this course, the students should be able to:

1. describe the electric field and potential, and related concepts, for stationary charges;
2. calculate electrostatic properties of simple charge distributions using Coulomb's law, Gauss's law and electric potential;
3. describe and determine the magnetic field for steady and moving charges;
4. determine the magnetic properties of simple current distributions using Biot-Savart and Ampere's law;
5. describe electromagnetic induction and related concepts, and make calculations using Faraday and Lenz's laws;
6. explain the basic physical of Maxwell's equations in integral form;
7. evaluate DC circuits to determine the electrical parameters; and
8. determine the characteristics of ac voltages and currents in resistors, capacitors, and inductors



Course Contents

Forces in nature. Electrostatics; electric charge and its properties, methods of charging. Coulomb's law and superposition. electric field and potential. Gauss's law. Capacitance. Electric dipoles. Energy in electric fields. Conductors and insulators, current, voltage and resistance. Ohm's law and analysis of DC circuits. Magnetic fields. Lorentz force. Biot-Savart and Ampère's laws. magnetic dipoles. Dielectrics. Energy in magnetic fields. Electromotive force. Electromagnetic induction. Self and mutual inductances. Faraday and Lenz's laws. Step up and step-down transformers: Maxwell's equations. Electromagnetic oscillations and waves. AC voltages and currents applied to inductors, capacitors, resistance, and combinations.

PHY 107: General Practical Physics I

(1 Unit C: PH 90)

Learning Outcomes

At the end of this course, the students should be able to:

1. conduct measurements of some physical quantities;
2. make observations of events, collect and tabulate data;
3. identify and evaluate some common experimental errors;
4. plot and analyse graphs; and
5. draw conclusions from numerical and graphical analysis of data.

Course Contents

These introductory courses emphasise quantitative measurements. the treatment of measurement errors. and graphical analysis. A variety of experimental techniques should be employed. The experiments include studies of meters. the oscilloscope. mechanical systems. electrical and mechanical resonant systems. Light, Heat, viscosity and many others. covered in PHY 101 and PHY 102. However. emphasis should be placed on the basic physical techniques for observation. measurements. data collection. analysis and deduction.

PHY 108: General Practical Physics II

(1 Unit C: PH 45)

Learning Outcomes

At the end of this course, the student should be able to:

1. conduct measurements of some physical quantities;
2. make observations of events, collect and tabulate data;
3. identify and evaluate some common experimental errors;
4. plot and analyse graphs;
5. draw conclusions from numerical and graphical analysis of data; and
6. prepare and present practical reports.

Course Contents

This practical course is a continuation of PHY 107 and is intended to be taught during the second semester of the 100 level to cover the practical aspect of the theoretical courses that have been covered with emphasis on quantitative measurements. The treatment of measurement errors, and graphical analysis. However, emphasis should be placed on the basic physical techniques for observation, measurements, data collection, analysis and deduction.



STA 111: Basic Statistics**(2 Units C: LH 30)****Learning Outcomes**

At the end of the courses, the students should be able to:

1. explain the basic concepts of descriptive statistics;
2. present data in graphs and charts;
3. differentiate between measures of location, dispersion and partition;
4. describe the basic concepts of skewness and kurtosis as well as their utility function in a given data set;
5. differentiate rates from ratio and how they are use;
6. compute the different types of index number from a given data set and interpret the output;
7. explain the differences between permutation and combination;
8. explain the concept of random variables and relate it to probability and distribution functions;
9. describe the basic distribution functions; and
10. explain the concept exploratory data analysis.

Course Contents

Statistical data: types, sources and methods of collection. Presentation of data: tables, chart and graphs. Errors and approximations. Frequency and cumulative distributions, measures of location, partition, dispersion, skewness and kurtosis. Rates, ratios and index numbers. Permutation and combination. Concepts and principles of probability, random variables, probability and distribution functions. Basic distributions: Binomial, geometric, Poisson, normal and sampling distributions and exploratory data analysis.

200 Level**GST 212: Philosophy, Logic and Human Existence****(2 Units C: LH 30)****Learning Outcomes**

A student who has successfully gone through this course should be able to:

1. describe the basic features of philosophy as an academic discipline;
2. identify the main branches of philosophy & the centrality of logic in philosophical discourse;
3. state the elementary rules of reasoning;
4. distinguish between valid and invalid arguments;
5. think critically and assess arguments in texts, conversations and day-to-day discussions;
6. critically asses the rationality or otherwise of human conduct under different existential conditions;
7. develop the capacity to extrapolate and deploy expertise in logic to other areas of knowledge; and
8. guide his or her actions, using the knowledge and expertise acquired in philosophy and logic.



Course Contents

Scope of philosophy; notions, meanings, branches and problems of philosophy. Logic as an indispensable tool of philosophy. Elements of syllogism, symbolic logic— the first nine rules of inference. Informal fallacies, laws of thought, nature of arguments. Valid and invalid arguments, logic of form and logic of content — deduction, induction and inferences. Creative and critical thinking. Impact of philosophy on human existence. Philosophy and politics, philosophy and human conduct, philosophy and religion, philosophy and human values, philosophy and character molding, and many others.

ENT 211: Entrepreneurship and Innovation

(2 Units C: LH 30)

Learning Outcomes

At the end of this course, students should be able to:

1. explain the concepts and theories of entrepreneurship, intrapreneurship, opportunity seeking, new value creation, and risk taking;
2. state the characteristics of an entrepreneur;
3. analyse the importance of micro and small businesses in wealth creation, employment, and financial independence;
4. engage in entrepreneurial thinking;
5. identify key elements in innovation;
6. describe stages in enterprise formation, partnership and networking including business planning;
7. describe contemporary entrepreneurial issues in Nigeria, Africa and the rest of the world; and
8. state the basic principles of e-commerce.

Coursed Contents:

Concept of Entrepreneurship (Entrepreneurship, Intrapreneurship/Corporate Entrepreneurship,). Theories, Rationale and relevance of Entrepreneurship (Schumpeterian and other perspectives, Risk-Taking, Necessity and opportunity-based entrepreneurship and Creative destruction). Characteristics of Entrepreneurs (Opportunity seeker, Risk taker, Natural and Nurtured, Problem solver and change agent, Innovator and creative thinker). Entrepreneurial thinking (Critical thinking, Reflective thinking, and Creative thinking). Innovation (Concept of innovation, Dimensions of innovation, Change and innovation, Knowledge and innovation). Enterprise formation, partnership and networking (Basics of Business Plan, Forms of business ownership, Business registration and Forming alliances and join ventures). Contemporary Entrepreneurship Issues (Knowledge, Skills and Technology, Intellectual property, Virtual office, Networking). Entrepreneurship in Nigeria (Biography of inspirational Entrepreneurs, Youth and women entrepreneurship, Entrepreneurship support institutions, Youth enterprise networks and Environmental and cultural barriers to entrepreneurship). Basic principles of e-commerce.



ANA 201: Anatomy of Upper & Lower Limbs

(2 Units C: LH 15; PH 45)

Learning Outcomes

At the end of the course, students should be able to:

1. define fundamental anatomical terminology and discuss the anatomical position;
2. describe the anatomy of the musculoskeletal system, including the axial skeleton; appendicular skeleton, appendicular and axial muscles, and arthrology;
3. describe the general features of the bones of the upper and lower limbs;
4. identify the major muscles of the upper and lower limbs;
5. explain the types and structure of the joints of the upper and lower limbs;
6. correlate between the attachment of the muscles and their functions on the different joints;
7. identify the major nerves of the upper and lower limbs;
8. describe the functional components of each of the major nerves and its distribution;
9. identify and describe the course of the major superficial veins of the upper and lower limbs; and
10. name the major arteries of the upper and lower limbs.

Course Contents

Descriptive terms, planes and terms of relationship of the human body, terms of comparison, attachment of muscles, types of muscles, movements of joints. Osteology, Principles of Kinesiology, general organisation of body systems. Cutaneous innervations of upper limb. Pectoral region. Breast. Axilla. Shoulder region. Arm and cubital fossa. Flexor Compartment of forearm. Extensor compartment of forearm. Hand. Venous and lymphatic drainage of the upper limb. Applied anatomy of nerves. Blood supply of the upper limb. Cutaneous innervation of lower limb. Femoral triangle. Adductor canal and medial side of the thigh. Gluteal region. Back of the thigh, popliteal fossa. Extensor compartment of the leg and dorsum of the foot. Peroneal and flexor compartment of the leg. Sole of the foot, arches of the foot. Mechanism of walking. Venous and lymphatic drainage of the Lower limb. Applied anatomy of nerve and blood supply of lower limb.

HIM 211: Introduction to Health Information Science

(2 Units C: LH 30)

Learning Outcomes

At the end of the course, the students should be able to;

1. extensively explain Health Information Science;
2. distinguish between data, information, knowledge and wisdom;
3. describe the attributes of health information science;
4. explain the relationship between information science and other discipline in medical and allied health sciences;
5. describe information commodity as an economic good;
6. explain information constraint theories and models of information seeking behaviours;
7. elucidate health information processing methods; and
8. explain data operations in automated health information management system.



Course Contents

Definition of health information science. Distinguish between data, information knowledge and wisdom. Attribute of health information, relationship of information science to other discipline in medical and allied health sciences. Information commodity as an economic good. Information perception constraint theory, Shannon and weaver's theory of information , Brooke's Model of Information, Melvin Defleur's. Model of Information Communication, Ellis Model of Information Seeking Behaviours, Wilson Model of Information Seeking Behaviours. Health information processing methods, technology acceptance theory, reason actions theory, data operations in automated health information management system.

HIM 212: Health Records Management I

(2 Units C: LH 30)

Learning Outcomes

At the end of the course, the students should be able to:

1. explain numbering in health records; describe the types and methods of assigning numbers;
2. identify and discuss the types of equipment used and control of numbering system conversion;
3. define filing system and explain its objectives;
4. discuss types and methods of filing system as well as filing control;
5. describe master patient index in the unit system, its purpose, content and arrangement;
6. explain record retention, factors influencing retention and disposition of health records; and
7. appreciate microfilming of health records, objectives of microfilming, processing, design, selection, advantages and disadvantages of microfilming.

Course Contents

Numbering system in health records, methods of numbering system, types and methods of assigning numbers. Types of equipment used and control of numbering system conversion from one system to another and relationship of numbering to filing. Define filing system and state its objectives, types and methods of filing system. Filing control in relation to: requisition and charged-out system, colour coding of records folders, access incomplete records, checking location, physical facilities in the file area, safety, organisational patterns, other file rules and procedures. Conversion from one filing system to another, Transportation of records, equipment and supplies and factors affecting choice. Definition of master patient index in the unit system, master patient index: purpose and content, filing methods, filing equipment, alphabetical index guides, automation of patient index, control of patient index and arrangement of master file. Record retention, factor influencing retention and disposition of health records, health records retention policies, methods of destruction of health records.

Microfilming of health records: definition of microfilm, objectives of records microfilming, uses of microfilm in the hospital records keeping, microfilm processing, steps in designing microfilm system, selecting microfilm for use in hospital records, process of preparing records for microfilming and filling the records including advantages and disadvantages in health records.



HIM 221: Introduction to Information Technology and Organisational Information Security (2 Units C: LH 30)

Learning Outcomes

At the end of the course, the students should be able to:

1. explain management and operations of different multimedia formats;
2. describe the development and use of database systems;
3. demonstrate practical skills on spreadsheet, graphics and PowerPoint presentation;
4. discuss basic concepts and technologies of information security;
5. explain personnel/organisational skills for information security managers and officers; and
6. evaluate information security personnel and non-security information technology personnel.

Course Contents

Management and operations of different multimedia formats; practical exercise in word processing, software packages, Internet surfing and downloading information; micro-form technology; practical exercise on CD-ROM technology; practical hands-on; overhead projector, graphics, power point presentations; development and use of database systems. Introduction to spreadsheet. Basic concepts and technologies of information security. Personnel / organisational skills for information security managers and officers: staffing, training, certification, incentives. Evaluation of information security personnel, non-security information technology personnel and many others. Organisational development related to security awareness, threats and responses; and ethics/ codes of behaviour in information security, security in networked environments.

HIM 222: Knowledge Management in Health Information System (2 Units C: LH 30)

Learning Outcomes

At the end of the course, the students should be able to:

1. describe the history and current status of knowledge management;
2. describe the differences between information and knowledge;
3. explain key management issues consideration and influence of knowledge management of change and organisational effectiveness; and
4. effectively participate in management operations and identify sources of knowledge for health workers.

Course Contents

History, definition and current status of knowledge management. Differences between information and knowledge. Key management issues consideration and influences of knowledge management of change and organisational effectiveness. Planning staff consultancy and participation in knowledge management. Skills requirements of knowledge management operations and evaluation of knowledge management. Sources of knowledge to health workers.



HIM 223: Statistical Methods in Health Information Management I (2 Units C: LH 30)

Learning Outcomes

At the end of the course, the students should be able to:

1. explain the entire concept of index number and be able to apply it;
2. extensively discuss correlation analysis, its uses, types, nature and meaning;
3. explain correlation coefficient, coefficient of determination meaning and interpretation with reference to simple correlation, partial correlation and multiple correlations;
4. mathematically express regression analysis (its meaning and types);
5. extensively explain time analysis (meaning, concepts, methods of measuring trend and methods of determining seasonal indices);
6. describe probability; definition, measurement, permutations and combinations, distribution. mathematical expectations and their applications in health information management;
7. explain estimation and significance testing;
8. define confidence interval; and
9. effectively describe hypothesis, its error, level of significance and test concerning population means and proportion including small and large samples.

Course Contents

Index numbers: meaning and uses of index numbers, problems of construction index numbers, un-weighted index- simple aggregate index, mean of price relatives. Weighted index numbers – use of Laspeyre, Paasche, Fisher Ideal, Marshal Edgeworth. Correlation analysis: meaning of correlation, types of correlation (simple, partial and multiple correlation), nature of correlation (positive, zero and negative) meaning of correlation coefficient and its determination and interpretation with reference to simple correlation, partial correlation and multiple correlation. Spearman's and Kendall Tau Rank Correlation Coefficient, Spearman's Product Moment Correlation Coefficient. Coefficient of determination (meaning and interpretation)

Regression analysis: meaning of regression, types of regression simple, multiple and exponential regression. Simple or linear regression, exponential regression, multiple regression and coefficient of determination.

Time analysis: meaning of time series, basic component, methods of measuring trend (graphical, moving averages, least squares, semi- averages, method for determining seasonal indices (average percentage, moving averages link relative, ratio trend and smoothening. Probability: definition of probability, measurement (addition and multiplication laws applied to mutually exclusive, independent and conditional events) mathematical expectation, permutations and combinations, probability distribution – binomial, hyper geometric, multinomial, Poisson, normal and their applications in health information management. Estimate and significance testing. Define confidence interval, confidence interval for population mean and proportion based on large and small samples. Meaning of hypothesis, type I and type II error, level of significance, test concerning population means and proportions including small and large samples.



HIM 224: Disease Classification, Clinical Coding, Indexing and Abstracting (2 Units C: LH 15; PH 45)

Learning Outcomes

At the end of the course, the students should be able to:

1. appreciate the history of diseases classification, basis and purpose of disease classification;
2. define data classification and explain its aims and objectives;
3. explain the general principles of international classification of diseases process structure of ICD, special coding pattern in the ICD and dual classification of certain diagnostic statements in the ICD;
4. extensively explain the numbering systems of the ICD, the 3-digit and optional 5-digit categories of ICD-9;
5. describe the classification of industrial accidents, the twenty-one chapters of ICD-10 and its arrangements;
6. explain coding, its purpose, tools and procedures as well as selection of conditions for both diagnostic and operational procedures;
7. describe the structure of classification system, indexing, types, methods and uses of index; and
8. discuss traditional and computerized approaches to indexing, abstracting, thesaurus construction and maintenance.

Course Contents

History of diseases classification. Basis and purpose of disease classification. Definition of data classification, aims and objectives of data classification. General principles of International Classification of Diseases (ICD) process. Structure of ICD and special coding pattern in the ICD, dual classification of certain diagnostic statements in the ICD. The numbering system of the ICD, the three digit categories –ICD-9, the operational fifth digits – ICD -9 and the Alphanumeric of the ICD-10, Seventeen chapters of the ICD-9, Supplementary classification of the ICD 9 (E- codes, V-codes, M- codes). Classification of industrial accidents and many others. the twenty-one chapters of ICD-10 and its arrangement. Measuring coding and coding procedure, procedures in surgical operations (major and minor). The structure of the surgical index method of the KD- 9CM Vol. 3 (procedure class) and ICD-10 Vol. 3. The procedure for coding surgical operations and other procedures, the similarities and differences between ICD 9CM Vol. 3 and ICD 10pcs and ICD -10 Vol. 3, tools needed for coding surgical operations. Define index purpose for indexing uses of disease and operation index, information needed for index cards. Indexing system: design index cards, storage. Maintenance and retention simple and cross indexing system, multiple card system, methods of monitoring discharged patients' records. Code diseases and surgical procedures, abstract and index: diseases and surgical procedure, external causes of injuries (Encode), factors influencing health status and contract with health services (V code), morphology and neoplasm. Traditional and computerised approaches to indexing, abstracting, thesaurus construction and maintenance are explained. The nature and structure of indexes, indexing and editing procedures, types of indexes, index-evaluation and professionalism construction of abstract technique



300 Level courses

GST 312: Peace and Conflict Resolution

(2 Units C: LH 30)

Learning Outcomes

At the end of the course, students should be able to:

1. analyse the concepts of peace, conflict and security;
2. list major forms, types and root causes of conflict and violence;
3. differentiate between conflict and terrorism;
4. enumerate security and peace building strategies; and
5. describe roles of international organisations, media and traditional institutions in peace building.

Course Contents

Concepts of Peace, Conflict and Security in a multi-ethnic nation. Types and Theories of Conflicts: Ethnic, Religious, Economic, Geo-political Conflicts; Structural Conflict Theory, Realist Theory of Conflict, Frustration-Aggression Conflict Theory. Root causes of Conflict and Violence in Africa: Indigene and settlers Phenomenon; Boundaries/boarder disputes; Political disputes; Ethnic disputes and rivalries; Economic Inequalities; Social disputes; Nationalist Movements and Agitations; Selected Conflict Case Studies – Tiv-Junkun; Zango Kartaf, Chieftaincy and Land disputes and many others. Peace Building, Management of Conflicts and Security: Peace & Human Development. Approaches to Peace & Conflict Management --- (Religious, Government, Community Leaders and many others). Elements of Peace Studies and Conflict Resolution: Conflict dynamics assessment Scales: Constructive & Destructive. Justice and Legal framework: Concepts of Social Justice; The Nigeria Legal System. Insurgency and Terrorism. Peace Mediation and Peace Keeping. Peace & Security Council (International, National and Local levels) Agents of Conflict resolution – Conventions, Treaties Community Policing: Evolution and Imperatives. Alternative Dispute Resolution, ADR. Dialogue b). Arbitration, c). Negotiation d). Collaboration and many others. Roles of International Organisations in Conflict Resolution. (a). The United Nations, UN and its Conflict Resolution Organs. (b). The African Union & Peace Security Council (c). ECOWAS in Peace Keeping. Media and Traditional Institutions in Peace Building. Managing Post-Conflict Situations/Crisis: Refugees. Internally Displaced Persons, IDPs. The role of NGOs in Post-Conflict Situations/Crisis.

ENT 312: Venture Creation

(2 Units C: LH 15; PH 45)

Learning Outcomes

At the end of this course, students, through case study and practical approaches, should be able to:

1. describe the key steps in venture creation;
2. spot opportunities in problems and in high potential sectors regardless of geographical location;
3. state how original products, ideas, and concepts are developed;
4. develop business concept for further incubation or pitching for funding;
5. identify key sources of entrepreneurial finance;
6. implement the requirements for establishing and managing micro and small enterprises;
7. conduct entrepreneurial marketing and e-commerce;
8. apply a wide variety of emerging technological solutions to entrepreneurship; and



9. appreciate why ventures fail due to lack of planning and poor implementation.

Course Contents

Opportunity Identification (Sources of business opportunities in Nigeria, Environmental scanning, Demand and supply gap/unmet needs/market gaps/Market Research, Unutilised resources, Social and climate conditions and Technology adoption gap). New business development (business planning, market research). Entrepreneurial Finance (Venture capital, Equity finance, Micro finance, Personal savings, Small business investment organisations and Business plan competition). Entrepreneurial marketing and e-commerce (Principles of marketing, Customer Acquisition & Retention, B2B, C2C and B2C models of e-commerce, First Mover Advantage, E-commerce business models and Successful E-Commerce Companies,). Small Business Management/Family Business: Leadership & Management, Basic book keeping, Nature of family business and Family Business Growth Model. Negotiation and Business communication (Strategy and tactics of negotiation/bargaining, Traditional and modern business communication methods). Opportunity Discovery Demonstrations (Business idea generation presentations, Business idea Contest, Brainstorming sessions, Idea pitching). Technological Solutions (The Concept of Market/Customer Solution, Customer Solution and Emerging Technologies, Business Applications of New Technologies - *Artificial Intelligence (AI)*, *Virtual/Mixed Reality (VR)*, *Internet of Things (IoTs)*, *Blockchain*, *Cloud Computing*, *Renewable Energy* and many others. Digital Business and E-Commerce Strategies).

HIM 311: Hospital Official Statistics

(2 Units C: LH 30)

Learning Outcomes

At the end of the course, the students should be able to;

1. appreciate and extensively explain the concept of hospital statistics (definition, history and components);
2. express in-depth knowledge on basic technologies for reporting hospital activities and process of obtaining hospital statistics data;
3. expound the types of hospital admission and process of obtaining hospital statistics data;
4. discuss basic terminologies for reporting hospital activities;
5. describe requirements for obstetrics and pre-natal care, uses of obstetrics and pre-natal data;
6. debate essential hospital data process of hospital data presentation and methods of hospital data presentation;
7. report generation on method of hospital data presentation and hospital official statistics in health; and
8. describe problems in collection, analysis, dissemination and use of official statistics in health.



Course Contents

Definition of hospital statistics, history of hospital statistics and components of hospital statistics. Types of hospital admission process of obtaining hospital statistics data. Basic terminologies for reporting hospital activities such as bed complement, occupied bed days, vacant bed days, through put, turnover interval and average length of stay. Computation of percentages and rates: define rates, types of rates- fertility, morbidity, mortality and many others uses of rate. Definition and uses of percentage occupancy. Explanation and uses of ratios, proportions, average and many others. definition and types of events such as treatment, counselling, advises, operation, ancillary cure and many others. episode of care and type of transfers. Reporting requirements for obstetrics and pre-natal care, uses of obstetrics and pre-natal data. Discharge analysis of hospital services. Definition and essentials of hospital data process of hospital data presentation and methods of hospital data presentation. Report generation and methods of hospital data presentation. Report generation on hospital official statistics in health. Problems in collection, analysis, dissemination and use of official statistics in health. Statistical organisations: national and international.

HIM 312: Policy, Legal and Ethics in Health Information Management (2 Units C: LH 30)

Learning Outcomes

At the end of the course, the students should be able to:

1. comprehend and discuss organisation context within health information managers' practice;
2. describe information as a public/private good, intellectual property;
3. explain privacy, confidentiality, information liability, and freedom of information act, access to information;
4. have in-depth knowledge of elementary labor laws, rules and regulations on organisational staff matters;
5. discuss extensively public health law in Nigeria as well as Nigerian law system and structure;
6. comprehend concepts of ethics, law, values, morals, rules and regulations. sources of ethics, law, and morals;
7. explain confidentiality and security of health information;
8. describe principles and code of ethics for health information management practitioners;
9. identify health records requirements and entries. procedures for reporting and release of health information; and
10. explain the concept of consent for procedures in medicine.

Course Contents

Select concepts, processes, and issue related to the organisation contexts within which health information managers' practice. Topics include information as public/ private good, intellectual property, privacy, confidentiality, information liability, and freedom of information act, access to information, elementary labour laws, rules and regulations on organisational staff matter, and public health laws in Nigeria. Information policy, copyright, and ethical issues. Concepts of Ethics, law, values, morals, rules and regulations. Sources of Ethics, Law, and Morals and many others. Concepts of Privacy, Confidentiality and Security of Health Information. Principles and code of ethics for Health Information Management practitioners. The Nigerian Law System and Structure. Health Records requirements and entries. Procedures for reporting and release of Health Information. Concept of consent for procedures in Medicine.



HIM 313: Database Construction and Management in Health Information System (2 Units C: LH 30)

Learning Outcomes

At the end of the course, the students should be able to:

1. describe file management systems, information retrieval systems and database management system;
2. explain types of database system structure, system analysis for database; requirements analysis and requirements specification;
3. discuss system design for database: conceptual and physical database design;
4. identify query languages, database management issues such as data integrity, data security, backup and recovery as well as database administration; and
5. practically demonstrate the application of DBMS.

Contents Contents

Introduction to the database approach: file management systems, information retrieval systems and database management system. Types of database system structure. System analysis for database; requirements analysis and requirements specification. System design for database: conceptual and physical database design. Query languages, database management issues: data integrity, data security, backup and recovery and database administration.

HIM 314: Statistical Methods in Health Information Management I (2 Units: C: LH 30)

Learning Outcomes

At the end of the course, the students should be able to:

1. explain the role of statistics in human biology medicine and health information management;
2. state and mathematically express analysis of variance: one-way, classification, test for equality of several variances, multiple range test; two-way classification;
3. describe how to test for independence, runs and sign test; and
4. explain and distinguish between different test sample methods.

Course Contents

Role of statistics in Human Biology Medicine and Health Information Management. Analysis of variance: one-way, classification, test for equality of several variance, multiple range test; two-way, classification (single observation per cell) two – way classification (several observation in one cell). Test for independence, runs and sign test, Wilcoxon two-sample test, Wilcoxon test for paired observations, goodness of fit test, Kolmogrov-smirnov one/two sample test, fisher exact probability test. The Friedman test, the Kruskal-walls test, the Mann-Witney test.



HIM 315: Health Records Management II

(2 Units C: LH 30)

Learning Outcomes

At the end of the course, the students should be able to:

1. discuss health records management, forms of Health Records, forms management;
2. explain Patient's records as a legal document;
3. define the principles of file organisation;
4. identify methods of file organisation and hierarchies of information structure; and
5. debate budgeting for health records management.

Course Contents

Definition of health records management, forms of Health Records, forms management, files management, directives management, reports management, micrographics management and reprographics management, personnel management in health records office and medical archives, costing in health records management, purpose and effects of health insurance scheme on health records practice. Patient's records as a legal document such as property rights and ownership, custodian of the record, authorisations, signatories, and many others filing system, file design and organisation, file content (data element) and file review procedures, role of storage, media in file organisation. Principles of file organisation, methods of file organisation and hierarchies of information structure such as logical and physical, structural principles and elements, budgeting for health records management.

HIM 321: Health Care Financing, Insurance Principles and Programme (2 Units C: LH 30)

Learning Outcomes

At the end of the course, the students should be able to:

1. possess ability to identify different sources of finance and its management;
2. explain health insurance and purpose of health insurance scheme;
3. appreciate the assumption of private health insurance;
4. compare and contrast private and government-sponsored health insurance;
5. describe diversity of voluntary medical care insurance plans under different sponsorships; and
6. discuss the scope of coverage and benefits of national health insurance scheme.
7. expound the decree of establishing the national health insurance scheme.

Course Contents

Definition of health care, meaning of finance, sources and management of health care finance, define health insurance, purpose of health insurance scheme. Assumption of private health insurance. Comparison of private and government-sponsored health insurance. Analysis of diversity of voluntary medical care insurance plans under different sponsorships, scope of coverage and benefits of national health insurance scheme, analysis and critique of National Health Insurance scheme, examination of decree establishing the National Health Insurance Scheme.



HIM 322: Fundamental of Medical Practice

(2 Units C: LH 30)

Learning Outcomes

At the end of the course, the students should be able to:

1. explain basic terms in medical practice and definitions of medical terminologies;
2. comprehend common terms in medical terminology;
3. discuss lay terms applicable to medicine;
4. describe disease causation and degeneration diseases process; and
5. explain the terms used for disease causes/symptomatology and common terminologies.

Course Contents

Basic terms in medical practice. Prefixes and suffixes in medical terms. Common terms in medical terminology. Homonyms synonyms and eponyms in medical terminology. Lay terms applicable to medicine. Basic definitions of medical terminologies. Disease causation and process. Degenerative diseases process. Causes and process of cellular growth changes. Common diagnostic abbreviations. Terms used for disease causes/symptomatology. Common terminologies.

HIM 323: Software Applications to Health Information Management (2 Units: C: LH 30)

Learning Outcomes

At the end of the course, the students should be able to:

1. evaluate the various computer applications and their utilisation in a healthcare environment;
2. describe the use and competencies in application software; and
3. explain electronic Health Records compatible software in health data management.

Course Contents

Evaluation of various computer applications and their utilisation in a healthcare environment. Use and competencies in application software such as EPI Info, EPI Data, Health Mapper, SPSS, Microsoft Access and many others. Electronic Health Records compatible software in health data management.

400 Level courses

HIM 411: Computer Applications in Health Information System (2 Units C: LH 30)

Learning Outcomes

At the end of the course, the students should be able to:

1. appreciate the review and expansion of telecommunications and its related technologies;
2. describe the history of the development of network and explain why network fails;
3. describe networking configurations trade-offs between telecommunication and storage in system design;
4. differentiate between physical and logical configuration;
5. discuss compatibility and standard gateways, interconnections, economics of networking, data flows and privacy; and
6. elucidate the governance and policies relating to networks copyright and downloading.

Course Contents



Review and expansion of telecommunications and its related technologies, telephone, modems , telex, videotext, tele text,VANs packet switching, LANs satellite, microwave, fiber optics, and many others. History of the development of network , and why networks fails , networking configurations (star, ring, distributed and many others). Trade-offs between telecommunication and storage in system design, physical; vs. logical configuration, compatibility and standard gateways and interconnections, economics of networking, data flows, privacy and many others. Governance and policies relating to networks copyright, downloading and many others.

HIM 412: Principles of Information Retrieval System I

(2 Units C: LH 30)

Learning Outcomes

At the end of the course, the students should be able to:

1. describe information system for the storage and retrieval of unstructured and structured information;
2. examine information retrieval architectures, processes, retrieval models, query language, and methods of system evaluation; and
3. distinctively emphasise on internet-based services for storing and accessing information to be used in integrated application development.

Course Contents

Introduction to information system for the storage and retrieval of unstructured and structured information. Examines information retrieval architectures, processes, retrieval models, query language, and methods of system evaluation. Gives emphasis to internet-based services for storing and accessing information to be used in integrated application development.

HIM 413: Principles of Management in Health Information System (2 Units C: LH 30)

Learning Outcomes

At the end of the course, the students should be able to:

1. explain the nature of management and field of management;
2. debate the function of management, managing purpose and direction;
3. describe management theories and system theories;
4. describe human relation theory and contingency theories;
5. describe the foundation of organising, organisation and job design;
6. explain the human resources management;
7. describe change management and innovations;
8. describe the concept group and team work;
9. discuss job motivation, job satisfaction of employees, leadership communication and interpersonal skills; and
10. elucidate the dimension of control systems, graduating performance, organisational effectiveness and stress management.



Course Contents

The nature of management, the health information managers and management, the field of management, the functions of management, managing purpose and direction. Management theories; the classical, the behavioral school, the system theory, the human relations theory and the contingency theory. Foundation of organising, organisation and job design, human resources management, managing change and innovations, foundation of behavior, understanding group and team work, job motivation and job satisfaction of employees, leadership communication and interpersonal skills. Dimension of control systems, graduating performance, organisational effectiveness and managing stress.

HIM 414: Research Methods and Proposal Writing in Health Information Management (2 Units: C: LH 30)

Learning Outcomes

At the end of the course, the students should be able to:

1. discuss the concept of research and its benefit to health information management;
2. describe the types of research;
3. identify the steps in the research process;
4. initiate, conduct and present a research project;
5. recognise the importance of ethics in research; and
6. explain the application of research findings to health information management.

Course Contents

Definitions of research, choosing a research topic in health information management, background to the study formulating statement of problems, stating the objectives of the study, stating research questions and formulation of hypotheses, writing significance of study, scope and limitation of study operational Definition of terms. Methods of surveying the literature, sources of information in project writing. Research designs population of study, sampling procedures and sample size. Design of research instruments, methods of validity and reliability of the research instruments, methods of data collection, data analysis, hypothesis testing using chi-squared (χ^2), students "t" test, f- ratio test, normal distribution, analysis of variance and covariance, non-parametric statistics, correlation regression and time series analysis. Definition of Proposal writing, types of research proposal, Contents of Proposal writing, importance of research proposal, content of introductory section, general and specific objectives, statement of problems, justification for research, essential parts of literature proposal, contents of methodology, sampling techniques, various of data collection methods, data analysis and presentation, components of good work plan, cost analysis for proposed activities. Ciantt's method of writing work plan, referencing styles, work plan for the proposed activities, executive summary of the proposal or abstract.



HIM 460: Industrial Practice in Medical and Health Institutions (4 Units C: PH 180)

Practical experience for maximum period of six months in approved medical and health institutions. Writing the Industrial Practice report.

500 Level

HIM 511: Data Communications and Telecommunications Networking (2 Units C: LH 30)

Learning Outcomes

At the end of the course, the students should be able to:

1. describe the general concept and evolution of telecommunications network;
2. describe transmission facilities, data encoding and data transmission techniques;
3. explain the convergence of computers and telecommunications, its transmission links, and procedures;
4. discuss logical and physical communication networks;
5. evaluate the performance of telecommunication systems;
6. appreciate network topologies and hardware;
7. address server operating systems;
8. explain policy issues association with distributed networks;
9. expound data structure in programming languages- debate basic structures for data representation (atomic, simple, complex) and storage allocation; and
10. discuss organisation methods, programming exercises involving implementation of different data structures.

Course Contents

General concept, evolution, telecommunications network, transmission facilities, data encoding, data transmission techniques, convergence of computers and telecommunications, transmission links and procedures: links, switched and leased line. Connections, point- to- point and multipoint broadcast, and asynchronous and synchronous transmission. Logical and physical communication networks, network evolution. Integrated digital network, customer interface, ISDN services and access, broadband ISDN, PABX, wireless communications. Cost modeling and analysis of telecommunication systems. Performance evaluation of telecommunication systems.

Local and wide area computer networking including network topologies and hardware, packet switching, client/server architectures network protocols, and network server and applications. Address server operating systems. Management, security authentication, and policy issues association with distributed network. Data structure in programming languages, basic structures for data representation atomic, simple complex, storage allocation: static, dynamic, linear data structures: strings, stack. Linear list, and many others: graph, sorting and searching algorithms, file structure: organisation methods, programming exercises involving implementation of different data structures.



HIM 512: Health Information System Analysis and Design

(2 Units C: LH 30)

Learning Outcomes

At the end of the course, the students should be able to:

1. apprehend the theoretical and practical examination of information system of information system analysis and design process;
2. explore techniques for accessing the need for technology;
3. define specifications and design process involving users;
4. describe design methods including social impact statements; and
5. discuss the analysis of standard designs and their application/operation in medicine and information management.

Course Contents

Theoretical and practical examination of information system analysis and design process. Explores techniques for assessing the need for technology, defining specifications, and involving users in the design process. Design methods include social impact statements, future scenarios, mock-ups, rapid prototyping, and field- testing. Analysis of standard designs; complete and incomplete block designs, Latin square nested, and other crossed classification design. Design efficiency, factorial experiments, confounding and fractional replication, response surface designs and evolutionary operation in medicine, information management, applications.

HIM 513: Public Relations in Health Information System

(2 Units C: LH 30)

Learning Outcomes

At the end of the course, the students should be able to:

1. mark out with distinctness the history of public relations, public relation process and research;
2. explain communication media in public relations, state the functions of public relations officer;
3. elucidate the objectives of employee communications and communication methods;
4. debate publicity, crisis management and resolutions;
5. evaluate techniques of public relation; and
6. expound public relation financing.

Course Contents

Definition of public relations, the history of public relations public relations process, public relations research, communication media in public relations, functions of public relations officer, objectives of employee communications, communication methods, publicity, crisis management and resolution, evaluation techniques of public relations, public relations financing.

HIM 514: Health Records Management III

(2 Units C: LH 30)

Learning Outcomes

At the end of the course, the students should be able to:

1. apprehend the models of health records management, life cycle and continuum models;
2. discuss classification of health records and filing system;
3. debate records retention and disposition schedule;
4. explain management technology and litigation support;
5. define planning and information system;



6. explain the purpose of health information system, planning process and planning problems of information system;
7. expound the purpose of health information system;
8. identify key participants in planning health information system;
9. process ability to develop a mission statement, set management goals and objectives;
10. develop strategies for change; describe risk analysis, trade-off analysis, feasibility studies and methods of financial health information system;
11. explain investment analysis of health information system and manpower planning in health information system; and
12. describe elements of development of a Health Information System.

Course Contents

Models of health records management, life cycle and continuum models, Health records classification and filing systems, records retention and disposition schedule, records centre management, records protection and security, records mapping, health records quality, Disposition of health records, reprographics and image management technology, and litigation support. Long term management of digital information, information communications in health records office electronic records keeping, enterprise and risk management, system analysis and design, metadata development, data preservation, and technology standards and policy development. Definition of planning and information system, purpose of health information system, planning process and planning problems of information system. Critical health information system issues, basic conceptual framework of health information system planning (Nolan's stage hypothesis). Identifying key participants in planning health information system, developing a mission statement, setting goals an objective, management by objectives, policy making, decision making process, conflict negotiation, and crisis management setting priorities, developing strategies for change, risk analysis, trade-off analysis, feasibility studies, methods of financial health information system, investment analysis of health information system, manpower planning in health information system. Elements of development of a health information system.

HIM 521: Economics and Marketing of Health Information

(2 Units C: LH 30)

Learning Outcomes

At the end of the course, the students should be able to:

1. define economics of health information;
2. distinctively explain the marketing of health information;
3. explain the theories of national choice and utility applied to health information products/services;
4. discuss demands and uses of health information products;
5. debate the cost theory of health information models of value in health information products;
6. describe health information brokerage lifecycle development and market research; and
7. process ability to write proposal, communicate marketing as well as cost and pricing methods.



Course Contents

Definition of economics of health information, and marketing of health information, theories of national choice and utility applied to health information products/ services, demands and uses of health information products. Cost theory of health information models of value of health information products: exchange, use and expectation value, supply and demand functions of health information, marketing mix: price, product, place and promotion as applied to health information (products/ services), market aggregation and segmentation, consumer behavior. Health information life cycle development, market research, health information brokerage, writing proposal, marketing communication, costing and pricing methods.

HIM 522: Preservation and Conservation of Health Records (2 Units C: LH 30)

Learning Outcomes

At the end of the course, the students should be able to:

1. expound preservation and conservation of health record;
2. describe the structure of paper-based records in health records department;
3. explain the de-acidification of paper-based health records;
4. expound electronic health records;
5. discuss security management in conservation of health records;
6. express restoration of health records, medical archives, and archives management;
7. identify the constraints to preservation and conservation of health records in Africa;
8. debate the principles of medical archives management;
9. describe the arrangement of records in medical archives;
10. comprehend disaster management, causes of disaster, benefits, objectives, and guideline for developing a response to disaster;
11. develop a disaster plan, prevent disaster in health record office;
12. identify the roles of insurance company in disaster management; and
13. discuss the role of communication and personnel training.

Course Contents

Definition of preservation and conservation of health records, the structure of paper and paper making, paper based records in health records department. The de-acidification of paper-based health records, non-aqueous record de-acidification of paper-based Health records. Permanence of material in making medical archive information materials. Deterioration of electronic health records, management of pests and microorganism in health records office. Security management of health records conservation of health records, restoration of health records and medical archives. Constraints to preservation and conservation of health records in Africa. Definition of medical archives and medical archives management, principles of medical archives management: provenance and original order, users of medical archives, the role of medical archives manager/medical archivist, developing medical archives policy, plans and procedures, medical archives management facilities, space planning in medical archives, medical archives architectural design, acquisition of ,medical records, appraisal of health records, description of ,medical archives , accessioning and de-accessioning of health records, arrangement of records in the medical archives, functions of medical reference archivist, significance of national Archives decree 30, 1992 to medical archives management and health records management, strategies for meeting demands for medical archives management, budgeting techniques and budgetary control for medical archives management. Staffing and career path development in medical archives management. Definition of disaster and disaster management. State causes of disaster.



Development of a disaster plan, benefits disaster plan, objectives of disaster plan, general guideline for developing a response to disasters, developing a disaster plan. Prevention of disasters in a health record office; disaster prevention activities, response to disaster, reaction to disaster, recovery from disasters, salvaging techniques if damaged materials in Health Records Office, role of insurance company in disasters management, role of communication and personnel training.

HIM 523: Hospital Management, Interdepartmental Structure and Organogram (2 Units C: LH 30)

Learning Outcomes

At the end of the course, the students should be able to:

1. expound hospital- contextual and policy issues;
2. identify the sources and management of hospital finances effective information system;
3. discuss resources management in the hospital;
4. describe labours laws including trade union legislation;
5. explain interdepartmental and intradepartmental structure;
6. explain hospital organogram; and
7. discuss activities and functions of administrative and functions of administrative and clinical directorates.

Course Contents

Hospital-contextual and policy issues, internal organisation and operation. Sources and management of hospital finances, effective information systems, human and logistic resources management in the hospital. Assessing and improving hospital performance, managing the quality of hospital services, labour laws including trade union legislation, conflict resolution and the promotion of industrial harmony in the hospital setting. Meaning of interdepartmental structure and intradepartmental structure. intradepartmental/interdepartmental structure in Primary health care, secondary care facilities and tertiary/specialist hospitals, how to Improve Interdepartmental Relations, conflict, importance of communication, misunderstanding, miscommunication. Meetings and Law of meetings. Hospital organogram: Definition, Components of Board of Management, their appointment, period of service, Directorates, Power and functions of Top Management, Chief/Medical Director, Director of Administration, Chairman, Medical Advisory committee/ Head of Clinical Services, Power and functions of HOD/HOU, Standing committees, ad hoc committees. Activities and Functions of Administrative and Clinical Directorates.



Minimum Academic Standards

Equipment

Public Address System, Projector, Light and Fans

HIM Demonstration room

10 copies of international classification Diseases (ICD) current edition

10 copies of international classification Diseases (ICD PCS) current edition

Staffing

Academic Staff

The guidelines on academic staff/student ratio 1:15 shall apply. There is need to have at least six (6) members of the academic staff. This will be in the ratio of **1:2:3**, which is translated into one coming from:

| | |
|-------------------------|----------------------------|
| Professor/Reader | 1 |
| Senior Lecturers | 2 |
| Lecturers 1 and below | 3 (at least two with Ph.D) |
| Laboratory Technologist | 2 |
| Laboratory Assistant | 3 |
| Laboratory Attendance | 3 |
| Secretary | 1 |
| Officer Assistants | 1 |

Non Academic Staffs which includes

- 1 Qualified and Certified professional secretary
 - 1 Clerical Staff
 - 1 Office Assistant
 - 1 Cleaner
- Minimum standards for library

E-library

Functional computers
Internet connectivity
Current application packages

Classroom

Minimum of four class-rooms capable of accommodating at least fifty (50) students comfortably, with overhead projector for teaching.

A hall with a capacity to hold 150 -200 students during examination; adequate walk space of a meter wide between the rows.

Laboratory

A computer laboratory with a minimum of 50 computer systems/lap-tops with electronic health record software approved by the Board/Regulatory Council installed for teaching purpose. The computers must be connected to the internet with an overhead projector for teaching. A printer and photocopier provided for students use.

Model Health Record Demonstration Room for practical teaching (the room should have a health records management department setup)

Offices



Well-equipped office of the Head of Department with toilet, adequate infrastructure (such as refrigerator, television set, air conditioned), furniture and having adjoining office of the secretary well-equipped with computer set/laptop, printer, photocopying machine and projector. Separate offices for senior lecturers and above.
Offices for other lecturers, not more than two (2) in an office.

Classrooms, Laboratories and Office Spaces

Classroom

The standard requirement of 0.65m^2 per full-time student should be maintained. Thus the minimum total space requirement for a faculty or department shall be the product of its total full time equivalent student enrolment (FTE) and the minimum space requirement per full-time equivalent i.e. (FTE) 0.65m^2 .

Office

In this respect, each academic staff should have an office space of at least 25 square metres taking into cognisance the status/cadre of the staff

In addition, there should be for the Faculty, a Dean's office and for each Department a Head of Department's office with attached offices for their supporting staff as specified below in m^2 :

| | | |
|----------------------------------|---|-------|
| Professor's office | - | 18.50 |
| Head of Department's office | - | 18.50 |
| Tutorial teaching staff's office | - | 13.50 |
| Other teaching staff space | - | 7.00 |
| Technical staff space | - | 7.00 |
| Secretarial space | - | 7.00 |
| Staff research laboratory | - | 16.50 |
| Seminar Space/per student | - | 1.85 |
| Laboratory space (per student) | - | 7.50 |



B.Sc. Information Technology and Health Informatics

Overview

We live in a world that is rapidly being transformed by Big Data and Information Technology. The information that has always swirled around us, just out of reach, ripe with the potential to reveal mysteries of science, behavior, and society is now something we have the capacity to collect, collate, and analyse.

The combination of rapid advances in information technology and information gathering has given healthcare that option. But only highly-trained professionals with the right skills, the right imagination, and the highest ethical standards can deliver on those promises. The degree in Information Technology and Health Informatics (ITH) would educate students to become computer scientists in the health industry. Informatics-based, medical, scientific and technical knowledge in healthcare and in the healthcare industry are influential in management.

This course provides knowledge and skills to design information systems for the healthcare sector and throughout the healthcare industry to develop, configure, operate and comply with the applicable rules and regulations. ITH graduates would deliver medical data and improve information systems in healthcare organisations for better outcomes and more efficient service delivery in the health sector.

Philosophy

Information Technology and Health informatics is a growing field. The job market for ITH professionals is increasing and expected to continue doing so. Individuals with deep understanding of leadership in information-enabled healthcare organisations are in high demand. This program is designed to enhance the knowledge and expertise of those who see the challenges of our changing health system. ITH graduates are expected to bring positive transformation to our healthcare system.

Objectives

The objective of Bachelor Degree programme in Information Technology and Health Informatics are to:

1. produce young and component potential university degree holders as manpower with adequate knowledge and skills in ITH;
2. develop students' abilities in using ITH knowledge and skills to solve health and other relatives problems);
3. equip students with the capacity for professional practice in computing and communications;
4. develop in students a range of transferrable skills of information technology to other aspects of human endeavours;
5. build students to be creative, innovative and self-reliant in the competitive Nigerian labour market and similar environments across the globe;
6. enable students to appreciate the relevance of Information Technology in contemporary industrial, economic and social environment; and



7. encourage others not yet knowledgeable in ITH utilisation develop interest and be part of the project).

Unique Features of the Programme

The unique features of the programme is as follows:

1. the programme is an interdisciplinary offering that blends three disciplines: health services administration, management information systems, and computer science;
2. ITH degree programme prepares students for a career as a health information technology professional with the skills to manage and use health information and emerging electronic information technologies in the health care industry; and
3. ITH programme prepares students to participate in the design of data schemas for health information systems, in the definition and analysis of requirements for health information systems, in the design, deployment and querying of reporting systems via both direct query and reporting tools for use in administrative, clinical and support areas.

Employability Skills

Information Technology and Health informatics professionals are tasked with the important responsibilities of obtaining, storing, organising and leveraging data to improve the services provided by the healthcare industry. As data becomes an increasingly important resource in this field, demand for professionals who can efficiently and effectively work with this information is also on the rise.

The following skills are what is expected of ITH graduate:

1. **ability to solve problem:** Graduate of ITH will involve problem-solving in various settings especially hospital environment. That may come in the form of clinical challenges, such as improving the sharing of patient data between providers, or involve information technology processes that need to be improved. While these tasks require intimate knowledge of ITH;
2. **programming knowledge**
ITH graduates are expected to be able to programme in languages like Java, C, Python, and SQL. It is expected that ITH graduate should be able to develop inhouse software and manage Information Technology Unit of the hospital;
3. **ability to work with health data systems**
Information Technology and Health Informatics professional, should be able to work closely with the health data systems used in the hospital. Consequently, developing skills in this area is important for succeeding in obtaining and excelling in an ITH role. As best practices in the effective utilisation of information technology applications are constantly evolving, this area is something that even seasoned ITH professionals would engaging with to advance their organisation's goals and status in the marketplace;
4. **communication and Interpersonal skills**
ITH graduates should be able to interact effectively with other people. The skills include abilities such as conflict resolution, flexibility, empathy and teamwork. These traits are very important to succeed in a team environment, an important requirements of the Information and Technology health informatics field.

In addition, ITH graduate rarely work completely on their own. The nature of the job often requires collaboration between Information Technology professionals, clinical staff and organisational decision-makers, To work closely with all of these professionals in an effective way enroute to team objectives, the ITH graduate need to have well-developed interpersonal skills and team building skills.



21st Century Skills

1. Collaboration and team work
2. Creativity and imagination
3. Critical thinking
4. Problem solving
5. Flexibility and adaptability
6. Information Literacy
7. Leadership
8. Civic literacy and citizenship
9. Social responsibility
10. Technology literacy
11. Initiative

Admission and Graduation Requirements

Admission Requirements for UTME and Direct Entry

The entry requirements for the degree program are:

a) Five-Year Degree Programme requirements

UTME subjects must include English Language, Mathematics, Physics and Chemistry.

Five Credit level passes at not more than two sittings, which must include English Language, Mathematics, Chemistry, Physics, and Biology or Agricultural Science, at Senior Secondary Certificate (SSC).

b) Direct Entry (DE) requirements

The following may be considered subject to minimum requirements in (a) above:

Two A'Level passes with minimum of C grade in Mathematics, Physics and Chemistry;

A minimum Upper Credit pass in National Diploma in Computer Science/Health Information Management from a recognised Polytechnic or its equivalent.

Graduation Requirements

The duration of the programme is normally 10 academic semesters for UTME and eight academic semesters for the Direct Entry candidates. If a candidate fails to graduate within the stipulated academic semesters, he or she will not be allowed to exceed a total of 15 academic semesters in the case of UTME candidate and 13 semesters in the case of Direct Entry candidate.

To be eligible for the award of B.Sc./B.Tech. Degree in Information Technology and Health Informatics, the student must have:

1. passed all the core courses, university and school required courses.
2. accumulated a minimum of 150 course units for students admitted through UTME and 120 for students admitted through Direct Entry; and
3. attain a minimum CGPA of 1.50.



Global Course Structure

100 Level

| Course Code | Course Title | Unit(s) | Status | LH | PH |
|-------------|---|-----------|--------|----|----|
| GST 111 | Communication in English | 2 | C | 15 | 45 |
| GST 112 | Nigerian People and Culture | 2 | C | 30 | - |
| BIO101 | General Biology | 2 | C | 30 | - |
| CHM101 | General Chemistry I | 2 | C | 30 | - |
| CHM 102 | General Chemistry II | 2 | C | 30 | - |
| CHM103 | General Practical Chemistry I | 1 | C | - | 45 |
| CHM 104 | General Practical Chemistry II | 1 | C | - | 45 |
| COS101 | Introduction to Computing I | 3 | C | 30 | 45 |
| MTH 101 | General Mathematics I | 2 | C | 30 | - |
| MTH 102 | General Mathematics II | 2 | C | 30 | - |
| PHY101 | General Physics I | 2 | C | 30 | - |
| PHY 102 | General Physics II | 2 | C | 30 | - |
| PHY107 | General Experimental Physics I | 1 | C | - | 45 |
| PHY 108 | General Experimental Physics II | 1 | C | - | 45 |
| ITH 102 | Introduction to Problem Solving in Healthcare | 2 | C | 30 | - |
| ITH 104 | Introduction to Health Informatics | 2 | C | 30 | - |
| | Total | 29 | | | |

200 Level

| Course Code | Course Title | Unit(s) | Status | LH | PH |
|-------------|---------------------------------------|-----------|--------|----|----|
| GST 212 | Philosophy, Logic and Human Existence | 2 | C | 30 | - |
| ENT 211 | Entrepreneurship and Innovation | 2 | C | 30 | - |
| ITH 201 | Basic Medical Terminology | 2 | C | 30 | - |
| ITH 203 | Introduction to Biostatistics | 2 | C | 30 | - |
| ITH 205 | Fundamental of Information Technology | 2 | C | 30 | - |
| COS202 | Introduction to Operating System | 3 | C | 30 | 45 |
| ITH 202 | Introduction to Epidemiology | 3 | C | 45 | - |
| ITH 204 | Medical Billing & Coding | 2 | C | 30 | - |
| ANA 201 | Anatomy of Upper and Lower Limb | 2 | C | 15 | 45 |
| ITH 208 | Electronic Health Records | 2 | C | 30 | - |
| COS 201 | Computer Programming I | 3 | C | 30 | 45 |
| | Total | 25 | | | |



300 Level

| Course Code | Course Title | Unit(s) | Status | LH | PH |
|--------------------|--|----------------|---------------|-----------|-----------|
| GST 312 | Peace and Conflict Resolution | 2 | C | 30 | - |
| ENT 312 | Venture Creation | 2 | C | 15 | 45 |
| ITH 301 | Database Design and Management in Healthcare | 3 | C | 30 | 45 |
| ITH 303 | Object Oriented Design and Programming | 2 | C | 30 | - |
| ITH 305 | System Analysis and Design | 2 | C | 30 | - |
| ITH 307 | Survey of Medical Informatics | 2 | C | 30 | - |
| COS 30I | Fundamentals of Data Structures | 2 | C | 30 | - |
| COS302 | Web Programming | 3 | C | 30 | 45 |
| COS 304 | Introduction to Artificial Intelligence | 3 | C | 30 | 45 |
| | Total | 21 | | | |

400 Level

| Course Code | Course Title | Unit(s) | Status | LH | PH |
|--------------------|--|----------------|---------------|-----------|-----------|
| ITH 401 | Introduction to Data Science with R Language | 2 | C | 30 | 45 |
| ITH 403 | Mobile Application Development | 2 | C | 30 | 45 |
| ITH 405 | Research Methodology in ITH | 2 | C | 30 | - |
| ITH 407 | Digital Forensics | 2 | C | 30 | - |
| COS 405 | Data Communication and Networking | 2 | C | 30 | 45 |
| COS 407 | Human Computer Interface | 2 | C | 30 | - |
| COS 401 | Principles of Compiler Construction | 2 | C | 30 | - |
| | Total | 14 | | | |

500 Level

| Course Code | Course Title | Unit(s) | Status | LH | PH |
|--------------------|---|----------------|---------------|-----------|-----------|
| COS 501 | Techniques in Software Engineering | 2 | C | 30 | - |
| ITH 503 | Individual Project I | 2 | C | | 90 |
| ITH 505 | Data Mining & Data Warehousing | 2 | C | 30 | - |
| ITH 502 | Information Technology Project Management in Healthcare | 2 | C | 30 | - |
| ITH 504 | Individual Project II | 2 | C | | 90 |
| ITH 506 | Public Health Informatics | 2 | C | 30 | - |
| COS 503 | Web Server Administration | 2 | C | 30 | - |
| ITH 508 | System Administration and Management in Health Care | 2 | C | 30 | - |
| | Total | 16 | | | |

Course Contents and Learning Outcomes

GST 111: Communication in English

(2 Units C: LH 15; PH 45)

Learning Outcomes

At the end of this course, students should be able to

1. identify possible sound patterns in English Language;
2. list notable Language skills;
3. classify word formation processes;
4. construct simple and fairly complex sentences in English;
5. apply logical and critical reasoning skills for meaningful presentations;
6. demonstrate an appreciable level of the art of public speaking and listening; and
7. write simple and technical reports.

Course Contents

Sound patterns in English Language (vowels and consonants, phonetics and phonology). English word classes (lexical and grammatical words, definitions, forms, functions, usages, collocations). Sentence in English (types: structural and functional, simple and complex). Grammar and Usage (tense, mood, modality and concord, aspects of language use in everyday life). Logical and Critical Thinking and Reasoning Methods (Logic and Syllogism, Inductive and Deductive Argument and Reasoning Methods, Analogy, Generalisation and Explanations). Ethical considerations, Copyright Rules and Infringements. Writing Activities: (Pre-writing , Writing, Post writing, Editing and Proofreading; Brainstorming, outlining, Paragraphing, Types of writing, Summary, Essays, Letter, Curriculum Vitae, Report writing, Note making and many others. Mechanics of writing). Comprehension Strategies: (Reading and types of Reading, Comprehension Skills, 3RsQ). Information and Communication Technology in modern Language Learning. Language skills for effective communication. Major word formation processes. Writing and reading comprehension strategies. Logical and critical reasoning for meaningful presentations. Art of public speaking and listening.

GST 112: Nigerian Peoples and Culture

(2 Units C: LH 30)

Learning Outcomes

At the end of this course, students should be able to:

1. analyse the historical foundation of the Nigerian culture and arts in pre-colonial times;
2. list and identify the major linguistic groups in Nigeria;
3. explain the gradual evolution of Nigeria as a political unit;
4. analyse the concepts of Trade, Economic and Self-reliance status of the Nigerian peoples towards national development;
5. enumerate the challenges of the Nigerian State towards Nation building
6. analyse the role of the Judiciary in upholding people's fundamental rights
7. identify acceptable norms and values of the major ethnic groups in Nigeria; and
8. list and suggest possible solutions to identifiable Nigerian environmental, moral and value problems.



Course Contents

Nigerian history, culture and art up to 1800 (Yoruba, Hausa and Igbo peoples and culture; peoples and culture of the ethnic minority groups). Nigeria under colonial rule (advent of colonial rule in Nigeria; Colonial administration of Nigeria). Evolution of Nigeria as a political unit (amalgamation of Nigeria in 1914; formation of political parties in Nigeria; Nationalist movement and struggle for independence). Nigeria and challenges of nation building (military intervention in Nigerian politics; Nigerian Civil War). Concept of trade and economics of self-reliance (indigenous trade and market system; indigenous apprenticeship system among Nigeria people; trade, skill acquisition and self-reliance). Social justices and national development (law definition and classification. Judiciary and fundamental rights. Individual, norms and values (basic Nigeria norms and values, patterns of citizenship acquisition; citizenship and civic responsibilities; indigenous languages, usage and development; negative attitudes and conducts. Cultism, kidnapping and other related social vices). Re-orientation, moral and national values (The 3R's – Reconstruction, Rehabilitation and Re-orientation; Re-orientation Strategies: Operation Feed the Nation (OFN), Green Revolution, Austerity Measures, War Against Indiscipline (WAI), War Against Indiscipline and Corruption(WAIC), Mass Mobilization for Self-Reliance, Social Justice and Economic Recovery (MAMSER), National Orientation Agency (NOA). Current socio-political and cultural developments in Nigeria.

BIO 101: General Biology I

(2 Units C: LH 30)

Learning Outcomes

At the end of lectures in Plant Biology, students should be able to:

1. explain cell structure and organisations;
2. summarise functions of cellular organelles;
3. characterise living organisms and state their general reproduction;
4. describe the interrelationship that exists between organisms;
5. discuss the concept of heredity and evolution; and
6. enumerate habitat types and their characteristics.

Course Contents

Cell structure and organisation. Functions of cellular organelles. Characteristics and classification of living things. Chromosomes, genes their relationships and importance. General reproduction. Interrelationships of organisms (competitions, parasitism, predation, symbiosis, commensalisms, mutualism, saprophytism); heredity and evolution (introduction to Darwinism and Lamarkism. Mendelian laws. Explanation of key genetic terms), elements of ecology and types of habitats.

CHM 101: General Chemistry I

(2 Units C: LH 30)

Learning Outcomes

At the end of this course, the students should be able to:

1. define atom, molecules and chemical reactions;
2. discuss the modern electronic theory of atoms;
3. write electronic configurations of elements on the periodic table;
4. rationalise the trends of atomic radii, ionization energies, electronegativity of the elements based on their position in the periodic table;
5. identify and balance oxidation – reduction equation and solve redox titration problems;
6. draw shapes of simple molecules and hybridised orbitals;



7. identify the characteristics of acids, bases and salts, and solve problems based on their quantitative relationship;
8. apply the principles of equilibrium to aqueous systems using le chatelier's principle to predict the effect of concentration, pressure and temperature changes on equilibrium mixtures;
9. analyse and perform calculations with the thermodynamic functions, enthalpy, entropy and free energy; and
10. determine rates of reactions and its dependence on concentration, time and temperature.

Course Contents

Atoms, molecules, elements and compounds and chemical reactions. Modern electronic theory of atoms. Electronic configuration, periodicity and building up of the periodic table. Hybridisation and shapes of simple molecules. Valence Forces; Structure of solids. Chemical equations and stoichiometry; Chemical bonding and intermolecular forces, kinetic theory of matter. Elementary thermochemistry; rates of reaction, equilibrium and thermodynamics. Acids, bases and salts. Properties of gases. Redox reactions and introduction to electrochemistry. Radioactivity.

CHM 102: General Chemistry II

(2 Units C: LH 30)

Learning Outcomes

At the end of this course, the students should be able to:

1. state the importance and development of organic chemistry;
2. define fullerenes and its applications;
3. discuss electronic theory;
4. determine the qualitative and quantitative of structures in organic chemistry;
5. state rules guiding nomenclature and functional group classes of organic chemistry;
6. determine rate of reaction to predict mechanisms of reaction;
7. identify classes of organic functional group with brief description of their chemistry;
8. discuss comparative chemistry of group 1a, iia and iva elements; and
9. describe basic properties of transition metals.

Course Contents

Historical survey of the development and importance of Organic Chemistry; Fullerenes as fourth allotrope of carbon. uses as nanotubules. nanostructures. nanochemistry. Electronic theory in organic chemistry. Isolation and purification of organic compounds. Determination of structures of organic compounds including qualitative and quantitative analysis in organic chemistry. Nomenclature and functional group classes of organic compounds. Introductory reaction mechanism and kinetics. Stereochemistry. The chemistry of alkanes, alkenes, alkynes, alcohols, ethers, amines, alkyl halides, nitriles. Aldehydes, ketones, carboxylic acids and derivatives. The Chemistry of selected metals and non-metals. Comparative chemistry of group IA, IIA and IVA elements. Introduction to transition metal chemistry.



CHM 107: General Chemistry Practical I

(1 Unit C: PH 45)

Learning Outcomes

At the end of this course, the students should be able to:

1. state the general laboratory rules and safety procedures;
2. collect scientific data and correctly carrying out chemical experiments;
3. identify the basic glassware and equipment in the laboratory;
4. identify the differences between primary and secondary standards;
5. perform redox titration;
6. recording observations and measurements in the laboratory notebooks; and
7. analyse the data to arrive at scientific conclusions.

Course Contents

Laboratory experiments designed to reflect topics presented in courses CHM 101 and CHM 102. These include acid-base titrations. qualitative analysis. redox reactions. gravimetric analysis. data analysis and presentation.

CHM 108: General Chemistry Practical II

(1 Unit C: PH 45)

Learning Outcomes

At the end of this course, the students should be able to:

1. identify the general laboratory rules and safety procedures;
2. collect scientific data and correctly carrying out chemical experiments;
3. identify the basic glassware and equipment in the laboratory;
4. identify and carry out preliminary tests which includes ignition, boiling point, melting point, test on known and unknown organic compounds;
5. perform solubility tests on known and unknown organic compounds;
6. conduct elemental tests on known and unknown compounds; and
7. conduct functional group/confirmatory test on known and unknown compounds which could be acidic / basic / neutral organic compounds.

Course Contents

Continuation of CHM 107. Additional laboratory experiments to include functional group analysis, quantitative analysis using volumetric methods.

COS 101: Introduction to Computing Sciences

(3 Units C: LH 30; PH 45)

Learning Outcomes

At the end of the course, students should be able to:

1. explain basic components of computers and other computing devices;
2. describe the various applications of computers;
3. explain information processing and its roles in the society;
4. describe the Internet, its various applications and its impact;
5. explain the different areas of the computing discipline and its specialisations; and
6. demonstrate practical skills on using computers and the internet.



Course Contents

Brief history of computing. Description of the basic components of a computer/computing device. Input/Output devices and peripherals. Hardware, software and human ware. Diverse and growing computer/digital applications. Information processing and its roles in society. The Internet, its applications and its impact on the world today. The different areas/programs of the computing discipline. The job specialisations for computing professionals. The future of computing.

Lab Work: Practical demonstration of the basic parts of a computer. Illustration of different operating systems of different computing devices including desktops, laptops, tablets, smart boards and smart phones. Demonstration of commonly used applications such as word processors, spreadsheets, presentation software and graphics. Illustration of input and output devices including printers, scanners, projectors and smartboards. Practical demonstration of the Internet and its various applications. Illustration of browsers and search engines. How to access online resources.

MTH 101: Elementary Mathematics I (Algebra and Trigonometry) (2 Units C: LH 30)

Learning Outcomes

At the end of this course students should be able to:

1. explain basic definition of Set, Subset, Union, Intersection, Complements and use of Venn diagrams;
2. solve quadratic equations;
3. Solve trigonometric functions;
4. identify various types of numbers; and
5. solve some problems using Binomial theorem.

Course Contents

Elementary set theory, subsets, union, intersection, complements, venn diagrams. Real numbers, integers, rational and irrational numbers. Mathematical induction, real sequences and series. Theory of quadratic equations. Binomial theorem. Complex numbers. Algebra of complex numbers. The Argand diagram. De-Moivre's theorem, nth roots of unity. Circular measure, trigonometric functions of angles of any magnitude, addition and factor formulae.

MTH 102 Elementary Mathematics II (Calculus)

(2 Units C: LH 30)

Learning Outcomes

At the end of this course, the students should be able to:

1. identify types of rules in Differentiation and Integration;
2. describe the meaning of Function of a real variable, graphs, limits and continuity; and
3. solve some applications of definite integrals in areas and volumes.

Course Contents

Function of a real variable, graphs, limits and idea of continuity. The derivative, as limit of rate of change. Techniques of differentiation. Extreme curve sketching; Integration as an inverse of differentiation. Methods of integration, Definite integrals. Application to areas, volumes.

PHY 101: General Physics I (Mechanics)

(2 Units C: LH 30)



Learning Outcomes

At the end of this course, the students should be able to:

1. identify and deduce the physical quantities and their units;
2. differentiate between vectors and scalars;
3. describe and evaluate motion of systems on the basis of the fundamental laws of mechanics;
4. apply Newton's laws to describe and solve simple problems of motion;
5. evaluate work, energy, velocity, momentum, acceleration, and torque of moving or rotating objects;
6. explain and apply the principles of conservation of energy, linear and angular momentum;
7. describe the laws governing motion under gravity; and
8. explain motion under gravity and quantitatively determine behaviour of objects moving under gravity.

Course Contents

Space and time. units and dimension. Vectors and Scalars. Differentiation of vectors: displacement. velocity and acceleration. kinematics. Newton laws of motion (Inertial frames. Impulse. force and action at a distance. momentum conservation). Relative motion. Application of Newtonian mechanics. Equations of motion. Conservation principles in physics. Conservative forces. Conservation of linear momentum. Kinetic energy and work. Potential energy. System of particles. Centre of mass. Rotational motion. Torque. vector product. Moment. Rotation of coordinate axes and angular momentum. Polar coordinates. conservation of angular momentum. Circular motion. Moments of inertia. gyroscopes and precession. Gravitation: Newton's Law of Gravitation. Kepler's Laws of Planetary Motion. Gravitational Potential Energy. Escape velocity. Satellites motion and orbits.

PHY 102: General Physics II (Electricity & Magnetism)

(2 Units C: LH 30)

Learning Outcomes

At the end of this course, the students should be able to:

1. describe the electric field and potential, and related concepts, for stationary charges;
2. calculate electrostatic properties of simple charge distributions using Coulomb's law, Gauss's law and electric potential;
3. describe and determine the magnetic field for steady and moving charges;
4. determine the magnetic properties of simple current distributions using Biot-Savart and Ampere's law;
5. describe electromagnetic induction and related concepts, and make calculations using Faraday and Lenz's laws;
6. explain the basic physical of Maxwell's equations in integral form;
7. evaluate DC circuits to determine the electrical parameters; and
8. determine the characteristics of ac voltages and currents in resistors, capacitors, and Inductors



Course Contents

Forces in nature. Electrostatics; electric charge and its properties, methods of charging. Coulomb's law and superposition. electric field and potential. Gauss's law. Capacitance. Electric dipoles. Energy in electric fields. Conductors and insulators, current, voltage and resistance. Ohm's law and analysis of DC circuits. Magnetic fields. Lorentz force. Biot-Savart and Ampère's laws. magnetic dipoles. Dielectrics. Energy in magnetic fields. Electromotive force. Electromagnetic induction. Self and mutual inductances. Faraday and Lenz's laws. Step up and step-down transformers: Maxwell's equations. Electromagnetic oscillations and waves. AC voltages and currents applied to inductors, capacitors, resistance, and combinations.

PHY 107: General Practical Physics I

(1 Unit C: PH 45)

Learning Outcomes

At the end of this course, the students should be able to:

1. conduct measurements of some physical quantities;
2. make observations of events, collect and tabulate data;
3. identify and evaluate some common experimental errors;
4. plot and analyse graphs; and
5. draw conclusions from numerical and graphical analysis of data.

Course Contents

These introductory courses emphasise quantitative measurements. the treatment of measurement errors. and graphical analysis. A variety of experimental techniques should be employed. The experiments include studies of meters. the oscilloscope. mechanical systems. electrical and mechanical resonant systems. Light, Heat, viscosity and many others. covered in PHY 101 and PHY 102. However. emphasis should be placed on the basic physical techniques for observation. measurements. data collection. analysis and deduction.

PHY 108: General Practical Physics II

(1 Unit C: PH 45)

Learning Outcomes

At the end of this course, the student should be able to:

1. conduct measurements of some physical quantities;
2. make observations of events, collect and tabulate data;
3. identify and evaluate some common experimental errors;
4. plot and analyse graphs;
5. draw conclusions from numerical and graphical analysis of data; and
6. prepare and present practical reports.

Course Contents

This practical course is a continuation of PHY 107 and is intended to be taught during the second semester of the 100 level to cover the practical aspect of the theoretical courses that have been covered with emphasis on quantitative measurements. The treatment of measurement errors, and graphical analysis. However, emphasis should be placed on the basic physical techniques for observation, measurements, data collection, analysis and deduction.



ITH 102: Introduction to Problem Solving in Health Informatics (2 Units C: LH 30)

Learning Outcomes

At the end of this course, student should be able to:

1. read a problem description and apply an appropriate algorithm to solve that problem;
2. formulate a solution to a problem in algorithmic form using pseudocode;
3. reason about the correctness of an algorithm
4. reason about the runtime of an algorithm;
5. implement an algorithm as a part of an executable program; and
6. implement basic data structures (such as arrays, lists, trees) and use algorithmic techniques (recursion and divide & conquer) to solve well-known problems (searching and sorting), but also how to apply their principles to newly encountered problems.

Course Contents

Role of Algorithms in problem solving process, concepts and properties of Algorithms. Implementation strategies, Development of Flow Charts, Pseudo Codes. Program objects. Implementation of Algorithms in a programming Language - Visual BASIC/JAVA/C/C++

ITH 104: Introduction to Health Informatics

(2 Units C: LH 30)

Learning Outcomes

At the end of this course, student should be able to:

1. describe the theoretical and practical foundations of health informatics;
2. explain how information and communication technologies are changing healthcare services and provision of health information;
3. discuss the various applications of information and communication technology for healthcare, health promotion and patient self-management;
4. discuss key issues related to the adoption of health information technology systems (digital divide, health literacy, policy issues, privacy and security); and
5. explore emerging trends in health informatics.

Course Contents

Basic concepts, knowledge and skills of Health Informatics. Way data, information and knowledge are created, managed and processed using Information and Communication Technology. Introduction to Health Informatics as a Discipline, Basics of Electronics Health Records, Computerised Physician Order Entry, Medical databases, Imaging, Tele-health, Consumer Health Informatics, Ethics in Health Informatics, social and organisational factors involved in implementation of electronic health systems, and Integration standards such as HL7. Historical perspectives of computing in health.



200 Level

GST 212: Philosophy, Logic and Human Existence

(2 Units C: LH 30)

Learning Outcomes

A student who has successfully gone through this course should be able to:

1. enumerate basic features of philosophy as an academic discipline;
2. identify the main branches of philosophy & the centrality of logic in philosophical discourse;
3. describe the elementary rules of reasoning;
4. distinguish between valid and invalid arguments;
5. think critically and assess arguments in texts, conversations and day-to-day discussions;
6. critically assess the rationality or otherwise of human conduct under different existential conditions;
7. develop the capacity to extrapolate and deploy expertise in logic to other areas of knowledge; and
8. guide his or her actions, using the knowledge and expertise acquired in philosophy and logic.

Course Contents

Scope of philosophy; notions, meanings, branches and problems of philosophy. Logic as an indispensable tool of philosophy. Elements of syllogism, symbolic logic— the first nine rules of inference. Informal fallacies, laws of thought, nature of arguments. Valid and invalid arguments, logic of form and logic of content — deduction, induction and inferences. Creative and critical thinking. Impact of philosophy on human existence. Philosophy and politics, philosophy and human conduct, philosophy and religion, philosophy and human values, philosophy and character molding, and many others.

ENT 211: Entrepreneurship and Innovation

(2 Units C: LH 30)

Learning Outcomes

At the end of this course, students should be able to:

1. explain the concepts and theories of entrepreneurship, intrapreneurship, opportunity seeking, new value creation, and risk taking
2. state the characteristics of an entrepreneur;
3. analyse the importance of micro and small businesses in wealth creation, employment, and financial independence;
4. engage in entrepreneurial thinking;
5. identify key elements in innovation;
6. describe stages in enterprise formation, partnership and networking including business planning;
7. describe contemporary entrepreneurial issues in Nigeria, Africa and the rest of the world; and
8. state the basic principles of e-commerce.



Course Contents

Concept of Entrepreneurship (Entrepreneurship, Intrapreneurship/Corporate Entrepreneurship,). Theories, Rationale and relevance of Entrepreneurship (Schumpeterian and other perspectives, Risk-Taking, Necessity and opportunity-based entrepreneurship and Creative destruction). Characteristics of Entrepreneurs (Opportunity seeker, Risk taker, Natural and Nurtured, Problem solver and change agent, Innovator and creative thinker). Entrepreneurial thinking (Critical thinking, Reflective thinking, and Creative thinking). Innovation (Concept of innovation, Dimensions of innovation, Change and innovation, Knowledge and innovation). Enterprise formation, partnership and networking (Basics of Business Plan, Forms of business ownership, Business registration and Forming alliances and joint ventures). Contemporary Entrepreneurship Issues (Knowledge, Skills and Technology, Intellectual property, Virtual office, Networking). Entrepreneurship in Nigeria (Biography of inspirational Entrepreneurs, Youth and women entrepreneurship, Entrepreneurship support institutions, Youth enterprise networks and Environmental and cultural barriers to entrepreneurship). Basic principles of e-commerce.

ITH 201: Basic Medical Terminology

(2 Units C: LH 30)

Learning Outcomes

At the end of this course, student should be able to:

1. identify, pronounce, and spell medical terms;
2. use terms in context; utilise prefixes, suffixes, root words, and plurals to construct medical terms;
3. analyse medical terms.
4. translate abbreviation and interpret symbols;
5. demonstrate ability to analyse words by dividing them into component parts;
6. identify and employ terms pertaining to the body as a whole;
7. demonstrate ability to apply new knowledge to understanding medical terms in their proper contexts;
8. differentiate among the various classes of drugs and learn their actions and side effects; and
9. differentiate among various laboratory tests, clinical procedures, and clinical healthcare professionals.

Course Contents

Basic medical terminology vocabulary for use in the health care setting. Prefixes, suffixes, and root words of medical terms and their meaning, spelling, and pronunciation. Building a working medical vocabulary based on body systems. How to become successful communicators (especially in the health care setting).

COS 201: Computer Programming I

(3 Units C: LH 30; PH 45)

Learning Outcomes

At the end of this course, students should be able to:

1. explain the principles of good programming and structured programming concepts;
2. explain the programming constructs, syntax and semantics of a higher-level language;
3. describe the chosen programming language variables, types, expressions, statements and assignment; simple input and output;



4. describe the program control structures, functions and parameter passing, and structured decomposition; and
5. develop simple program in the taught programming language as well as debug and test them.

Course Contents

Introduction to computer programming. Functional programming; Declarative programming; Logic programming; Scripting languages. Introduction to object-orientation as a technique for modelling computation. structured, and even some level of functional programming principles; Introduction of a typical object-oriented language, such as Java; Basic data types, variables, expressions, assignment statements and operators; Basic object-oriented concepts: abstraction; objects; classes; methods; parameter passing; encapsulation. Class hierarchies and programme organisation using packages/namespaces; Use of API – use of iterators/enumerators, List, Stack, Queue from API; Searching; sorting; Recursive algorithms; Event-driven programming: event-handling methods; event propagation; exception handling. Introduction to Strings and string processing; Simple I/O; control structures; Arrays; Simple recursive algorithms; inheritance; polymorphism.

Lab work: Programming assignments; design and implementation of simple algorithms, such as average, standard deviation, searching and sorting; Developing and tracing simple recursive algorithms. Inheritance and polymorphism.

ITH 202: Introduction to Epidemiology

(2 Units C: LH 45)

Learning Outcomes

At the end of this course, student should be able to:

1. define epidemiology and describe its relationship with medicine and public health;
2. identify parameters related to morbidity and mortality;
3. define, interpret, and calculate measures of event occurrence;
4. define, compare, and contrast the design of case-control, cross sectional, cohort, and randomized trials;
5. define and identify concepts of causality;
6. identify and distinguish common types of bias; and
7. evaluate and discuss practical issues in designing and implementing epidemiological studies.

Course Contents

Introducing the history and concepts of epidemiology, using principles and methods of both descriptive and analytical epidemiology to address public health problems and issues. Practical application of epidemiology, measures of morbidity and mortality, descriptive epidemiology, causation, source of epidemiological data, epidemiological studies' design, measure of effect, data interpretations issues, and screening for disease in the community.



ITH 203: Introduction to Biostatistics

(2 Units C: LH 30)

Learning Outcomes

At the end of this course, student should be able to:

1. recognise the importance of data collection and its role in determining scope of inference;
2. demonstrate a solid understanding of interval estimation and hypothesis testing;
3. identify and apply appropriate statistical methods for analysing one or two variables;
4. utilise technology to perform descriptive and inferential data analysis for one or two variables;
5. interpret statistical results correctly, effectively, and in context;
6. identify and critique data-based claims; and
7. appreciate the power of data.

Course Contents

Description foundational concepts of biostatistics. Introduction to application of basic theoretical concepts of biostatistics in health science, epidemiology, and public health. Knowledge of measurement scales, types of variables and data along with various statistical methods for summarising and presenting different types of data will be provided. Introduction of the concept of probability with its applications in epidemiology and public health. Moderate level presentation of important probability distributions applied commonly in epidemiology and public health.

ITH 205: Fundamentals of Information Technology

(2 Units C: LH 30)

Learning Outcomes

At the end of this course, student should be able to:

1. itemise basic concepts and terminology of information technology;
2. have a basic understanding of personal computers and their operations; and
3. identify issues related to information security.

Course Contents

Pervasive themes in information technology; information technology systems model; a gentle introduction to information technologies – human–computer interaction, information management; networking, platform technologies, programming, and web systems and technologies; data versus information; history of information technology and internet; information technology and its related and informing disciplines; information technology application domains.

COS 202: Introduction to Operating System

(2 Units C: LH 30)

Learning Outcomes

At the end of this course, student should be able to:

1. discuss the different services provided by Operating System at different level;
2. explain real life applications of Operating System in every field;
3. explain the use of different process scheduling algorithm and synchronisation techniques to avoid deadlock; and
4. identify different memory management techniques like paging, segmentation and demand paging and many others.

Course Contents

Introduction: Role of OS: Types of OS, Batch Systems; Multiprogramming; Time Sharing;



Distributed & Real time OS. Computer structure and OS: System Architecture – I/O, Storage, Processors; System components- OS Services, System Calls, System Programs; System Design, Implementation and Generation. Process Management: Concepts of process: Process status, Process description, Process model. Process Scheduling: Concepts, Scheduler organisation, preemptive and non- preemptive scheduler strategies, scheduling algorithms: FCFS, SJN, Priority Scheduling, Round Robin Scheduling, Multiple Processor scheduling, Thread Concepts and Multiple threaded OS. Process Synchronisation and Deadlock: Process Co-operation, Concepts of Inter-processcommunication, Process Synchronisation, Synchronisation Issues, Critical Section problem, Mutual exclusion Primitives and Algorithms, Process Synchronisation with semaphores. Concepts of Deadlock, Conditions for Deadlocks, Resource Concepts & Abstractions, Deadlock Prevention, Avoidance and Recovery, Banker Algorithms for Deadlock Avoidance. Memory Management and File system: Paging, Segmentation and Contiguous memory allocation. Virtual Memory: Demand Paging, Page replacement and Frame Allocation policies, Thrashing. File System: Concepts, Access Method, Directory Structure, and File System Management. Disk management and other issues: Disk management: Disk Structure and Scheduling. Filesystems, and operating system support for distributed systems. Protection and Security related issues. Case studies of contemporary operating systems.

ITH 204: Medical Billing and Coding

(2 Units C: LH 30)

Learning Outcomes

At the end of this course, student should be able to:

1. identify crucial roles of the Physician Documentation in the coding process;
2. identify codeable services;
3. accurately utilise ICD Codes;
4. accurately utilise CPT codes & HCPC for supplies/DME and procedures;
5. perform hospital outpatient/inpatient coding and physician practice coding;
6. define coding from a reimbursement perspective;
7. utilise appropriate coding in anesthesia, surgery, radiology, pathology, and medical services;
8. billing and claims processing (physician practice & hospital), appeals, and collections;
9. completing CMS-1500 forms (both manual and electronic); and
10. describe electronic health records (EHR) systems.

Course Contents

In the traditional paper based patient record, data are available mainly as a free text. This patient record is primarily used for patient care itself. Nowadays the data presented in patient records is used for other tasks than patient care. For example, they are used for report generation to different local and international organisation, research studies, health resource allocation, case mix management, public health education, medical billing and insurance. For all the mentioned there is a need to transfer this medical data to a standard coding using international classification systems. This course introduces the students to different clinical coding/classification and nomenclature systems such as SNOMED, CPT, HCPS and ICD-O and the essential coding concepts and phases. The course is enhanced by practical exercises to strengthen students' understanding of different steps for accurately select and use different coding system based on coding purpose. The course emphasises on applying those concepts to medical billing and explains to the students' different stages for proper diagnostic and procedural coding and forms preparation for billing or reporting to the health insurance provider.



ANA 201: Anatomy of Upper and Lower Limbs

(2 Units C: LH 15; PH 45)

Learning outcomes

At the end of the course, the student should be able to:

1. define fundamental anatomical terminology and discuss the anatomical position;
2. describe the anatomy of the musculoskeletal system, including the axial skeleton; appendicular skeleton, appendicular and axial muscles, and arthrology;
3. describe the general features of the bones of the upper and lower limbs;
4. identify the major muscles of the upper and lower limbs;
5. explain the types and structure of the joints of the upper and lower limbs;
6. correlate between the attachment of the muscles and their functions on the different joints;
7. identify the major nerves of the upper and lower limbs;
8. describe the functional components of each of the major nerves and its distribution;
9. identify and describe the course of the major superficial veins of the upper and lower limbs; and
10. name the major arteries of the upper and lower limbs.

Course Contents

Descriptive terms, plans and terms of relationship of the human body, terms of comparison, attachment of muscles, types of muscles, movements of joints. Osteology, principles of kinesiology, general organization of body system. Cutaneous innervation of the upper limb; pectoral region; breast; axilla; shoulder region; arm and cubital fossa; flexor compartment of forearm; extensor compartment of forearm; hand; venous and lymphatic drainage of the upper limb. Applied anatomy of nerves; blood supply of the upper limb. Cutaneous innervation of the lower limb; femoral triangle; adductor canal and medial side of the thigh; gluteal region; back of the thigh, popliteal fossa; extensor compartment of the leg and dorsum of the foot; peroneal and flexor compartment of the leg; sole of the foot, arches of the foot; mechanism of walking; venous and lymphatic drainage of the lower limb; applied anatomy of the nerves and blood supply to the lower limb.

ITH 208: Electronic Health Records

(2 Units C: LH 30)

Learning Outcomes

At the end of this course, student should be able to:

1. apply basic conceptual framework of a medical charting system to the organisation and use of an Electronic Health Record (EHR);
2. extract and use an Electronic Health Record (EHR) in a medical office;
3. apply federal and state regulations and policies to facilitate EHR utilisation in the Health Services industry;
4. incorporate knowledge of EHR and Personal Health Record (PHR) into their personal health care decisions;
5. apply relevant ethical, legal, and security principles to the use of EHR within the health information technology environment; and
6. analyse trends in EHR data and utilisation to improve patient care and population health.

Course Contents



History of Electronic Health Record and its development for the past 40 years. Why and how EHR should replace paper-based health record. Technical components to design and build EHR. Management and social aspects of HER.

300 Level

GST 312: Peace and Conflict Resolution

(2 Units C: LH 30)

Learning Outcomes

At the end of this course, students should be able to:

1. analyse the concepts of peace, conflict and security;
2. list major forms, types and root causes of conflict and violence;
3. differentiate between conflict and terrorism;
4. enumerate security and peace building strategies; and
5. describe roles of international organisations, media and traditional institutions in peace building

Course Contents

Concepts of Peace, Conflict and Security in a multi-ethnic nation. Types and Theories of Conflicts: Ethnic, Religious, Economic, Geo-political Conflicts; Structural Conflict Theory, Realist Theory of Conflict, Frustration-Aggression Conflict Theory. Root causes of Conflict and Violence in Africa: Indigene and settlers Phenomenon; Boundaries/boarder disputes; Political disputes; Ethnic disputes and rivalries; Economic Inequalities; Social disputes; Nationalist Movements and Agitations; Selected Conflict Case Studies – Tiv-Junkun; Zango Kartaf, Chieftaincy and Land disputes and many others. Peace Building, Management of Conflicts and Security: Peace & Human Development. Approaches to Peace & Conflict Management - (Religious, Government, Community Leaders and many others.. Elements of Peace Studies and Conflict Resolution: Conflict dynamics assessment Scales: Constructive & Destructive. Justice and Legal framework: Concepts of Social Justice; The Nigeria Legal System. Insurgency and Terrorism. Peace Mediation and Peace Keeping. Peace & Security Council (International, National and Local levels) Agents of Conflict resolution – Conventions, Treaties Community Policing: Evolution and Imperatives. Alternative Dispute Resolution, ADR. Dialogue b). Arbitration, c). Negotiation d). Collaboration and many others. Roles of International Organisations in Conflict Resolution. (a). The United Nations, UN and its Conflict Resolution Organs. (b). The African Union & Peace Security Council (c). ECOWAS in Peace Keeping. Media and Traditional Institutions in Peace Building. Managing Post-Conflict Situations/Crisis: Refugees. Internally Displaced Persons, IDPs. The role of NGOs in Post-Conflict Situations/Crisis.

ENT 312: Venture Creation

(2 Units C: LH 15; PH 45)

Learning Outcomes

At the end of this course, students, through case study and practical approaches, should be able to:

1. describe the key steps in venture creation;
2. spot opportunities in problems and in high potential sectors regardless of geographical location;



3. state how original products, ideas, and concepts are developed;
4. develop business concept for further incubation or pitching for funding;
5. identify key sources of entrepreneurial finance;
6. implement the requirements for establishing and managing micro and small enterprises;
7. conduct entrepreneurial marketing and e-commerce;
8. apply a wide variety of emerging technological solutions to entrepreneurship; and
9. appreciate why ventures fail due to lack of planning and poor implementation.

Course Contents

Opportunity Identification (Sources of business opportunities in Nigeria, Environmental scanning, Demand and supply gap/unmet needs/market gaps/Market Research, Unutilised resources, Social and climate conditions and Technology adoption gap). New business development (business planning, market research). Entrepreneurial Finance (Venture capital, Equity finance, Micro finance, Personal savings, Small business investment organisations and Business plan competition). Entrepreneurial marketing and e-commerce (Principles of marketing, Customer Acquisition & Retention, B2B, C2C and B2C models of e-commerce, First Mover Advantage, E-commerce business models and Successful E-Commerce Companies,). Small Business Management/Family Business: Leadership & Management, Basic book keeping, Nature of family business and Family Business Growth Model. Negotiation and Business communication (Strategy and tactics of negotiation/bargaining, Traditional and modern business communication methods). Opportunity Discovery Demonstrations (Business idea generation presentations, Business idea Contest, Brainstorming sessions, Idea pitching). Technological Solutions (The Concept of Market/Customer Solution, Customer Solution and Emerging Technologies, Business Applications of New Technologies - *Artificial Intelligence (AI)*, *Virtual/Mixed Reality (VR)*, *Internet of Things (IoTs)*, *Blockchain*, *Cloud Computing*, *Renewable Energy* and many others. Digital Business and E-Commerce Strategies).

COS 301: Fundamental of Data Structures

(2 Units C: LH 30)

Learning Outcomes

At the end of the course, students should be able to:

1. describe fundamental Data Structures including linked-lists, trees, binary search trees, AVL trees, stacks, queues, priority queues, and hash-tables and skiplists;
2. explain fundamental abstract data types which can include: Maps, Sets and Vectors;
3. explain program data structures and use them in implementation of abstract data types;
4. devise novel solutions to small scale programming challenges involving data structures and recursion;
5. describe the basic algorithmic complexity;
6. estimate the algorithmic complexity of simple, non-recursive programs;
7. perform simple inductive proofs and proofs by contradiction and reason about program correctness and invariants; and
8. select appropriate data structures and algorithms for problems and to justify that choice.

Course Contents

Stacks, linked lists; trees, priority queues; search trees; sorting; hashing, garbage collection; storage management; maps and dictionaries; text processing; graphs. Introduction to algorithms and their importance, mathematical foundations: growth functions, complexity analysis of algorithms, summations, recurrences, sorting algorithms. Algorithm design: divide-and-conquer



approach, greedy approach. Graph algorithms and its applications in games. String matching. Dynamic programming and longest common subsequence. Theory of NP-completeness.

ITH 301: Database Design and Management in Healthcare (3 Units C: LH 30; PH 45)

Learning Outcomes

At the end of the course, students should be able to:

1. describe key concepts of relational database management systems;
2. explain key management issues surrounding database technology and emerging business applications enabled by database technology;
3. interpret the importance of database design through Entity Relationship Diagrams and models (ERD);
4. design and understand queries using Structured Query Language (SQL); and
5. perform a real-world database design and implementation in Microsoft Access and MySQL.

Course Contents

The theory, design, development, and management of modern relational databases. Basic technical skills for the class covers database design and implementation: entity-relationship modeling, normalisation, structured query language, and database management. Rational Databases: Mapping conceptual schema to relational Schema; Database Query Languages (SQL) Concept of Functional dependencies & Multi-valued dependencies. Transaction processing; Distributed databases.

ITH 303: Object-Oriented Design and Programming

(3 Units C: LH 30)

Learning Outcomes

At the end of the course, students should be able to:

1. explain the steps in creating an executable program for a computer, including the intermediate representations and their purpose;
2. manipulate binary patterns and understand the use of binary to represent numbers;
3. apply good programming style and understand the impact of style on developing and maintaining programs;
4. effectively use a version control system and the Linux command line tools for incremental development;
5. explain the benefits of object-oriented design and understand when it is an appropriate methodology to use;
6. design object-oriented solutions for small systems involving multiple objects;
7. implement, test and debug solutions in C++;
8. identify the relative merits of different algorithmic designs;
9. independently find and interpret discipline related documentation; and
10. explain the relevance of ethics in the context of Software Engineering.

Course Contents

Basic OOP Concepts: Classes, Objects, inheritance, polymorphism, Data Abstraction, Tools for developing, Compiling, interpreting and debugging, Java Programs, Java Syntax and data objects, operators. Central flow constructs, objects and classes programming, Arrays, methods. Exceptions, Applets and the Abstract, OLE, Persistence, Window Toolkit, Laboratory exercises in an OOP Language.



COS 302: Web Programming

(3 Units C: LH 30; PH 45)

Learning Outcomes

At the end of the course, students should be able to:

1. describe the major areas and challenges of web programming;
2. distinguish web-related technologies;
3. apply advanced topics in HTML5, CSS3, JavaScript;
4. apply a server-side scripting language, PHP;
5. use a relational DBMS, MySQL;
6. use PHP to access a MySQL database; and
7. design and implement:
 - a. typical static web pages and interactive web applications.
 - b. dynamic web applications.
 - c. web applications that use asynchronous communication.
 - d. secure 3-tier data-driven web applications.

Course Contents

1. Topics in HTML, CSS3, JavaScript
 - a. Event handling.
 - b. Positioning and centering, overlapping and displaying a popup box, and dimming an area and disabling events over an area.
 - c. Reading data from the user and sending the data to the server
 - d. Iframe
2. Dynamic Web Applications
 - a. 3-tier architecture for web applications
 - b. MVC (Model-View-Controller) model
3. Server-Side Scripting using PHP
 - a. Control statements
 - b. Strings and numbers
 - c. Arrays
 - d. Functions
4. MySQL DBMS
 - a. SQL statements for data manipulation
 - b. Introduction to MySQL
 - c. How to use PHP to access MySQL
5. Functions Advanced Web Programming
 - a. Secure communication and encryption/decryption
 - b. Regular expression
 - c. Session management and timeout
 - d. Pushing data to client
 - e. Asynchronous communications with JSON, XML, and AJAX
 - f. Server-Sent Event (SSE)
 - g. Development of API using classes and objects

ITH 305: System Analysis and Design

(2 Units C: LH 30)

Learning Outcomes



At the end of the course, students should be able to:

1. describe the principles and tools of systems analysis and design;
2. explain the application of computing in different context;
3. explain the professional and ethical responsibilities of practicing the computer professional including understanding the need for quality;
4. solve a wide range of problems related to the analysis, design and construction of information systems;
5. analyse and design systems of small sizes;
6. present projects; and
7. plan and undertake a major individual project, prepare and deliver coherent and structured verbal and written technical reports.

Course Contents

System Analysis Fundamentals: Introducing SA&D; SA&D concepts, Roles of system analyst; The system development life cycle, Using CASE tools; Depicting system graphically, determining feasibility, activity planning and control; Information requirements analysis: Sampling and investigating data, interviewing.

Prototyping; The analysis process Using data flow diagram; Using data dictionaries; Describing process specifications and structured decisions; The system proposal; The essentials of design designing output; designing input' Designing the file or database Designing the user interface Designing data; Documenting the design phase; Software engineering and implementation Quality assurance through software engineering; Implementing the information system.

ITH 307: Survey of Medical Informatics

(2 Units C: LH 30)

Learning Outcomes

At the end of the course, students should be able to:

1. define Medical Informatics and explain its component competencies as they relate to various roles in the practice of medicine, including clinical care, research, and lifelong learning;
2. retrieve, appraise, and apply medical information for clinical decision-making and patient education using a variety of decision support tools and other information resources;
3. discuss the impact of the electronic health record, government systems/resources, and "big data" on patient care, biomedical research, and practice management;
4. define health literacy concepts and utilise them in patient education and communication; and
5. develop a personal information management plan that demonstrates basic knowledge of information technologies, tools, and resources.

Course Contents

Introduction to the use of computers for processing, organising, retrieving and utilising biomedical information at the molecular, biological system, clinical and healthcare organisation levels. Description of essential concepts in biomedical informatics that are derived from medicine, computer science and the social sciences.

COS 304: Introduction to Artificial Intelligence

(3 Units C: LH 30; PH 45)

Learning Outcomes

At the end of the course, students should be able to:



1. explain an overview of the field of artificial intelligence, its background, history, fundamental issues, challenges and main directions;
2. interpret and formulate knowledge representations in the form of logic expressions;
3. explain basic concepts, methods and theories for search;
4. account for classical planning of proactive agents;
5. describe methods and theories for reactive agents, architectures based on subsumption, and potential fields;
6. describe the physical structure of robots;
7. account for different degrees of autonomy of robots;
8. explain concepts, methods and theories of embodied cognition and situatedness;
9. explain basic concepts, methods and theories of sensing; and
10. explain basic concepts, methods and theories of neural networks and learning.

Course Contents

This is an introductory course on Artificial Intelligence. The topics include;

Overview: foundations, scope, problems, and approaches of AI. Intelligent agents: reactive, deliberative, goal-driven, utility-driven, and learning agents; Artificial Intelligence programming techniques. Problem-solving through Search: forward and backward, state-space, blind, heuristic, problem-reduction, A, A*, AO*, minimax, constraint propagation, neural, stochastic, and evolutionary search algorithms, sample applications. Knowledge Representation and Reasoning: ontologies, foundations of knowledge representation and reasoning, representing and reasoning about objects, relations, events, actions, time, and space; predicate logic, situation calculus, Content logics, reasoning with defaults, reasoning about knowledge, sample applications. Planning: planning as search, partial order planning, construction and use of planning graphs. Representing and Reasoning with Uncertain Knowledge: probability, connection to logic, independence, Bayes rule, bayesian networks, probabilistic inference, sample applications. Decision-Making: basics of utility theory, decision theory, sequential decision problems, elementary game theory, sample applications. Machine Learning and Knowledge Acquisition: learning from memorisation, examples, explanation, and exploration. learning nearest neighbor, naive Bayes, and decision tree classifiers, Q-learning for learning action policies, applications. Sample Applications of AI, student project presentations.



COS 401: Principles of Compiler Construction

(2 Units C: LH 30)

Learning Outcomes

At the end of the course, students should be able to:

1. express the grammar of a programming language;
2. design lexical and syntax analysers and use them in the construction of scanners and parsers;
3. perform the operations of semantic analysis;
4. build a code generator;
5. use different compiler optimization schemes in addition to efficient register allocation and garbage collection; and
6. design and program a complete working compiler for a given language.

Course Contents

Basic concepts of compiler, Application of regular expressions in lexical scanners, Parsing (concrete and abstract syntax, abstract syntax trees), Application of context-free grammars in table-driven and recursive-descent parsing, Symbol table management, code generation by tree walking, Compilation approaches – Multi pass, Single Pass, Load and Go; Compiler implementation - Scanning, syntax directed table driven, Architecture-specific operations: instruction selection and register allocation, Optimization techniques and The use of tools in support of the translation process and the advantages of Program libraries and separate compilation Building syntax-directed tools.

ITH 401: Introduction to Data Science with R Language (2 Units C: LH 15; PH 45)

Learning Outcomes

At the end of the course, students should be able to:

1. recognise the R language environment;
2. connect participants to R Studio, an advanced environment for using the R language (scripts, projects, customizing R studio);
3. identify R language syntax, how to write proper code for solving a given problem. They will learn how to work with variables to store data, and how to apply functions to data;
4. develop strong foundation on the R data-types and data-structures (vectors, matrices, lists, data, frames) and how to properly work with them (access data, modify, filter). A good foundation of R data structures is very important for progressing in R for Data Science;
5. participants will learn the plot functions with base R, such as scatter plots, bar plots, box plots, histograms. They will learn how to use plot functions for exploratory data analysis (outliers, correlations, missing data). Participants will also learn how to customise plots (labels, colors, legends, margins) and export them for publications;
6. articulate the most basic statistical techniques for experimental data, including t-tests, analysis of variance and linear regression;
7. explain how to import and export data and will get to know the test datasets that R provides for practicing their skills; and
8. identify how to get help from the R help system and documentation. They will be able to deal with many common errors and will learn which sources to use to get more help online (official R documentation and forums).

Course Contents



Introduction to data science, using R and R Studio; R language syntax. Writing of R code, learn about R data-types and data-structures, exploring data and produce plots. How to use R for analysing experimental data using simple statistical techniques like t-tests, analysis of variance and linear regression. Application of the techniques with R. Cleaning up datasets to creating interactive and reproducible reports with transferable skills that would apply to any scientific or business domain.

COS 405: Data Communications and Computer Networks (2 Units C: LH 15; PH 45)

Learning Outcomes

At the end of the course, students should be able to:

1. explain principles and parts of system architectures for networks and describe system functions in the architecture that is necessary for functioning network summarise and explain how networks in whole function;
2. explain, calculate and discuss data communication and data links for both point-to-point and shared links describe necessary functions for links with correct descriptions and to carry out calculations of capacity, error handling and throughput;
3. explain network structures and principles of addressing and routing with correct terminology and distinguish and discuss networks on data link network layer carry out routing calculations and describe protocols for packet switching; and
4. explain and illustrate the concepts of application and service and describe the function of given systems and user applications explain the functions in the transport protocol for reliable transfer with correct descriptions and apply them on selected problems.

Course Contents

This course examines computer networks and data communication. Topics include: Network services and applications: DNS, HTTP, peer-to-peer systems, socket programming; Network transport architectures, TCP, UDP, TCP congestion control; Routing and forwarding, intra- domain and inter-domain routing algorithms; Link layers and local area networks, especially Ethernet and WiFi; As time permits: Software-defined networking and network function virtualisation; The Internet of Things (IoT); Multimedia communications and quality of service; Network measurement, inference, and management; Network experimentation and performance analysis; Network security; Protocol verification. Introduction, waves, Fourier analysis, measure of communication, channel characteristics, transmission media, noise and distortion, modulation and demodulation, multiplexing, TDM FDM and FCM Parallel and serial transmission (synchronous vs asynchronous). Bus structures and loop systems, computer network Examples and design consideration, data switching principles broadcast techniques, network structure for packet switching, protocols, Content of network such as ARPANET, and many others.



ITH 403: Mobile Application Development

(2 Units C: LH 15; PH 45)

Learning Outcomes

At the end of the course, students should be able to:

1. identify the basic knowledge on mobile application environment and technology;
2. explain the concepts and processes of mobile application development;
3. discuss design and development issues specific to mobile applications; and
4. design and develop mobile applications, using development tools and environments.

Course Contents

Introduction to developing mobile applications, beginning with mobile operating systems capabilities and application architecture and extending to major components, such as activities, services, broadcast receivers and many others. Development of interactive applications using widget libraries, web-based services, animation, an SQL database engine, and multithreading.

ITH 405: Research Methodology in ITH

(2 Units C: LH 30)

Learning Outcomes

At the end of the course, students should be able to:

1. explain how established techniques of research and enquiry are used to extend, create and interpret knowledge in ITH;
2. have a conceptual understanding sufficient to: evaluate critically current research and advanced scholarship in Computer Science and propose possible alternative directions for further work;
3. deal with complex issues at the forefront of the academic discipline of Computer Science in a manner, based on sound judgements, that is both systematic and creative;
4. demonstrate self-direction and originality in tackling and solving problems within the domain of Information Technology and Health Informatics;
5. act autonomously in planning and implementing solutions in a professional manner and define, plan, and/or carry out a project related to research and to communicate conclusions clearly to both specialists and non-specialists; and
6. state the skills set to be able to continue to advance their knowledge and understanding, and to develop new skills to a high level, with respect to continuing professional development as a "self-directed life-long learner" across the discipline of ITH.

Course Contents

Introduction and overview of the module; the nature of ITH research; Definition of research. Literature searches, information gathering; Reading and understanding research papers. Technical writing, referencing, bibliographies. Presentation skills, written and oral. Choosing or proposing a project. Project planning, tools and techniques for planning. Project conduct, time management, risk management, team working. Commercial and economic considerations in IT research and IT industry. Review of legal, ethical, social and professional (LSEP) issues including data protection and standards.



ITH 407: Digital Forensics

(2 Units C: LH 30)

Learning Outcomes

At the end of this course, students should be able to:

1. explain the origins of forensic science;
2. explain the difference between scientific conclusions and legal decision-making;
3. explain the role of digital forensics and the relationship of digital forensics to traditional forensic science, traditional science and the appropriate use of scientific methods;
4. outline a range of situations where digital forensics may be applicable and
5. identify and explain at least three current issues in the practice of digital forensic investigations.

Course Contents

Computer devices, Data collection, Evidence Collection, Extraction and preservation of evidence, Data Recovery, Evidence preservation, verification & authentication, Data Discovery & Identification, Data Analysis, Computer Forensics Tools, Data Hiding Techniques, Computer forensics and mobile forensics.

COS 407: Human Computer Interaction

(2 Units C: LH 30)

Learning Outcomes

At the end of the course, students should be able to:

1. analyse Human-Computer Interaction principle and designs in Information Systems;
2. compare various HCI designs to gain knowledge on user-centric interfaces;
3. evaluate the internet sites considering; usability and user appreciation designs;
4. appraise social websites such as; facebook, linkedin, twitter or others from user-centric and HCI viewpoint;
5. construct conceptual basis to design HCI that includes: problems, goals, user interaction style, as well as user-centric interface design;
6. apply Information Systems tools to prototype the end-user design; and
7. develop end-user interfaces incorporating problem solving solutions in HCI.

Course Contents

The theory and practices of Human-Computer Interfaces (HCI) from information systems angle would be discussed. Various industry and web HCI designs will be evaluated from the user-centered perspective utilising information systems. Rapid prototyping and comparative evaluation of design are essential parts of this course. In addition, users' expectation of interface design, interaction and usability components and user-centered HCI evaluation and development will be covered.



COS 501: Techniques in Software Engineering

(2 Units C: LH 30)

Learning Outcomes

At the end of the course, students should be able to:

1. identify, formulate, and solve software engineering problems, including the specification, design, implementation, and testing of software systems that meet specification, performance, maintenance and quality requirements;
2. elicit, analyse and specify software requirements through a productive working relationship with various stakeholders of a software development project;
3. function effectively as a team member;
4. exhibit professional, ethical and social responsibility of a software engineer;
5. participate in design, development, deployment and maintenance of a medium scale software development project;
6. convey technical material through oral presentation and interaction with an audience;
7. convey technical material through written reports which satisfy accepted standards for writing style;
8. use Unified Modeling Language in software specification documents; and
9. evaluate the impact of potential solutions to software engineering problems in a global society, using the knowledge of contemporary issues and emerging software engineering trends, models, tools, and techniques.

Course Contents

Software Design Concepts and principles, design of software quality, abstraction, refinement, modularity, software architecture, control hierarchy, structural partitioning, data structure. Design methodology, data, architectural, transformation mapping. Post processing design; optimization; interface design, Foundations of human-computer interaction: Human-centered development and evaluation. Procedural design: structure programming, graphical notation, tabular notation. Program Design Language (PDL), A PDL example, Object-oriented design: Concept of patterns and the use of APIs; modeling tools such as class diagrams, CRC cards, and UML use cases, Software: re-use and re-engineering, Client/server Software Development, Computer aided Software Development.

COS 503: Web Server Administration

(2 Units C: LH 30)

Learning Outcomes

At the end of the course, students should be able to:

1. use basic Linux commands;
2. use basic Windows Server commands;
3. install the Apache Web Server;
4. install the Internet Information Server;
5. configure the Domain Name Service (DNS);
6. administer and manage a web server; and
7. monitor and analyse the web server environment such as review logs.



Course Contents

This course introduces students to web server administration. Students learn to install, administer, update and secure an Internet and/or Intranet web site. At least two web servers: Apache and Internet Information Server will be used. Also, students will learn some Linux and Windows Server commands

ITH 503: Individual Project I

(2 Units C: PH 90)

Final year student project

ITH 504: Individual Project II

(2 Units C: PH 90)

Final year student project

ITH 505: Data Mining and Data Warehousing

(2 Units C: LH 30)

Learning Outcomes

At the end of the course, students should be able to:

1. describe what data mining is and how data mining can be employed and applied to solve real problems;
2. recognise whether a data mining solution is a feasible alternative for a specific problem;
3. apply basic statistical tests to evaluate the results of data mining models;
4. develop a comprehensive understanding of how several data mining techniques can be applied to solve problems; and
5. identify the common designs and structures of warehouse systems.

Course Contents

Fundamentals of data mining, Data Mining Functionalities, Classification of Data Mining systems, Data Mining Task Primitives, Integration of a Data Mining System with a Database or a Data Warehouse System, Information retrieval, machine learning, optimisation, microeconomics, algorithms, mathematical formulas, computer programs, analytic tools and online portals, Data Cleaning, Data Integration and Transformation, Data Reduction, Discretisation and Concept Hierarchy Generation, Data Warehouse and OLAP Technology for Data Mining: Data Warehouse, Multidimensional Data Model, Data Warehouse Architecture, Data Warehouse Implementation, Further Development of Data Cube Technology, From Data Warehousing to Data Mining Data Cube Computation and Data Generalisation

ITH 502: IT Project Management in Healthcare

(2 Units C: LH 30)

Learning Outcomes

At the end of the course, students will be able to:

1. describe a project life cycle, and can skillfully map each stage in the cycle;
2. identify the resources needed for each stage, including involved stakeholders, tools and supplementary materials;
3. describe the time needed to successfully complete a project, considering factors such as task dependencies and task lengths;
4. provide internal stakeholders with information regarding project costs by considering factors such as estimated cost, variances and profits; and
5. develop a project scope while considering factors such as customer requirements and internal/external goals.



Course Contents

This course is mainly designed to prepare students with the knowledge to be IT project managers with project management skills needed to better manage IT projects. Basic concepts of IT project management, including initiating, planning, controlling, executing, and closing projects. The course also shows how IT projects should be managed, from inception to post implementation review. Improving management skills and abilities to define the project scope, creating workable project plan, and manage within the budget and schedule.

ITH 506: Public Health Informatics

(2 Units C: LH 30)

Learning Outcomes

At the end of the course, students should be able to:

1. describe the fundamentals of computers organisation;
2. gain knowledge of various components of database applications and management;
3. have a comprehensive understanding of how informatics can be used to meet public health needs at a local, national and international level;
4. develop and adopt public health information system as needed to support public health policies, programmes and inventions;
5. assist in the development and adoption of appropriate information technology in public health; and
6. apply techniques and frameworks to interrogate and evaluate public health information systems.

Course Contents

Development, implementation and evaluation of public health information systems, and application of information technology to public health practice, research and learning. Introduction of public health disease surveillance systems (including their interaction with electronic health records), public health practice support systems, public health disaster and emergency systems, health consumers' informatics for disease self-management and prevention.

ITH 508: System Administration and Management in Healthcare (2 Units C: LH 30)

Learning Outcomes

At the end of the course, students should be able to:

1. explain the fundamental principles of database, operating systems, and server administration to recommend functional solutions suitable in a range of small-scale operations;
2. develop basic server administration and maintenance skills to effectively manage a stable, small-scale networked environment; and
3. configure the functionality of simple, multi-component real-life network infrastructures to achieve effective communications in a variety of contexts.



Course Contents

Content management, content deployment (file system planning and structure), server administration and management, user and group management, backup management, security management, disaster recovery, resource management, automation management (automatic job scheduling), site management notebooks and documents, system support, user support and education; administrative domains – web domain, network domain, database domain, operating systems domain, and support domain; secure installation; removing unnecessary components; file system maintenance (isolation of sensitive data); user restrictions (access and authorisations); user/group/file management; password standards and requirements; shutting down unnecessary/unneeded services; closing unnecessary/unneeded ports; patch management/software updates; virtualisation; vulnerability scanning.

Minimum Academic Standards

Equipment

Software Laboratory

| SN | Name of Equipment | Quantity |
|----|--|----------|
| 1 | Computer System (with latest specifications) | 20 |
| 2 | Software (Page Maker Professional (Latest Version), Corel Draw, Adobe Photoshop, Adobe Dreamweaver, Ms Office 2007 Professional or latest version(20 user license), Antivirus Software (20 user License), Matlab | 1 |
| 3 | Turbo C , Java, Python, VB Dot Net, C++, Visual Studio 6.0 Compiler(Latest Version) | 1 |
| 4 | Projector | 2 |
| 5 | LaserJet Printer | 2 |
| 6 | Scanner | 1 |
| 7 | Web Camera | |
| 8 | Fire Extinguisher | 2 |
| 9 | Sand Pocket | 4 |
| 10 | Furniture | |

Data comm. & Networking Laboratory

| SN | Name of equipment | Quantity |
|----|---|----------|
| 1. | Computer System with latest Specifications | 10 |
| 2. | 19" Rack | 1 |
| 3. | 24 port Switch | 2 |
| 4. | Windows 2003 Server or Latest version (10 user License) | 1 |
| 5. | Red hat Linux (20 user License) | 1 |
| 6. | Data Backup utility Software | 1 |
| 7. | Data Communication Trainer Board | 2 |
| 8. | LAN Trainer System | 1 |
| 9. | Amplitude Modulation/Demodulation Trainer Board | 5 |



| | | |
|-----|--|--|
| 10. | Frequency Modulation/Demodulation Trainer Board | 5 |
| 11 | Pulse Code Modulation/Demodulation Trainer Board | 5 |
| 12. | CRO 25 MHz.(At least) | 2 |
| 13. | Trainer Board to study Frequency Division Multiplexing/ Demultiplexing | 5 |
| 14. | Trainer Board to study Time Division Multiplexing/ Demultiplexing | 5 |
| 15. | Digital Multimeter | 2 |
| 16. | Wireless access points | 2 |
| 17. | Wi-Fi LAN Cards | 10 |
| 18 | Network/Bandwidth management Software (Cybernetra or Equivalent) | 1 (User License as required should be purchased) |
| 19. | Trainer Board to study Working of MODEM | 1 |
| 20. | LAN Cable tester | 2 |
| 21. | Crimping tool | 5 |
| 22. | Display Boards of various types of cables & connectors used in Computer networks | 2 |
| 23. | Tool kits | 2 |

Digital Laboratory

| SN | Name of Equipment | Quantity |
|----|---|----------|
| 1 | Familiarisation of ICs trainer (7400),(7402), (7432), (7486), (7408), (7404), (7483), (7485), (74157), (74151), (74138) | 5 |
| 2 | EX-ORAND EX-NOR Gates realisation kit (Using NAND OR NOR Gates) | 5 |
| 3 | Realisation of Truth Table for OR AND NAND Gates using NAND Gates and NOR Gate | 5 |
| 4 | 8 bit digital multiplexer | 5 |
| 5 | 1:8 line de-multiplexer | 5 |
| 6 | Multiplex two BCD numbers to seven segment display | 5 |
| 7 | Study of Flip Flop or RS, D,J-K &T | 5 |
| 8 | 3 bit asynchronous up-counter3 bit synchronous down counter | 5 |
| 9 | Universal Shift Registers having SISO, SIPO, PIPO, PISO | 5 |
| 10 | Study of D-latch & D flip flop trainer | 5 |



| | | |
|----|---|---|
| 11 | Encoder/Decoder trainer | 5 |
| 12 | Digital IC Testers | 2 |
| 13 | Digital Lab. With modules | 5 |
| 14 | Logic Probe | 5 |
| 15 | Logic Pulser | 5 |
| 16 | Pulse Generator upto (3MHz) | 5 |
| 17 | Digital Frequency Meter | 5 |
| 18 | Digital IC Programmer | 5 |
| 19 | Digital IC Power Supplies (+/- 5V/1A, +/-12V/1A/+ 15V, 1A) | 5 |

Hardware Laboratory

| SN | Name of Equipment | Quantity |
|-----|---|------------|
| 1. | Trainer Board to demonstrate Assembling and Working of Multimedia Computer System | 2 |
| 2. | Trainer Boards to Study Mother Boards with different chipsets and processors. | 2 each |
| 3. | Hard disk Trainer board (SATA and IDE) | 2 each |
| 4. | CDROM Trainer Board | 2 |
| 5. | Mouse Trainer Board | 2 |
| 6. | Keyboard Trainer Board | 2 |
| 7. | Trainer Board to study construction and working of color CRT Monitor | 2 |
| 8 | Trainer Board to study construction and working of color LCD Monitor | 2 |
| 9. | Trainer Board to study working of Inkjet printer & Colour Laser printer | 1 each |
| 10. | Trainer board to study Switch mode power supply | 5 |
| 11. | Trainer board to study working of UPS | 1 |
| 12. | Trainer board to study construction and working of floppy disk drive | 2 |
| 13. | Computer Repair & Assembly Tool kits | 5 |
| 14. | Computer System with latest specification | 5 |
| 15. | Online UPS(3 KVA) | 1 |
| 16. | PC tools | 1 |
| 17. | Antivirus (5 users) | 1 |
| 18. | USB Hard disk | 2 |
| 19. | Blower | 2 |
| 20. | Tester, Screw Driver and Power Supply tester | 2 set each |

Staffing Academic Staff



1. Academic staff in the Department of Information Technology and Health Informatics shall be those with higher degrees, preferably in Computing related Programmes.
2. The minimum ratio of academic staff to students in the ITH programme shall be 1:10.
3. The programme should have at least 70% of its total academic staff possessing PhD degree or relevant postgraduate professional qualifications.
4. No Lecturer will be promoted to the rank of Senior Lecturer without a PhD degree.
5. There should be availability of adequately qualified lecturers with minimum of eight academic staff (at least 2 at Professorial Level, 3 Senior Lecturers and 3 at Lecturer 1 and below).

Non-academic staff

There shall be technical and administrative staff support for ITH programme, with the following:

1. At least two Technologists to assist in the laboratories.
2. A Confidential Secretary
3. Secretarial staff
4. Office support staff

Library

1. There shall be a Department of Information Technology and Health Informatics-based hybrid of physical and virtual library with modern information communication technology facilities for electronic access and retrieval of information.
2. Additionally, the Faculty/College/University Library shall have a dedicated section or floor with adequate provision of current books and journals, periodicals and bibliographic indices on ITH.

Classrooms, Laboratories and Office spaces

Classroom

The standard requirement of 0.65m² per full-time student should be maintained. Thus the minimum total space requirement for a faculty or department shall be the product of its total full time equivalent student enrolment (FTE) and the minimum space requirement per full-time equivalent i.e. (FTE) 0.65m².

Office

In this respect, each academic staff should have an office space of at least 25 square metres taking into cognisance the status/cadre of the staff

In addition, there should be for the Faculty, a Dean's office and for each Department a Head of Department's office with attached offices for their supporting staff as specified below in m²:

| | | |
|----------------------------------|---|-------|
| Professor's office | - | 18.50 |
| Head of Department's office | - | 18.50 |
| Tutorial teaching staff's office | - | 13.50 |
| Other teaching staff space | - | 7.00 |
| Technical staff space | - | 7.00 |
| Secretarial space | - | 7.00 |
| Staff research laboratory | - | 16.50 |
| Seminar Space/per student | - | 1.85 |
| Laboratory space (per student) | - | 7.50 |



The University shall ensure the provision of adequate human, physical, equipment and library facilities in all the learning areas with strong information communication technology infrastructure for the implementation of these minimum standards.

The University shall provide purpose-built Information Technology and Health Informatics building structure and necessary facilities with adequate and appropriate equipment similar to real-life situation to facilitate effective teaching and learning of the different areas of this curriculum, with adequate maintenance back-up.



B.MLS. Medical Laboratory Science

Overview

The Medical Laboratory Science (MLS) programme has over the years transited from a 4-year Bachelor of Science (B.Sc.) to a 5-year Bachelor of Medical Laboratory Science (B.MLS) honours degree offered in many public and private Universities in Nigeria. This was necessitated by some inadequacies observed in the training curriculum and the need to build capacity at the undergraduate level to cater for advances in modern diagnostics and disease dynamics.

Philosophy

The broad philosophy of training in medical laboratory sciences are to Provide sound academic and professional background for the production of Medical Laboratory Scientists who would be capable of working anywhere in Nigeria. It is also aimed at producing Medical Laboratory Scientists who would satisfy internationally recognisable standards and who could undertake further training towards specialisation and Medical Laboratory Scientists with sufficient management ability to play a leadership role and entrepreneurship in employing others, establishing self, and also in training and general practice of laboratory sciences.

Objectives

The objectives of the bachelor honours degree programme in Medical laboratory sciences are to:

1. provide sound academic and professional background for the production of Medical Laboratory Scientists who would be capable of working anywhere in Nigeria;
2. instil in students a sense of enthusiasm for the profession; an appreciation of its application in different contexts (in areas such as general medicine, food and beverages, pharmaceutical industries, utility departments such as water corporations; research institutions and many others);
3. involve the students in an intellectually stimulating and satisfying experience of learning, studying and research;
4. provide students with a broad and balanced foundation of medical laboratory knowledge and practical skills; performing effectively in clinical diagnostic services, academics and quality assurance; and function independently or in collaboration with other members of the health team in the care of individuals and groups at all levels of health care;
5. develop in students, the ability to apply their medical laboratory knowledge and skills to the solution of theoretical and practical problems in laboratory medicine;
6. develop in students through an education in medical laboratory sciences, a range of transferable skills of value in medical and non-medical employment;
7. provide students with a knowledge and skills base from which they can proceed to further studies in specialised areas involving medical sciences;
8. To generate in students, an appreciation of the importance of medical laboratory sciences in an industrial, economic, environmental, health and social context;
9. generate students with the ability to produce biological and diagnostic reagents as well as being able to fabricate and maintain laboratory equipment; and
10. empower graduates of Medical Laboratory Sciences with skills that will enable them engage in income yielding ventures.



Unique Features of the Programme

1. The BMLS curriculum aims at training a Medical Laboratory Scientist with an area of specialisation in the subject area thus graduating with quasi specialisation at the first degree level.
2. Final year BMLS students specialising in the 6 core departmental areas of Medical Laboratory Science take different parallel courses.

Employability Skills

1. Skills in safe handling of laboratory materials, taking into account specific and potential hazards
2. Skills required for the conduct of standard laboratory procedures involved in analytical and diagnostic work
3. Competence in planning, design and execution of practical investigation from the problem recognition stage through to the evaluation and appraisal of results and findings - i.e. also including the ability to select appropriate techniques and procedures
4. Skills to operate standard laboratory instrumentation such as that used for laboratory investigations
5. Ability to interpret data derived from laboratory investigations in terms of their significance
6. Ability to conduct risk assessments concerning some laboratory reagents and procedures

21st Century Skills

1. Collaboration and team work
2. Creativity and imagination
3. Critical thinking
4. Problem solving
5. Flexibility and adaptability
6. Information Literacy
7. Leadership
8. Civic literacy and citizenship
9. Social responsibility
10. Technology literacy
11. Initiative

Admission and Graduation Requirements

The modes of entry are UTME and Direct Entry. To be admitted into the B.MLS programme the candidate must meet these entry requirements.

Admission Requirements

The B.MLS degree programme shall run for 5 years for Unified Tertiary Matriculation Examination entry candidates and 4 years for Direct Entry candidates.

Five-Year Degree Programme:

In addition to appropriate UTME scores, five Senior Secondary Certificate (SSC) (or its equivalent) credit passes including Mathematics, Physics, Chemistry, Biology and English Language in not more than two sittings.



Direct Entry (DE)

Candidates of Allied Health Science disciplines with BSc in Biochemistry, Anatomy, Physiology, Microbiology, Zoology, and candidates with GCE 'A' level with minimum of credit passes in Biology, Chemistry and Physics in addition to the above Senior Secondary Certificate (SSC) credit passes, may enter the Programme at 200 Level. Holders of Medical Laboratory Technician (MLT) certificate of the Medical Laboratory Science Council of Nigeria who have at least five Senior Secondary Certificate credit passes in Physics, Chemistry, Biology, Mathematics and English Language (WAEC, NECO and NABTEB) at no more than 2 sittings are eligible for direct entry at 200 level. The medical laboratory technician already has an appropriate academic knowledge and skill in Medical Laboratory Science.

The B.MLS degree programme shall run for 5 years for UTME entry candidates and 4 years for Direct Entry candidates. The pass mark for core courses is 50%. The degree is a unclassified degree.

Global Course Structure

Preamble

Courses shall be provided leading to the degree of Bachelor of Medical Laboratory Sciences which may be awarded to students who have successfully fulfilled all academic requirements. The training shall be a combination of teacher-directed, tutor-guided, self-learning and problem-based methods.

100 Level

| Course Code | Course Title | Unit(s) | Status | LH | PH |
|-------------|-----------------------------------|-----------|--------|----|----|
| GST 111 | Communication in English | 2 | C | 15 | 45 |
| GST 112 | Nigerian People and Culture | 2 | C | 30 | |
| BIO 101 | General Biology I | 2 | C | 30 | - |
| BIO 102 | General Biology II | 2 | C | 30 | - |
| BIO 107 | General Biology Practical I | 1 | C | - | 45 |
| BIO 108 | General Biology Practical II | 1 | C | - | 45 |
| CHM 101 | General Chemistry I | 2 | C | 30 | - |
| CHM 102 | General Chemistry II | 2 | C | 30 | - |
| CHM 107 | General Chemistry Practical I | 1 | C | - | 45 |
| CHM 108 | General Chemistry Practical II | 1 | C | - | 45 |
| COS 101 | Introduction to Computing Science | 3 | C | 30 | 45 |
| PHY 101 | General Physics I | 2 | C | 30 | - |
| PHY 102 | General Physics II | 2 | C | 30 | - |
| PHY 107 | General Physics Practical I | 1 | C | - | 45 |
| PHY 108 | General Physics Practical II | 1 | C | - | 45 |
| | Total | 25 | | | |



200 Level

| Course Code | Course Title | Unit(s) | Status | LH | PH |
|--------------------|---|----------------|---------------|-----------|-----------|
| GST 212 | Philosophy, Logic and Human Existence | 2 | C | 30 | - |
| ENT 211 | Entrepreneurship and Innovation | 2 | C | 30 | - |
| ANA 203 | General and Systemic Embryology | 2 | C | 30 | - |
| BCH 201 | General Biochemistry I | 2 | C | 30 | - |
| BCH 203 | General Biochemistry Practical | 1 | C | - | 45 |
| ANA202 | Histology of Basic Tissues | 2 | C | 15 | 45 |
| MCB 201 | Introduction to General Microbiology | 2 | C | 30 | - |
| MLS 201 | Introduction to Medical Laboratory Science | 2 | C | 15 | 45 |
| PIO 201 | Introductory Physiology and Blood | 2 | C | 30 | - |
| PIO 203 | Physiology of Excitable Tissues | 2 | C | 30 | - |
| ANA 201 | Anatomy of Upper and Lower Limb | 2 | C | 15 | 45 |
| BCH 202 | General Biochemistry II | 2 | C | 30 | - |
| PIO 214 | Introduction to Cardiovascular and Respiratory Physiology | 2 | C | 15 | - |
| PIO 216 | Gastrointestinal Physiology | 2 | C | 15 | 45 |
| STA 201 | Biostatistics | 2 | C | 30 | - |
| | Total | 29 | | | |

300 Level

| Course Code | Course Title | Unit(s) | Status | LH | PH |
|--------------------|---|----------------|---------------|-----------|-----------|
| GST 312 | Peace and Conflict Resolution | 2 | C | 30 | - |
| ENT 312 | Venture Creation | 2 | C | 15 | 45 |
| MLS 302 | Basic Haematology | 2 | C | 15 | 45 |
| MLS 303 | Basic Microbiology | 2 | C | 15 | 45 |
| MLS 304 | Basic Histopathology | 2 | C | 15 | 45 |
| MLS 301 | Basic Clinical Chemistry | 2 | C | 15 | 45 |
| MLS 307 | Practical Exercise I | 2 | C | 15 | 45 |
| MLS 305 | Basic Immunology | 2 | C | 15 | 45 |
| MLS 306 | Laboratory Posting I | 2 | C | 15 | 45 |
| MLS 308 | Fundamentals of blood group serology | 2 | C | 15 | 45 |
| MLS 309 | Basic Medical Parasitology and entomology | 2 | C | 15 | 45 |
| MLS 310 | Biomedical Engineering | 2 | C | 15 | 45 |
| PHA 301 | Basic Pharmacology & Toxicology | 2 | C | 15 | 45 |
| BCH 304 | Chemistry and Metabolism of Amino acids | 2 | C | 30 | - |
| | Total | 28 | | | |



400 Level

| Course Code | Course Title | Unit(s) | Status | LH | PH |
|--------------------|--|----------------|---------------|-----------|-----------|
| MLS 402 | Medical Laboratory Haematology | 2 | C | 15 | 45 |
| MLS 403 | Medical Laboratory Histopathology I | 2 | C | 15 | 45 |
| MLS 404 | Medical Laboratory Microbiology I | 2 | C | 15 | 45 |
| MLS 405 | Lab Instrumentation & Techniques | 2 | C | 15 | 45 |
| MLS 407 | Practical Exercise II | 2 | C | 15 | 45 |
| MLS 410 | Clinical Chemistry I | 2 | C | 15 | 45 |
| MLS 408 | Laboratory Posting II | 2 | C | 15 | 45 |
| MLS 411 | Blood Group Serology | 2 | C | 15 | 45 |
| MLS 412 | Professional Ethics in Med Lab Science | 2 | C | 15 | 45 |
| MLS 406 | Research Methodology | 2 | C | 15 | 45 |
| MLS 401 | Laboratory Management and Function, Laboratory practice | 2 | C | 15 | 45 |
| | Total | 22 | | | |

500 Level

| Course Code | Course Title | Unit(s) | Status | LH | PH |
|--------------------|--------------------------------------|----------------|---------------|-----------|-----------|
| MLS 503 | Practical Exercises III | 2 | C | - | 90 |
| MLS 505 | Seminar | 2 | C | - | - |
| MLS 508 | Clinical Chemistry II | 2 | C | 15 | 45 |
| MLS 510 | Medical Laboratory Haematology II | 2 | C | 15 | 45 |
| MLS 512 | Medical Laboratory Histopathology II | 2 | C | 15 | 45 |
| MLS 514 | Medical Laboratory Microbiology II | 2 | C | 15 | 45 |
| MLS 502 | Laboratory Posting III | 2 | C | 15 | 45 |
| MLS 504 | Research Project | 6 | C | - | 270 |
| | Total | 20 | | | |



Course Contents and Learning Outcomes

GST 111: Communication in English

(2 Units C: LH 15; PH 45)

Learning Outcomes

At the end of this course, students should be able to:

1. identify possible sound patterns in English Language;
2. list notable Language skills;
3. classify word formation processes;
4. construct simple and fairly complex sentences in English;
5. apply logical and critical reasoning skills for meaningful presentations;
6. demonstrate an appreciable level of the art of public speaking and listening; and
7. write simple and technical reports.

Course Contents

Sound patterns in English Language (vowels and consonants, phonetics and phonology). English word classes (lexical and grammatical words, definitions, forms, functions, usages, collocations). Sentence in English (types: structural and functional, simple and complex). Grammar and Usage (tense, mood, modality and concord, aspects of language use in everyday life). Logical and Critical Thinking and Reasoning Methods (Logic and Syllogism, Inductive and Deductive Argument and Reasoning Methods, Analogy, Generalisation and Explanations). Ethical considerations, Copyright Rules and Infringements. Writing Activities: (Pre-writing, Writing, Post writing, Editing and Proofreading; Brainstorming, outlining, Paragraphing, Types of writing, Summary, Essays, Letter, Curriculum Vitae, Report writing, Note making and many others. Mechanics of writing). Comprehension Strategies: (Reading and types of Reading, Comprehension Skills, 3RsQ). Information and Communication Technology in modern Language Learning. Language skills for effective communication. Major word formation processes. Writing and reading comprehension strategies. Logical and critical reasoning for meaningful presentations. Art of public speaking and listening.

GST 112: Nigerian Peoples and Culture

(2 Units C: LH 30)

Learning Outcomes

At the end of the course, students should be able to:

1. analyse the historical foundation of the Nigerian culture and arts in pre-colonial times;
2. list and identify the major linguistic groups in Nigeria;
3. explain the gradual evolution of Nigeria as a political unit;
4. analyse the concepts of Trade, Economic and Self-reliance status of the Nigerian peoples towards national development;
5. enumerate the challenges of the Nigerian State towards Nation building;
6. analyse the role of the Judiciary in upholding people's fundamental rights;
7. identify acceptable norms and values of the major ethnic groups in Nigeria; and
8. list and suggest possible solutions to identifiable Nigerian environmental, moral and value problems.



Course Contents

Nigerian history, culture and art up to 1800 (Yoruba, Hausa and Igbo peoples and culture; peoples and culture of the ethnic minority groups). Nigeria under colonial rule (advent of colonial rule in Nigeria; Colonial administration of Nigeria). Evolution of Nigeria as a political unit (amalgamation of Nigeria in 1914; formation of political parties in Nigeria; Nationalist movement and struggle for independence). Nigeria and challenges of nation building (military intervention in Nigerian politics; Nigerian Civil War). Concept of trade and economics of self-reliance (indigenous trade and market system; indigenous apprenticeship system among Nigeria people; trade, skill acquisition and self-reliance). Social justices and national development (law definition and classification. Judiciary and fundamental rights. Individual, norms and values (basic Nigeria norms and values, patterns of citizenship acquisition; citizenship and civic responsibilities; indigenous languages, usage and development; negative attitudes and conducts. Cultism, kidnapping and other related social vices). Re-orientation, moral and national values (The 3R's – Reconstruction, Rehabilitation and Re-orientation; Re-orientation Strategies: Operation Feed the Nation (OFN), Green Revolution, Austerity Measures, War Against Indiscipline (WAI), War Against Indiscipline and Corruption(WAIC), Mass Mobilisation for Self-Reliance, Social Justice and Economic Recovery (MAMSER), National Orientation Agency (NOA). Current socio-political and cultural developments in Nigeria.

BIO 101: General Biology I

(2 Units C: LH 30)

Learning Outcomes

At the end of lectures, students should be able to:

1. explain cell's structure and organisations;
2. summarise functions of cellular organelle;
3. characterise living organisms and state their general reproduction;
4. describe the interrelationship that exists between organisms;
5. discuss the concept of heredity and evolution; and
6. enumerate habitat types and their characteristics.

Course Contents

Cell structure and organisation. functions of cellular organelles. characteristics and classification of living things. chromosomes, genes their relationships and importance. General reproduction. Interrelationships of organisms (competitions, parasitism, predation, symbiosis, commensalisms, mutualism, saprophytism). Heredity and evolution (introduction to Darwinism and Lamarckism, Mendelian laws, explanation of key genetic terms). Elements of ecology and types of habitat.

BIO 102: General Biology II

(2 Units C: LH 30)

Learning Outcomes

At the end of the lectures, students should be able to:

1. List the characteristics, methods of identification and classification of Viruses, bacteria and fungi;
2. state the unique characteristics of plant and animal kingdoms;
3. describe ecological adaptations in the plant and animal kingdoms;
4. explain nutrition, respiration, excretion and reproduction in plants and animals; and
5. describe growth and development in plants and animals.



Course Contents

Basic characteristics, identification and classification of viruses, bacteria and fungi. A generalised survey of the plant and animal kingdoms based mainly on the study of similarities and differences in the external features. Ecological adaptations. Briefs on physiology to include nutrition, respiration, circulatory systems, excretion, reproduction, growth and development.

BIO 107: General Biology Practical I

(1 Unit C: PH 45)

Learning Outcomes

At the end of the course, students should be able to:

1. outline common laboratory hazards;
2. provide precautions on laboratory hazards;
3. state the functions of the different parts of microscope;
4. use the microscope and describe its maintenance;
5. draw biological diagrams and illustrations; and
6. apply scaling and proportion to biological diagrams.

Course Contents

Common laboratory hazards: prevention and first aid. Measurements in biology. Uses and care of microscope. Compound and dissecting microscope. Biological drawings and illustration, scaling, accuracy and proportion; use of common laboratory apparatus and laboratory experiments designed to illustrate the topics covered in BIO 101.

BIO 108: General Biology Practical II

(1 Unit C: PH 45)

Learning Outcomes

At the end of the course, students should be able to:

1. describe the anatomy of flowering plants;
2. differentiate types of fruit and seeds;
3. state ways of handling and caring for biological wares;
4. describe the basic histology of animal tissues; and
5. identify various groups in the animal kingdom.

Course Contents

Anatomy of flowering plants, primary vegetative body: stem, leaf and root to show the mature tissues namely parenchyma, collenchyma, sclerenchyma, xylem and phloem. Types of fruits and seeds. Care and use of dissecting kits and other biological wares. Dissection and general histology of animal tissues based on vertebrate forms. Morphology and functions of epithelial, muscular, nervous and connective tissues. Examination of various groups of lower invertebrates under microscopes, identification of various groups of organisms in Animal Kingdom. And any experiment designed to emphasise the practical aspects of topics in BIO 102.



CHM 101: General Chemistry I

(2 Units C: LH 30)

Learning Outcomes

At the end of this course, the students should be able to:

1. define atom, molecules and chemical reactions;
2. discuss the Modern electronic theory of atoms;
3. write electronic configurations of elements on the periodic table;
4. rationalise the trends of atomic radii, ionization energies, electronegativity of the elements based on their position in the periodic table;
5. identify and balance oxidation – reduction equation and solve redox titration problems.
6. draw shapes of simple molecules and hybridized orbitals;
7. identify the characteristics of acids, bases and salts, and solve problems based on their quantitative relationship;
8. apply the principles of equilibrium to aqueous systems using Le Chatelier's principle to predict the effect of concentration, pressure and temperature changes on equilibrium mixtures;
9. analyse and perform calculations with the thermodynamic functions, enthalpy, entropy and free energy; and
10. determine rates of reactions and its dependence on concentration, time and temperature.

Course Contents

Atoms, molecules and chemical reactions. Modern electronic theory of atoms. Electronic configuration, periodicity and building up of the periodic table. Hybridization and shapes of simple molecules. Valence Forces. Structure of solids. Chemical equations and stoichiometry. Chemical bonding and intermolecular forces. Kinetic theory of matter. Elementary thermochemistry. Rates of reaction. Equilibrium and thermodynamics. Acids, bases and salts. Properties of gases. Redox reactions and introduction to electrochemistry. Radioactivity.

CHM 102: General Chemistry II

(2 Units C: LH 30)

Learning Outcomes

At the end of this course, the students should be able to:

1. state the importance and development of organic chemistry;
2. define fullerenes and its applications;
3. discuss electronic theory;
4. determine the qualitative and quantitative of structures in organic chemistry;
5. describe rules guiding nomenclature and functional group classes of organic chemistry;
6. determine rate of reaction to predict mechanisms of reactions;
7. identify classes of organic functional group with brief description of their chemistry;
8. discuss comparative chemistry of group 1A, IIA and IVA elements; and
9. describe basic properties of Transition metals.



Course Contents

Historical survey of the development and importance of Organic Chemistry. Fullerenes as fourth allotrope of carbon, uses as nanotubules, nanostructures, nanochemistry. Electronic theory in organic chemistry. Isolation and purification of organic compounds. Determination of structures of organic compounds including qualitative and quantitative analysis in organic chemistry. Nomenclature and functional group classes of organic compounds. Introductory reaction mechanism and kinetics. Stereochemistry. The chemistry of alkanes, alkenes, alkynes, alcohols, ethers, amines, alkyl halides, nitriles, aldehydes, ketones, carboxylic acids and derivatives. The Chemistry of selected metals and non-metals. Comparative chemistry of group IA, IIA and IVA elements. Introduction to transition metal chemistry.

CHM 107: General Chemistry Practical I

(1 Unit C: PH 45)

Learning Outcomes

At the end of the course the students should be able to:

1. state the general laboratory rules and safety procedures;
2. collect scientific data and correctly carrying out Chemical experiments;
3. identify the basic glassware and equipment in the laboratory;
4. state the differences between primary and secondary standards;
5. perform redox titration;
6. recording observations and measurements in the laboratory notebooks; and
7. analyse the data to arrive at scientific conclusions.

Course Contents

Laboratory experiments designed to reflect topics presented in courses CHM 101 and CHM 102. These include acid-base titrations, qualitative analysis, redox reactions, gravimetric analysis, data analysis and presentation.

CHM 108: General Chemistry Practical II

(1 Unit C: PH 45)

Learning Outcomes

At the end of this course, the students should be able to:

1. identify the general laboratory rules and safety procedures;
2. collect scientific data and correctly carrying out Chemical experiments;
3. identify the basic glassware and equipment in the laboratory;
4. identify and carry out preliminary tests which includes ignition, boiling point, melting point, test on known and unknown organic compounds;
5. perform solubility tests on known and unknown organic compounds;
6. conduct elemental tests on known and unknown compounds; and
7. conduct functional group/confirmatory test on known and unknown compounds which could be acidic / basic / neutral organic compounds.

Course Contents

Continuation of CHM 107. Additional laboratory experiments to include functional group analysis, quantitative analysis using volumetric methods.



COS 101: Introduction to Computing Sciences

(3 Units C: LH 30; PH 45)

Learning Outcomes

At the end of the course, students should be able to:

1. explain basic components of computers and other computing devices;
2. describe the various applications of computers;
3. explain information processing and its roles in the society;
4. describe the Internet, its various applications and its impact;
5. explain the different areas of the computing discipline and its specialisations; and
6. demonstrate practical skills on using computers and the internet.

Course Contents

Brief history of computing. Description of the basic components of a computer/computing device. Input/Output devices and peripherals. Hardware, software and human ware. Diverse and growing computer/digital applications. Information processing and its roles in society. The Internet, its applications and its impact on the world today. The different areas/programs of the computing discipline. The job specialisations for computing professionals. The future of computing.

Lab Work: Practical demonstration of the basic parts of a computer. Illustration of different operating systems of different computing devices including desktops, laptops, tablets, smart boards and smart phones. Demonstration of commonly used applications such as word processors, spreadsheets, presentation software and graphics. Illustration of input and output devices including printers, scanners, projectors and smartboards. Practical demonstration of the Internet and its various applications. Illustration of browsers and search engines. How to access online resources.

PHY 101: General Physics I (Mechanics)

(2 Units C: LH 30)

Learning Outcomes

At the end of the course, student should be able to;

1. identify and deduce the physical quantities and their units;
2. differentiate between vectors and scalars;
3. describe and evaluate motion of systems on the basis of the fundamental laws of mechanics;
4. apply Newton's laws to describe and solve simple problems of motion;
5. evaluate work, energy, velocity, momentum, acceleration, and torque of moving or rotating objects;
6. explain and apply the principles of conservation of energy, linear and angular momentum;
7. describe the laws governing motion under gravity; and
8. explain motion under gravity and quantitatively determine behaviour of objects moving under gravity.



Course Contents

Space and time. Units and dimension, Vectors and Scalars. Differentiation of vectors: displacement, velocity and acceleration. Kinematics. Newton laws of motion (Inertial frames, Impulse, force and action at a distance, momentum conservation). Relative motion. Application of Newtonian mechanics. Equations of motion. Conservation principles in physics. Conservative forces. Conservation of linear momentum. Kinetic energy and work. Potential energy. System of particles. Centre of mass. Rotational motion: Torque, vector product, moment, rotation of coordinate axes and angular momentum. Polar coordinates. Conservation of angular momentum. Circular motion. Moments of inertia. gyroscopes and precession. Gravitation: Newton's Law of Gravitation. Kepler's Laws of Planetary Motion. Gravitational Potential Energy. Escape velocity. Satellites motion and orbits.

PHY 102: General Physics II (Electricity & Magnetism)

(2 Units C: LH 30)

Learning Outcomes

At the end of this course, the student should be able to:

1. describe the electric field and potential, and related concepts, for stationary charges;
2. calculate electrostatic properties of simple charge distributions using Coulomb's law, Gauss's law and electric potential;
3. describe and determine the magnetic field for steady and moving charges;
4. determine the magnetic properties of simple current distributions using Biot-Savart and Ampere's law;
5. describe electromagnetic induction and related concepts, and make calculations using Faraday and Lenz's laws;
6. explain the basic physical of Maxwell's equations in integral form;
7. evaluate DC circuits to determine the electrical parameters; and
8. determine the characteristics of ac voltages and currents in resistors, capacitors, and Inductors.

Course Contents

Forces in nature. Electrostatics; electric charge and its properties, methods of charging. Coulomb's law and superposition. electric field and potential. Gauss's law. Capacitance. Electric dipoles. Energy in electric fields. Conductors and insulators, current, voltage and resistance. Ohm's law and analysis of DC circuits. Magnetic fields. Lorentz force. Biot-Savart and Ampère's laws. magnetic dipoles. Dielectrics. Energy in magnetic fields. Electromotive force. Electromagnetic induction. Self and mutual inductances. Faraday and Lenz's laws. Step up and step-down transformers: Maxwell's equations. Electromagnetic oscillations and waves. AC voltages and currents applied to inductors, capacitors, resistance, and combinations.

PHY 107: General Practical Physics I

(1 Unit C: PH 45)

Learning Outcomes

At the end of the course, the student should be able to;

1. conduct measurements of some physical quantities;
2. make observations of events, collect and tabulate data;
3. identify and evaluate some common experimental errors;
4. plot and analyse graphs; and
5. draw conclusions from numerical and graphical analysis of data.



Course Contents

This introductory course emphasises quantitative measurements. The treatment of measurement errors, and graphical analysis. A variety of experimental techniques should be employed. The experiments include studies of meters, the oscilloscope, mechanical systems, electrical and mechanical resonant systems. Light. Heat. Viscosity and many others, covered in PHY 101 and PHY 102. However, emphasis should be placed on the basic physical techniques for observation, measurements, data collection, analysis and deduction.

PHY 108: General Practical Physics II

(1 Unit C: PH 45)

Learning Outcomes

At the end of this course, the student should be able to:

1. conduct measurements of some physical quantities;
2. make observations of events, collect and tabulate data;
3. identify and evaluate some common experimental errors;
4. plot and analyse graphs;
5. draw conclusions from numerical and graphical analysis of data; and
6. prepare and present practical reports.

Course Contents

This practical course is a continuation of PHY 107 and is intended to be taught during the second semester of the 100 level to cover the practical aspect of the theoretical courses that have been covered with emphasis on quantitative measurements. The treatment of measurement errors, and graphical analysis. However, emphasis should be placed on the basic physical techniques for observation, measurements, data collection, analysis and deduction.

200 Level

GST 212: Philosophy, Logic and Human Existence

(2 Units C: LH 30)

Learning Outcomes

A student who has successfully gone through this course should be able to:

1. enumerate the basic features of philosophy as an academic discipline;
2. identify the main branches of philosophy & the centrality of logic in philosophical discourse;
3. describe the elementary rules of reasoning;
4. distinguish between valid and invalid arguments;
5. think critically and assess arguments in texts, conversations and day-to-day discussions;
6. critically assess the rationality or otherwise of human conduct under different existential conditions;
7. develop the capacity to extrapolate and deploy expertise in logic to other areas of knowledge; and
8. guide his or her actions, using the knowledge and expertise acquired in philosophy and logic.



Course Contents

Scope of philosophy; notions, meanings, branches and problems of philosophy. Logic as an indispensable tool of philosophy. Elements of syllogism, symbolic logic— the first nine rules of inference. Informal fallacies, laws of thought, nature of arguments. Valid and invalid arguments, logic of form and logic of content — deduction, induction and inferences. Creative and critical thinking. Impact of philosophy on human existence. Philosophy and politics, philosophy and human conduct, philosophy and religion, philosophy and human values, philosophy and character molding and many others.

ENT 211: Entrepreneurship and Innovation

(2 Units C: LH 30)

Learning Outcomes

At the end of this course, students should be able to:

1. explain the concepts and theories of entrepreneurship, intrapreneurship, opportunity seeking, new value creation, and risk taking;
2. state the characteristics of an entrepreneur;
3. analyse the importance of micro and small businesses in wealth creation, employment, and financial independence;
4. engage in entrepreneurial thinking;
5. identify key elements in innovation;
6. describe stages in enterprise formation, partnership and networking including business planning;
7. describe contemporary entrepreneurial issues in Nigeria, Africa and the rest of the world; and
8. state the basic principles of e-commerce.

Course Contents

Concept of Entrepreneurship (Entrepreneurship, Intrapreneurship/Corporate Entrepreneurship). Theories, Rationale and relevance of Entrepreneurship (Schumpeterian and other perspectives, Risk-Taking, Necessity and opportunity-based entrepreneurship and Creative destruction). Characteristics of Entrepreneurs (Opportunity seeker, Risk taker, Natural and Nurtured, Problem solver and change agent, Innovator and creative thinker). Entrepreneurial thinking (Critical thinking, Reflective thinking, and Creative thinking). Innovation (Concept of innovation, Dimensions of innovation, Change and innovation, Knowledge and innovation). Enterprise formation, partnership and networking (Basics of Business Plan, Forms of business ownership, Business registration and Forming alliances and joint ventures). Contemporary Entrepreneurship Issues (Knowledge, Skills and Technology, Intellectual property, Virtual office, Networking). Entrepreneurship in Nigeria (Biography of inspirational Entrepreneurs, Youth and women entrepreneurship, Entrepreneurship support institutions, Youth enterprise networks and Environmental and cultural barriers to entrepreneurship). Basic principles of e-commerce.



MCB 201: Introduction to General Microbiology

(2 Units C: LH 30)

Learning Outcomes

At the end of this course, the students should be able to:

1. explain the basic concepts and scope of microbiology;
2. know the scope of microbiology layout of microbiology laboratory equipment and reagents in microbiology; and
3. explain the theory behind basic protocols in a microbiology laboratory.

Course Contents

The Kingdom Protista Organisation differences in eucaryotic cells classification and nomenclature of micro-organisms. Bacterial cell form, structure nutrition reproduction and metabolism. Bacterial genetics. A typical prokaryotic cell Viruses. Encaryotic Micro-organism-fungi microbial control, microbes in food, water and environment. Bacterial infection and virulence. Phagocytosis. Introduction to pathogenic microbiology. Laboratory animals, types breeding and uses.

BCH 201: General Biochemistry I

(2 Units C: LH 30)

Learning Outcomes

At the end of the lectures, students should be able to:

1. explain the structure of different macromolecules in biological system;
2. identify types of chemical reactions involving these macromolecules;
3. explain the various methods of isolation of these macromolecules;
4. estimate the effects of acids and alkalis on the macromolecules;
5. describe purification of macromolecules; and
6. discuss quantification the various macromolecules.

Course Contents

Introductory chemistry of amino acids; their properties, reactions and biological functions. Classification of amino acids: neutral, basic and acidic; polar and non-polar; essential and non-essential amino acids. Peptides. Introductory chemistry and classification of proteins. Biological functions of proteins. Methods of their isolation, purification and identification. Primary, secondary, tertiary and quaternary structures of proteins. Basic principles of tests for proteins and amino acids. Introductory chemistry of carbohydrates, lipids and nucleic acids. Nomenclature of nucleosides, and nucleotides; effects of acid and alkali on hydrolysis of nucleic acids.

BCH 202: General Biochemistry II

(2 Units C: LH 30)

Learning Outcomes

At the end of the course, students should be able to:

1. explain the structure of the cell including its components;
2. discuss the interrelationship between different organelles of the cell;
3. recognise the differences between plant and animal cells;
4. isolate the various organelles of both plant and animal cells; and
5. discuss the influence of hydrogen ion concentration on cellular function.



Course Contents

The cell theory. Structures and functions of major cell components. Cell types, constancy and diversity. Cell organelles of prokaryotes and eukaryotes. Chemical composition of cells. Centrifugation; Methods of cell fractionation. Structure, function and fractionation of extra-cellular organelles. Water, total body water and its distribution. Regulation of water and electrolyte balance. Disorder of water and electrolyte balance. Acidity and alkalinity, pH and pK values and their effects on cellular activities.

BCH 203: General Biochemistry Practical I

(1 Unit C: PH 45)

Learning Outcomes

At the end of this course students should be able to:

1. describe the laboratory experiments designed to reflect the topics covered; and
2. explain the laboratory procedures used in the study of various biochemical processes.

Course Contents

Laboratory experiments designed to reflect the topics covered in BCH 201 and BCH 202. Introduction to laboratory methods and procedures employed in studying biochemical processes.

ANA 202: Histology of Basic Tissues

(2 Units C: LH 15; PH 45)

Learning Outcomes

At the end of this course students should be able to:

1. name common current histological techniques;
2. enumerate the principles, techniques and functional applications of Histology;
3. define and explain the cell in relation to its environment, surface components and content;
4. explain the interrelationship and interdependency between cell structures and functions; and
5. identify the microscopic appearance of tissues such as muscle, cartilage, etc in relation to their staining.

Course Contents

Introduction to histology; Method of study in histology; Cell Membrane, Cellular organelles; Cell dynamics and cell cycle. Cytogenetics. Histochemistry and cytochemistry. Introduction to recombinant DNA; In situ hybridization histochemistry. Cell dynamics and cycle. Basic tissues of the body, the epithelial, connective tissues, muscle and nervous tissue. The microanatomy of the four basic tissues, namely: epithelial tissue, including glandular tissue, connective tissue, muscular tissue, and nervous tissue. Covering and Lining Epithelia. Glandular Epithelia. Connective tissue. Bone, Bone formation and Joints. Blood. Muscle. Nervous tissue (PNS). Nervous tissue (CNS). Cardiovascular system. Respiratory system. Integumentary system. Liver, Gallbladder and Pancreas. Gastro-intestinal system. Lymphatic tissue and the Immune system. Endocrine system. Urinary system. Female reproductive system. Male reproductive system. Eye.



ANA 203: General and Systemic Embryology

(2 Units C: LH 30)

Learning Outcomes

At the end of this course, students should be able to:

1. explain how the embryo is form from the zygote;
2. discuss the role of cleavage and gastrulation in animal development;
3. demonstrate understanding of embryology and significance of prenatal diagnostic methods;
4. describe structural features of primordia in tissue and organs at different developmental stages;
5. define risk periods in histo- and organogenesis; and
6. analyse the most often observed developmental anomalies.

Course Contents

Spermatogenesis, oogenesis; ovarian follicles; ovulation; corpus luteum; menstruation; uterine cycle; hormonal control of uterine cycle; fertilization; cleavage; implantation; reproductive technologies-IVF/surrogacy/embryo transfer; embryo manipulation & potency/twinning; molecular embryology and transgenesis; gastrulation; notochord, neurulation; derivatives of the germ layers; folding of the embryo; fetal membranes; placenta; development of limbs and teratology. Growth and perinatology; congenital malformations – general introduction. The cardiovascular system, skin, structure of the nails and hair. Macrophagic system; cellular immunology; lymphoid organs; glands – endocrine and exocrine. Respiratory system. Digestive system. Urinary and genital systems. Electron micrograph studies of each organ.

ANA 201: Anatomy of Upper and Lower Limb

(2 Units C: LH 15; PH 45)

Learning Outcomes

At the end of this course, students should be able to:

1. define fundamental anatomical terminology and discuss the anatomical position;
2. describe the anatomy of the musculoskeletal system, including the axial skeleton; appendicular skeleton, appendicular and axial muscles, and arthrology;
3. describe the general features of the bones of the upper and lower limbs;
4. identify the major muscles of the upper and lower limbs;
5. explain the types and structure of the joints of the upper and lower limbs;
6. correlate between the attachment of the muscles and their functions on the different joints;
7. identify the major nerves of the upper and lower limbs;
8. describe the functional components of each of the major nerves and its distribution;
9. identify and describe the course of the major superficial veins of the upper and lower limbs; and
10. name the major arteries of the upper and lower limbs.

Course Contents

Descriptive terms, plans and terms of relationship of the human body, terms of comparison, attachment of muscles, types of muscles, movements of joints. Osteology, principles of kinesiology, general organization of body system. Cutaneous innervation of the upper limb; pectoral region; breast; axilla; shoulder region; arm and cubital fossa; flexor compartment of forearm; extensor compartment of forearm; hand; venous and lymphatic drainage of the upper limb. Applied anatomy of nerves; blood supply of the upper limb. Cutaneous innervation of the lower limb; femoral triangle; adductor canal and medial side of the thigh; gluteal region; back of



the thigh, popliteal fossa; extensor compartment of the leg and dorsum of the foot; peroneal and flexor compartment of the leg; sole of the foot, arches of the foot; mechanism of walking; venous and lymphatic drainage of the lower limb; applied anatomy of the nerves and blood supply to the lower limb.

PIO 201: Introductory Physiology and Blood

(2 Units C: LH 30)

Learning Outcomes

At the end of this course, students should be able to:

1. describe the composition of a cell membrane;
2. explain how a potential difference across a membrane will influence the distribution of a cation and an anion;
3. describe how transport rates of certain molecules and ions are accelerated by specific membrane transport proteins;
4. distinguish between active (primary and secondary) transport, facilitated diffusion, and passive diffusion based on energy source and carrier protein involvement;
5. identify the mechanisms and role of selective transporters for amino acids, neurotransmitters, nutrients, etc.;
6. explain the general concepts of homeostasis and the principles of positive and negative feedback in physiological systems;
7. identify the site of erythropoietin production, the stimulus for its release, and the target tissue for erythropoietin action;
8. discuss the normal balance of red blood cell synthesis and destruction, including how imbalances in each lead to anemia or polycythemia;
9. list and differentiate the various types of leukocytes;
10. describe the role of thrombocytes in haemostasis; and
11. list clotting factors and the discuss the mechanism of anti-coagulants.

Course Contents

Introduction and history of physiology. Structure and functions of cell membranes. Transport process. Special transport mechanism in amphibian bladder, kidney, gall bladder, intestine, astrocytes and exocrine glands. Biophysical principles. Homeostasis and control systems including temperature regulation. Biological rhythms. Composition and functions of blood. Haemopoiesis. WBC and differential count. Plasma proteins Coagulation, fibrinolysis and platelet functions. Blood groups –ABO system – Rh system. Blood transfusion – indication for collection and storage of blood, hazards of blood transfusions. Reticulo- endothelial system. Imunity and immodeficiency disease and HIV.

PIO 203: Physiology of Excitable Tissues

(2 Units: C: LH 30)

Learning Outcomes

At the end of this course, students should be able to:

1. list the steps in excitation-contraction coupling in skeletal muscle;
2. describe the structure of the neuromuscular junction;
3. list some intracellular factors that can cause muscle fatigue;
4. describe the distinguishing characteristics of multi-unit and unitary smooth muscles;



5. explain the steps in the excitation-contraction coupling mechanism in cardiac muscle and compare with skeletal muscle including different mechanisms for sarcoplasmic reticulum calcium release;
6. explain how the resting membrane potential is generated
7. state the Nernst equation, and indicate how this equation accounts for both the chemical and electrical driving forces that act on an ion;
8. discuss the mechanisms by which an action potential is propagated along both nonmyelinated and myelinated axons;
9. describe the principle of the voltage clamp and how it is used to identify the ionic selectivity of channels; and
10. discuss the disorders that can occur at the neuromuscular junction.

Course Contents

Structure and classification of muscles, excitation and contraction theories and principles involved in muscles contraction, resting membrane and action potentials. Generation of impulses in excitable tissues. Nerve and neuromuscular transmissions. Simple reflex and spinal reflexes. Spinal cord ascending, descending pathways. Receptors. Thalamus-sensory motor cortex. Control of posture and movement. The reticular activating system, sleep, neural centers regulating Visceral functions. Neurophysiological basis of instinctive behaviour, conditioned reflexes learning, and temperature regulation. Sympathetic and parasympathetic pathways. Role in the various system especially cardiovascular, respiratory and gastro intestinal.

PIO 214: Introduction to Cardiovascular and Respiratory Physiology (2 Units C: LH 30)

Learning Outcomes

At the end of this course, students should be able to:

1. state Starling's law of the heart and describe the application of the law in keeping the output of the left and right ventricles equal;
2. describe how ionic currents contribute to the four phases of the cardiac action potential;
3. explain the ionic mechanism of pacemaker automaticity and rhythmicity, and identify cardiac cells that have pacemaker potential and their spontaneous rate;
4. identify neural and humoral factors that influence their rate;
5. describe the various phases of ventricular systole and ventricular diastole;
6. describe the timing and causes of the four heart sounds;
7. explain why the ECG tracing looks different in each of the 12 leads;
8. explain the principles underlying cardiac output measurements using the Fick principle, dye dilution, and thermodilution methods;
9. list the factors that shift laminar flow to turbulent flow;
10. describe the relationship between velocity, viscosity, and audible events, such as murmurs and bruits;
11. describe how arterial systolic, diastolic, mean, and pulse pressure are affected by changes in a) stroke volume, b) heart rate, c) arterial compliance, and d) total peripheral resistance;
12. define the Starling equation and discuss how each component influences fluid movement across the capillary wall;
13. list the anatomical components of the baroreceptor reflex;
14. explain three positive feedback mechanisms activated during severe hemorrhage that may lead to circulatory collapse and death;



15. define compliance and identify two common clinical conditions in which lung compliance is higher or lower than normal;
16. list the factors that determine total lung capacity, functional residual capacity, and residual volume;
17. define surface tension and describe how it applies to lung mechanics, including the effects of alveolar size and the role of surfactants;
18. explain how the shape of the oxyhemoglobin dissociation curve influences the uptake and delivery of oxygen;
19. list the forms in which carbon dioxide is carried in the blood; and
20. identify the regions in the central nervous system that play important roles in the generation and control of normal respiration.

Course Contents

The heart; events of the cardiac cycle. Control of cardiac contractility. Cardiac electrophysiology. Properties of cardiac muscles. Cardiac output - measurement and control. Haemodynamics of circulation. Arterial blood pressure and its regulation. Cardiovascular reflexes. Peripheral resistance and local control of the circulation. Regional blood flow. Cardiovascular changes in exercise, haemorrhage and shock. Respiratory physiology – functions of upper respiratory tract. Mechanics of respiration including compliance. Surfactant. Lung volume and capacities. Pulmonary gas exchange. Blood gas transport. Pulmonary function tests. Nervous and chemical control of respiration. Response to hypoxia, high altitude, exercise and artificial respiration.

PIO 204: Gastrointestinal Physiology

(2 Units C: LH 30)

Learning Outcomes

At the end of this course students should be able to:

1. compare and contrast the regulation of gut function by nerves, hormones, and paracrine regulators;
2. identify the cell type and anatomical location of the endocrine cells secreting major GI hormones, such as gastrin, secretin, cholecystokinin (CCK), GLP-1, GLP-2, leptin, and motilin;
3. list the physiological functions of the components of saliva;
4. describe the role of HCl in the gastric digestion of carbohydrates and protein, and how pepsinogen is activated;
5. list the mechanisms contributing to gastric mucosal defense and how they can be compromised by drugs or pathogens;
6. list the stimuli that release secretin and CCK and explain the route by which these regulatory peptides stimulate the pancreas;
7. describe the cellular mechanisms for the hepatic uptake, conjugation, and secretion of bile salts and bilirubin;
8. describe the sequential digestion of ingested starch by enzymes of the salivary glands, pancreas, and the intestinal apical membrane;
9. describe the mechanisms and molecules mediating the solubilization and digestion of lipids in the small intestine; and
10. describe the disorders of motility that can lead to gastroparesis, achalasia, diarrhea, constipation, megacolon and irritable bowel syndrome.

Course Contents



Physiologic anatomy of the gastrointestinal tract, Review of smooth muscle function, Secretions in the G.I.T. and their control, Movements of the gastrointestinal tract, Digestion and absorption of various food substances, Physiologic anatomy of the liver and biliary system including their functions, Disorders of G.I.T, The gut as an endocrine organ. Nutrition: energy and other dietary requirements. Basal metabolic rate. Nitrogen balance. Amino acid deficiency. Hormonal control of nutritional needs, vitamins, mineral mechanisms. Food value of local foodstuffs. Diet sheets and nutritional deficiency states.

MLS 201: Introduction to Medical Laboratory Science (2 Units C: LH 15; PH 45)

Learning Outcomes

At the end of this course, students should be able to:

1. define safety awareness for Medical Laboratory Personnel;
2. describe steps used as precautionary measures;
3. select the correct means of disposal of waste generated in the Medical Laboratories;
4. list the types of samples used in the clinical laboratories;
5. identify the preanalytical, pre-collection, collection and post collection variables that can adversely affect laboratory results;
6. list the proper drawing order for collection tubes; and
7. describe the general steps for processing samples.

Course Contents

General introduction to Medical Microbiology, immunology and Histopathology, specimen collection, reception and registration. Safety precaution in Medical Microbiology Immunology and Histopathology Laboratories. Microscopy use and care of the microscope and other equipment sterilisation-principles and techniques. Glassware-care and maintenance. Refrigeration-Principle, uses and care. General introduction to clinical Chemistry, Haematology and Blood Transfusion Sciences. Storage and disposal of specimens. Specimen containers. Safety precaution in the chemical pathology, Haematology and Blood Bank Laboratories. Handling of Laboratory animals.

STA 201: Biostatistics (2 Units C: LH 30)

Learning Outcomes

At the end of this course, students should be able to:

1. explain the scope for statistical methods in health science;
2. define the measures of location partition and dispersion;
3. explain the elements of probability, probability distribution;
4. describe the test for hypotheses concerning population means proportions and variances;
5. compute for regression and correlation as well as conduct some non-parametric tests reference to contingency table analysis; and
6. explain the elements of design of experiments and analysis of variance.



Course Contents

Aims, characteristics and application of biostatistics in clinical and preventive medicine. Statistical data in bio-medical science-samples, population, variables, frequency distribution, vital and descriptive statistics, measurement of central tendencies-mean, median, mode, dispersion and presentation of data probability distribution, Hypothetical tests of statistical significance. Analysis of variance. Regression and correlation. Experimental designs and clinical trials.

300 Level

GST 312: Peace and Conflict Resolution

(2 Units C: LH 30)

Learning Outcomes

At the end of the course, students should be able to:

1. analyse the concepts of peace, conflict and security;
2. list major forms, types and root causes of conflict and violence;
3. differentiate between conflict and terrorism;
4. enumerate security and peace building strategies; and
5. describe roles of international organisations, media and traditional institutions in peace building.

Course Contents

Concepts of Peace, Conflict and Security in a multi-ethnic nation. Types and Theories of Conflicts: Ethnic, Religious, Economic, Geo-political Conflicts; Structural Conflict Theory, Realist Theory of Conflict, Frustration-Aggression Conflict Theory. Root causes of Conflict and Violence in Africa: Indigene and settlers Phenomenon; Boundaries/boarder disputes; Political disputes; Ethnic disputes and rivalries; Economic Inequalities; Social disputes; Nationalist Movements and Agitations; Selected Conflict Case Studies – Tiv-Junkun; ZangoKartaf, Chieftaincy and Land disputes and many others. Peace Building, Management of Conflicts and Security: Peace & Human Development. Approaches to Peace & Conflict Management --- (Religious, Government, Community Leaders and many others.). Elements of Peace Studies and Conflict Resolution: Conflict dynamics assessment Scales: Constructive & Destructive. Justice and Legal framework: Concepts of Social Justice; The Nigeria Legal System. Insurgency and Terrorism. Peace Mediation and Peace Keeping. Peace & Security Council (International, National and Local levels) Agents of Conflict resolution – Conventions, Treaties Community Policing: Evolution and Imperatives. Alternative Dispute Resolution, ADR. Dialogue). Arbitration, c). Negotiation d). Collaboration and many others. Roles of International Organisations in Conflict Resolution. (a). The United Nations, UN and its Conflict Resolution Organs. (b). The African Union & Peace Security Council (c). ECOWAS in Peace Keeping. Mediaand Traditional Institutions in Peace Building. Managing Post-Conflict Situations/Crisis: Refugees. Internally Displaced Persons, IDPs. The role of NGOs in Post-Conflict Situations/Crisis



ENT 312: Venture Creation

(2 Units C: LH 15; PH 45)

Learning Outcomes

At the end of this course, students, through case study and practical approaches, should be able to:

1. describe the key steps in venture creation;
2. spot opportunities in problems and in high potential sectors regardless of geographical location;
3. state how original products, ideas, and concepts are developed;
4. develop business concept for further incubation or pitching for funding;
5. identify key sources of entrepreneurial finance;
6. implement the requirements for establishing and managing micro and small enterprises;
7. conduct entrepreneurial marketing and e-commerce;
8. apply a wide variety of emerging technological solutions to entrepreneurship; and
9. appreciate why ventures fail due to lack of planning and poor implementation.

Course Contents

Opportunity Identification (Sources of business opportunities in Nigeria, Environmental scanning, Demand and supply gap/unmet needs/market gaps/Market Research, Unutilised resources, Social and climate conditions and Technology adoption gap). New business development (business planning, market research). Entrepreneurial Finance (Venture capital, Equity finance, Micro finance, Personal savings, Small business investment organisations and Business plan competition). Entrepreneurial marketing and e-commerce (Principles of marketing, Customer Acquisition & Retention, B2B, C2C and B2C models of e-commerce, First Mover Advantage, E-commerce business models and Successful E-Commerce Companies,). Small Business Management/Family Business: Leadership & Management, Basic book keeping, Nature of family business and Family Business Growth Model. Negotiation and Business communication (Strategy and tactics of negotiation/bargaining, Traditional and modern business communication methods). Opportunity Discovery Demonstrations (Business idea generation presentations, Business idea Contest, Brainstorming sessions, Idea pitching). Technological Solutions (The Concept of Market/Customer Solution, Customer Solution and Emerging Technologies, Business Applications of New Technologies - *Artificial Intelligence (AI)*, *Virtual/Mixed Reality (VR)*, *Internet of Things (IoTs)*, *Blockchain*, *Cloud Computing*, *Renewable Energy* and many others. Digital Business and E-Commerce Strategies).

MLS 301: Basic Clinical Chemistry

(2 Units C: LH 15; PH 45)

Learning Outcomes

At the end of this course, students should be able to:

1. convert results from one unit format to another using si unit system;
2. describe the physiology and biochemistry of the gastric secretion;
3. list the test in urinalysis and microscopy profile;
4. describe how laboratory tests are used in these disorders;
5. discuss the mode of action of hormones in carbohydrate metabolism;
6. discuss the type of lipids;
7. describe the measurement of plasma lipid and lipoproteins;
8. outline the factors affecting synthesis of protein;
9. explain the functions of kidney; and



10. outline the causes of acidosis and alkalosis.

Course Contents

Traditional and S.I units in Clinical Chemistry; Reference values: Gastric function tests; Agents for Gastric stimulation. Ward procedures and Laboratory Investigation of Gastric Secretions. Intestinal function tests; Digestion and absorption; Causes of Malabsorption. Laboratory investigation of malabsorption. Renal function tests; functions of the kidney; Measurement of Renal plasma flow, Glomerular filtration rate – Creatinine clearance, Insulin clearance, Concentration and Dilution Tests; Urinary Acidification Tests, urine specific gravity/Osmolarity Dye Excretion test. Water and Electrolyte metabolism. Acid base balance; Definition and causes of acidosis and alkalosis; Blood buffers. Transport of blood gases; assessment of acid/base status. Lipids; definition and types of lipids; Formation of free fatty acids, ketone bodies and Lactate; Measurement of plasma lipids and lipoproteins. Plasma proteins and physiologic functions; factors affecting synthesis and catabolism. Methods for the determining of total protein in serum. Carbohydrate metabolism: Blood glucose homeostasis; hyperglycaemia diabetes mellitus – its causes and investigation; Hypoglycaemia – types causes and investigation.

MLS 302: Basic Haematology

(2 Units C: LH 15; PH 45)

Learning Outcomes

At the end of this course, students should be able to:

1. discuss the basic concepts of origin, development and functions of blood cells;
2. describe the methods of Haemoglobin estimation;
3. describe the methods of cell counting;
4. state simple tests used in blood coagulation; and
5. explain blood films-normal and abnormal.

Course Contents

Origin, development and functions of blood cells. Synthesis and breakdown of haemoglobin. Methods of Haemoglobin estimation. Methods of cell counting. Absolute values. Introduction to Homeostasis. Principle and mode of action of common anticoagulants. Principle and components of Haematological stains. Simple tests used in blood coagulation. Blood films-normal and abnormal. Practical Classes.

MLS 303: Basic Microbiology

(2 Units C: LH 15; PH 45)

Learning Outcomes

At the end of this course, students should be able to:

1. describe the classification and nomenclature of microorganisms;
2. explain the general properties of bacteria, structure, growth and reproduction requirements;
3. state the general properties, structure and biology of viruses;
4. describe the characteristics and general features of fungi and their diseases; and
5. discuss about identification and demonstration of pathogens in the laboratory.



Course Contents

Scope of microbiology: Historical approach and many others. Classification and nomenclature of microorganisms. Introduction to the microbial world; Introduction to Bacteriology, Mycology, Virology and Parasitology (the protozoan).

Bacteriology: The general properties of bacteria, structure, growth, reproduction, requirements both environmental and nutritional. Aspects of Bacterial metabolism, bacterial genetics and variation. Sterilisation in Microbiology, bacteria in health and disease: Antibiotics and chemotherapy; infection and immunity; introduction to laboratory techniques and methods including serology.

Viruses: General properties, structure and biology of viruses, classification – various methods, reproduction, resistance, pathology, purification of viruses, propagation of viruses, immunity and diagnosis of viral infection, interferon and interference, inclusion bodies, cytopathic effects. Viral-host interactions and identification.

Fungi: Morphology, groups and classification. Types of lesion and types of mycoses, growth requirements. Characteristics and general features of fungi and their diseases. Identification, and demonstration in the laboratory.

MLS 304: Basic Histopathology

(2 Units C: LH 15; PH 45)

Learning Outcomes

At the end of this course, students should be able to:

1. discuss basic concepts of common fixing agents;
2. describe the uses of fixing agents in Histopathology laboratory;
3. explain basic histology of organs;
4. describe tissue sectioning procedures; and
5. conduct slide preparation and slides examination to illustrate normal and abnormal features.

Course Contents

Introduction to Histopathology. Fixation – Autolysis, bacterial decomposition. Effects of fixation, common fixing agents and their uses. Secondary fixation, post-fixation and post-chroming and post-mordanting. Fixation pigments, Decalcification – Aims and applications, decalcifying agents. Tests for clearing of decalcification. Dehydration, clearing and infiltration/embedding. Frozen and celloidin sections. Embedding media. Basic histology of organs. Principles and application of Exfoliate Cytology. Collection and fixation of specimens for cytological examination. Museum technique-colour restoration. Mounting in museum jars. Tissues and cellular injury inflammation. Healing and repairs. Gross appearance of diseased organs in routine post-mortem examination. Slide sections to illustrate common tumours.

MLS 305: Basic Immunology

(2 Units C: LH 15; PH 45)

Learning Outcomes

At the end of this course, students should be able to:

1. explain the basic concepts of immunology;
2. appreciate and explain animal vaccine production; and
3. appreciate and explain human vaccine production.



Course Contents

The Historical background of Immunology. Classification of Immunity. Innate immunity. Development and structure of cells in the Immune System Cellular interaction the expression and regulation of immunity. Acquired Immunity.

MLS 306: Laboratory Posting I

(2 Units C: LH 15; PH 45)

Learning Outcomes

At the end of this course, students should be able to:

1. state hazards encountered in medical laboratories and the safety precautions to be applied to avoid disaster;
2. describe how to set up common laboratory equipment like microscope, autoclave and their application;
3. describe how laboratory specimens are collected and processed; and
4. discuss the basic organisation of a medical laboratory.

Course Contents

Laboratory hazards and precautions. General laboratory glassware and apparatus-composition of glass, cleaning of glassware, standardised glassware, general glassware. Apparatus-autoclave, centrifuge. Production of chemically pure water, elementary microscopy; refraction, refractive index, principal focus of a converging lens, principal focus of a diverging lens, component of a microscope, setting up of a microscope, some do's and do not's of the microscope, micrometry, Dark ground microscope, Fluorescent microscope. Collection and reporting of specimens, ward etiquette, postage of specimen, preparation of specimen containers, swabs, collection of autopsy and biopsy specimens.

MLS 307: Practical Exercise I

(2 Units C: LH 15; PH 45)

The student is expected to carry out practical exercises in all the disciplines:

Clinical Chemistry: Titration: presentation of volumetric analysis. Methods for chloride determination. Determination of bicarbonate in plasma, percentage purity of carbonate. Determination of the composition of the mixture NaOH/Na₂CO₃, NaCl/HCl, specific gravity, reactions with ferric chloride, urobilinogen, bilirubin, indicant, myoglobin, cystine, protein, Bence-Jones protein, blood, reducing substances, ketone bodies, phenyl pyruvic acid. Spectroscopy of plasma and urine CSF analysis – sugar, protein.

Haematology and BGS: Blood film, WBC count, haemoglobin estimation, Absolute values, eosinophil count, reticulocyte count. Osmotic Fragility. Blood grouping techniques, Antiserum titration, Anti-human globulin (AHG) direct and indirect, Antibody screening. Donor screening, secretor status.

Histopathology: Preparation of fixatives, removal of formalin pigments, testing of end point of decalcification using chemical methods. General tissue staining by haematoxylin and counter-staining with eosin. Demonstration of elastic and collagen fibres. Prussian blue reaction for iron in tissues. Gram and Ziehl-Nielsen (Z-N) staining methods. Use of automatic tissue processors. Microtome.

Medical Microbiology and Parasitology: Safety precautions in the Microbiology laboratory. Getting acquainted with basic tools of microbiologist. Preparation of films and basic staining techniques, the Gram stain, Ziehl-Nielsen stain, spores, capsule and negative staining procedures. Wet preparation and microscopy, Motility tests, Media preparation and culturing. Plate reading



Demonstration of the ubiquity of micro-organisms especially bacteria from different environment. Recognition of different types of haemolysis. Sensitivity testing. Use of autoclave. Wet mount for parasites. Identification of trophozoites, cysts and ova of different protozoa and helminths in stool. Thin and thick films preparation for malaria microfilaria and Trypanosome parasites. Staining techniques: Giemsa, Wrights, Fields and Leishman Stains. Identification of *Trichomonas* spp, *Paragonimus* spp, *Trichuris* spp, *Schistosoma* spp, other Helminthes and protozoa of medical importance. Skin snips. Urine microscopy. Concentration techniques for stool and sputum for ova and cysts. Examination and recognition of Helminthes from tissue Biopsy.

MLS 308: Fundamentals of Blood Group Serology

(2 Units C: LH 15; PH 45)

Learning Outcomes

At the end of this course, students should be able to:

1. discuss the components of ABO;
2. explain Rhesus blood group systems;
3. acquire the skill for blood grouping techniques;
4. appreciate the anomalies in ABO grouping;
5. identify the subgroups of ABO system and variants of Rh system; and
6. describe organisational structures of the Blood Bank, facilities and reagents.

Course Contents

ABO and Rhesus Blood Groups, Inheritance, distribution and Genetic Theory. Blood Grouping Techniques – principles, disadvantages and advantages. Preparation of antisera – antiserum titration, avidity, Potency and specificity. Plant lectins –Preparation and Standardisation of antisera from lectins such as *Dolichos biflorus* Anticoagulants used in BGS, ACD, CPD-CPA-A and many others. Modes of Action, Side effects. Blood Bottles (MRC) and Plastic Bags – Advantages and disadvantages. Donor Screening- using CuSO_4 method – other methods of screening. Preparation of blood products – cryoprecipitate, platelet rich plasma, packed cell fresh frozen plasma, fibrinogen and many others. Storage of blood and blood products – various methods, advantages and disadvantages Blood banking-organisation, structures, facilities and records. Blood group specific substances – synthesis, identification method(s) and application. Quality control of physical, chemical and reagent. Practical/tutorials ABO and Rhesus grouping methods, Antiserum Titration DCT and ICT antibody screening.

MLS 309: Basic Medical Parasitology

(2 Units C: LH 30; PH 45)

Learning Outcomes

At the end of this course, students should be able to:

1. explain basic concepts of protozoa;
2. discuss the basic concepts of helminthes of medical importance;
3. describe the methods of demonstration of parasites in clinical samples;
4. discuss the basic concepts of Arthropods of medical importance; and
5. empower students with knowledge vectors of important diseases of man.



Course Contents

Introduction to the parasites. Classification of protozoa, (the amoebas, the ciliates, the flagellates, Nematodes. (*Ascaris*, *Strongyloides*, *Trichuris*, guineaworm, hookworms, *Trichinella*, *Enterobius* and many others). Life cycle and pathogenicity of Cestodes. (The tapeworms, Larval forms of cestodes). Life cycle and pathogenicity of the Trematodes (The Schistosoma, Fasciola, *Paragonimus*, and many others). Methods of demonstration of parasites in blood, faeces, vagina, urine, urethra, pus from lung and liver, skin snips, and many others. Mechanisms of their disease production; Epidemiology and control of parasitic diseases. Arthropods of medical importance particularly members of the class Diptera, the crustaceans, Arachnida, Hexapoda, Myiasis and many others, their biology, life cycles and control. Life history as disease vectors; various diseases of importance transmissible by insects. Biology of mosquito in relation to transmission of malaria, filariasis, viral infections and many others.

MLS 310: Biomedical Engineering

(2 Units C: LH 15; PH 45)

Learning Outcomes

At the end of this course, students should be able to:

1. describe the basic concepts of principles of use and maintenance repair of common apparatus and laboratory equipment; and
2. acquire skill of repair of common apparatus and laboratory equipment.

Course Contents

Workshop practice. Principles of use maintenance and repair of common apparatus and laboratory equipment. Principles of applied and general electronics. Circuit diagrams, Computer programming. Improvisation. Glass blowing and construction of simple laboratory equipment. Design techniques, improvement on existing equipment, review and modifications of laboratory methods.

PHA 301: Basic Pharmacology and Toxicology:

(2 Units: C: 15 LH; 45 PH)

Learning Outcomes

At the end of this course students should be able to;

1. identify the factors that influence the absorption of an orally administered drug;
2. relate the factors that influence the rate of drug elimination;
3. define drug distribution and factors that influence it;
4. describe the major toxicities of the drugs prescribed;
5. explain the role of the Medical Laboratory in the evaluation of exposure to poisons; and
6. define pathologic mechanisms of toxicants.

Course Contents

Scope of Pharmacology. Origin and sources of drugs, routes of administration of drugs, drug receptors and receptor isolation. Pharmacokinetics, absorption of drugs excretion, biotransformation. Structure-activity relationship. Mode of action of drugs. Types of drug action. Drug action in man-compliance, individual variations, presence of other drugs, genetic effects, tolerance and tachyphylaxis, effects of diseases, drug toxicity adverse drug reactions, drug dependence and drug interactions. Antimicrobial Pharmacology chemotherapeutic agents, anti-metabolic base analogues, mitotic inhibitors, antibiotics, enzymes, alkylating agents and hormones. Radiation therapy, immune therapy and cancer therapy, synthesis and physiology of



neurotransmitters Biochemical basis of depression. Marcotics-Mechanism of action. Fluorescent, radio and chromatographic methods in drug studies. Methods of evaluation of toxins mutagens and carcinogens.

400 Level

MLS 401: Laboratory Management and Functions and General Laboratory Practice (2 Units C: LH 15; PH 45)

Learning Outcomes

At the end of this course, students should be able to:

1. discuss the basic concepts of medical laboratory design;
2. discuss planning and organisation;
3. explain accounts and budgeting, ordering, stock – card indexing;
4. describe storage and occupational hazards;
5. explain theory and practice of some common analytical techniques including tissue processing;
6. describe microscopy and other basic Microbiological Equipment use;
7. discuss the principles of Histological Equipment; and
8. discuss the principles and working of haematological and clinical chemistry equipment.

Course Contents

Principles and functions of Management. Personnel Management, Staff/Management relationships, stock control, record keeping. Management and administrative practices. Ecology of administration. Inventory and quality control Accounting and budgeting. Medico-legal aspects of medical laboratory Sciences. Professional ethics. Laboratory planning. Introduction to statistical procedures and biological research estimation, analysis of variance, tests of significance, goodness of fit, correlation and regression. Theory and practice of quality control – setting up quality control, various methods of quality control; factors affecting quality of output. Theory and practice of some common Analytical techniques including tissue processing, Microscopy and other basic Microbiological Equipment use, and principles of Histological Equipment, principles and working of haematological clinical chemistry Equipment; other applied techniques in the Medical Laboratory with emphasis on general Medical Laboratory Instrumentation. Practical Classes based on the above topics. General Review and appraisals of all subjects and practice of medical laboratory sciences to be examined as a common General paper.

MLS 402: Medical Laboratory Haematology I

(2 Units C: LH 15; PH 45)

Learning Outcomes

At the end of this course, students should be able to:

1. acquire knowledge and skill on the laboratory management of different types of anaemia; and
2. acquire knowledge and skill on the laboratory identification of different Leukaemia.



Course Contents

Iron metabolism, folate and B2 metabolism. Nomenclature, classification and investigation of common haemoglobinopathies, haemolytic anaemias, myeloproliferative disorders, lymphoproliferative disorders, haemostasis and disorders of haemostasis; investigation of bleeding disorders. Bone marrow. Practical classes.

MLS 403: Medical Laboratory Histopathology I (2 Units C: LH 15; PH 45)

Learning Outcomes

At the end of this course, students should be able to:

1. discuss basic concepts of the cytology of normal cells;
2. describe the epithelial cells; and
3. discuss atypical and malignant cells.

Course Contents

DNA – demonstration by Feulgen techniques. Silver impregnation methods. Genes and genetic code. Tissue culture techniques; chromosome analysis. Autoradiography – Definition and principle of organisation of a medical museum. Methods of colour maintenance. Fixation and storage of museum specimens. Special museum techniques such as Dawson's Method. Principle of Photography Preparation of stained sections for micro photography. Preparation of specimens for preparation of stained sections for micro photography. Cytological normal cells. Histology of tissues. Atypical and malignant cells. Collection of cytological smears and processing and screening. Principles of general pathology. Systemic pathology. Gastrointestinal tract. Urogenital, cutaneous. Principle of Electron microscopy materials for electron microscopy. Respiratory – Tuberculosis. Nephropathy associated with infestations and infections. Embalming techniques and demonstrations and infections. Practical based on the topics.

MLS 404: Medical Laboratory Microbiology I (2 Units C: LH 15; PH 45)

Learning Outcomes

At the end of this course, students should be able to:

1. describe the basic concepts of epidemiology of communicable diseases;
2. discuss disease spectrum; and
3. explain basic concepts of disease control.

Course Contents

Epidemiology of communicable diseases and disease spectrum and control. Aspects of public Health and Environmental Microbiology. Applied Microbiology; aspects of food and Industrial Microbiology. Diagnostic Microbiology. Vaccine production and immunization. Preservation of cultures and cultural methods. Pathogenic mechanisms of bacteria. Antibiotic assays and monitoring from body fluids and many others, anaerobiosis and methods. Phage typing; Research Methods and other techniques in Microbiology. Use of metabolic pathways in identification of bacteria, fluorescent antibody methods. Quality control and Instrumentation. Practical based on the above topics.



MLS 405: Laboratory Instrumentation & Techniques**(2 Units C: LH 15; PH 45)****Learning Outcomes**

At the end of this course, students should be able to:

1. describe the principles instrumentation;
2. explain care of basic equipment;
3. describe the theory and practice of some common Analytical techniques; and
4. discuss automation used in Medical Laboratory Science.

Course Contents

Instrument aspects of qualitative and quantitative analysis – theory and practise of some common analytical techniques: colourimetry, spectrofluorimetry flame photometry, conductometry, polarography, and many others. Osmometry, Rephelometry, Turbidimetry, pH Measurement by ion specific electrodes – Separation techniques including electrophoresis, - paper, cellulose acetate, Agar gel, starch and polyacrylamide gel, Isoelectric focusing, Isotaphoresis, Chromatography – paper, Thin Layer Chromatography, Gas Liquid Chromatography, Ion exchange, gel filtration, molecular sieves; Dialysis filtration, solvent extraction, Centrifugation – Ultracentrifugation. Immuno-electrophoretic techniques, Radioimmunoassay, Competitive protein binding, Isotope dilution techniques, Enzyme Immuno Assays, Receptor Assays, Automation, Micro and Ultra micro Analysis. Practical based on the above topics. Theory and practice of some common Analytical techniques including tissue processing, Microscopy and other basic Microbiological Equipment, Principles and working of haematological Equipment, other applied techniques in the Medical Laboratory with emphasis on general Medical Laboratory Instrumentation. Practical exercises on the above topics.

MLS 406: Research Methodology**(2 Units C: LH 15; PH 45)****Learning Outcomes**

At the end of this course students should be able to:

1. conduct a research project;
2. discuss the role of research in health and social welfare; and
3. discuss the designing a questionnaire.

Course Contents

Introduction to research methodology. Collection of literature review articles Problem definition. Sampling technique Experimental designs of medical and public health studies. Questionnaire design and collection analysis. Interpretation and utilization of research findings. The role of research in health and social welfare. The need for Institutional and Governmental ethical clearance for some research projects. Research proposals and sourcing of funding for research projects. Art of scholarly publications and Instructional design.



MLS 408: Laboratory Posting II

(2 Units C: LH 15; PH 45)

Learning Outcomes

At the end of this course, students should be able to:

1. discuss the basic tests expected to be carried out;
2. deliver accurate and reliable results of basic laboratory test;
3. recognise and practice as a team in the laboratory with the soul aim of producing cost effective results for the management of patient;
4. recognise and refer complex test to experience scientists; and
5. guide junior students.

Course Contents

Basic medical laboratory tests in Medical Microbiology/Parasitology including Virology, Mycology and Bacteriology, chemical pathology, Haematology and Blood Transfusion science and Histopathology. Such tests include detection of malaria parasites in blood and intestinal parasites in stool. Wet preparation and Gram staining of biological specimens. Preparation of media and inoculation of specimen. Determination of Hb, PCV and processing of blood samples for Haematology and blood Transfusion examinations. Screening of blood donors and Determination of ABO and Rhesus blood groups. Urinalysis, estimation of glucose, urea. Processing of Histopathology specimens including fixation, staining and cutting of tissues.

MLS 410: Clinical Chemistry I

(2 Units C: LH 15; PH 45)

Learning Outcomes

At the end of this course, students should be able to:

1. acquire knowledge and skill required for the laboratory investigation of porphyrinaemia;
2. describe the laboratory investigation of porphyria; and
3. discuss laboratory investigation of porphyrinuria.

Course Contents

Porphyria, causes, symptoms and laboratory investigation of porphyrinaemia, porphyria and Porphyrinuria, Haemoglobin, synthesis, function. Glycosylated haemoglobins. Abnormal haemoglobins and haemoglobinopathies, Liver function Tests.

Mechanism of Enzyme action and kinetics: Clinical Enzymology; Isoenzymes in medicine, Coenzymes and Vitamins. Definition, causes, consequences and investigation of some inborn errors of metabolism; Phenylketonuria, galactosaemia fructose intolerance, Albinism, aminoaciduria, Endocrine glands and functions; the hypothalamus, the pituitary, the parathyroid, adrenal cortex, adrenal medulla, the gonads and reproductive endocrinology. Foeto-placental function. Calcium and bone metabolism. Pancreatic function tests. Basic neurochemistry, CSF – normal composition and changes in disease.

MLS 411: Blood Group Serology

(2 Units C: LH 15; PH 45)

Learning Outcomes

At the end of this course, students should be able to:

1. discuss the components of ABO; and
2. acquire the knowledge of Rhesus blood group systems.

Course Contents



Blood groups – Other blood groups such as MNS, Duff, Kell, Kidd and many others. Grouping techniques and antibody screening, clinical significance, secretor status, antenatal Serology – screening and Titration. Compatibility procedures – different methods, advantages and disadvantages, Blood Transfusion reactions – causes and types; Investigation, Risks attendant in blood transfusion – Diseases, Anaphylactic, haemolytic and allergic reactions. Screening of Donor blood for disease agents such as HbAgs, HIV, VDRL. Practical/tutorials. Compatibility procedures – advantages and disadvantages. Practical based on the above topics.

MLS 412: Professional Ethics in Medical Laboratory Science (2 Units C: LH 15; PH 45)

Learning Outcomes

At the end of this course students should be able to:

1. discuss ethics in the practice of Medical Laboratory Science;
2. emphasise the significance of ethics of practice and confidentiality of results;
3. discuss the Ethical issues involved in private practice; and
4. describe the relationship between the Medical Laboratory Scientist and other members of the Health team.

Course Contents

Introduction to the Science and profession of Medical Laboratory Science. The different arms of medical Laboratory Sciences. Hall marks characterizing the lives of all professions; licensing to practice, Group culture patterns. Justice, rights and responsibilities as a professional.

The concept of duty, professional standards and Laboratory management. Authority and discipline. The use of reason. Personal relationships – inter and intra professional, Act of good faith. Place of religion in the hospital. Value judgment, exercise of professional judgment, skill and care charge and wellbeing of patients. Patients - professional relationship – confidentiality, communication skills; trust; seeking to safeguard patients, particularly in respect to health and safety and information. Research training, professional development, knowledge and skill, quality control in the field of medical laboratory sciences and practice: Reputation. Fulfilment of professional role with integrity, refraining from its misuse to the detriment of patients, employers and colleagues. Medico-legal aspects.

500 Level

MLS 502: Laboratory Posting III

(2 Units C: LH 15; PH 45)

Learning Outcomes

At the end of this course, students should be able to:

1. show or demonstrate competency in independent running of a medical laboratory as a full fledged professional;
2. display right administrative acumen in the running of a medical laboratory facility; and
3. impart the right knowledge and professional know how to upcoming students and scientists.



Course Contents

Conduct of complex and intellectually tasking medical laboratory tests independently in the specific area of specialisation. Organisation and leadership in the administration of the laboratory. Coordination with other professionals that utilise laboratory services. Innovative technologies like molecular biology techniques e.g PCR, antigen/antibody serological assays among others.

MLS 503: Practical Exercises II

(2 Units C: PH 45)

Each student carries out practical based on the area of major specialty.

Clinical Chemistry

Determination of blood glucose, glucose tolerance test. Determination of calcium and phosphate, uric acid, cholesterol, creatinine clearance, electrolytes and urea, total protein albumin and globulin. Plasma protein electrophoresis. Determination of plasma enzymes: - aspartate transaminase, alanine transaminase, acid and alkaline phosphatase. Demonstration. Blood gases and pH by Astrup Technique. Paper and thin layer chromatography, Immuno-electrophoresis and agar gel immuno-diffusion techniques.

Demonstration: Radioimmunoassay of hormones in blood. Estimation of 17-oxo and Oxogenic steroids in urine. Estimation of urinary buffers. Calculation from first principle. Absorption and calibration curves. Colour Equivalence of artificial standards. Fractional test meal. Calculi analysis.

Haematology and Blood Group Serology

Investigations in paternity dispute. Investigation of haemorrhagic and preparation of cryoprecipitate, haemolytic disease of the new born (HDN), haemoglobinopathies, auto-immune haemolytic anaemia, enzymopathies. Preparation of anti-sera, bovine albumin, anti-human globulin. Gamma globulin neutralization test. Forensic application of Blood Group Serology. Differential leucocytes count. Cytochemical procedures. Advanced techniques such as Demonstration of Iron, Foetal Haemoglobin, Ham's Test and many others.

Histopathology

Special staining methods – PAS, Manson trichrome, Iron Impregnation Methods. Cytological staining methods and collection of cytological samples. Chromosome analysis. Autoradiography. Museum techniques. Cyto-screening and slide reporting. Cutting sections using the microtomes. Tissue (cell) culturing, Fungi, amyloid, enzyme and other specialized demonstration methods.

Medical Microbiology and Parasitology

Examination, culture and identification of bacteria in CSF pleural, ascitic fluid. Blood culture, High vaginal swab, wound swabs, ear, eye, nasal and other swabs. Stool bacteriology. Sputum bacteriology, Urine bacteriology. Systemic fungal culture and identification. Semen analysis. Special serological tests. ASO Widal, VDRL, rheumatoid factor, Complement fixation, neutralization, haemagglutination tests for identification of viruses. General identification of micro-organisms by animal inoculation. Biochemical tests for the identification of *Vibrio cholera*, *Shigella*, *Candida*, *Neisseria*.



MLS 504: Research Project

(6 Units C: PH 270)

Learning Outcomes

At the end of the course, students should be able to:

1. explain laboratory procedures including safety precautions;
2. carry out independent researches that will lead to tangible outcomes; and
3. present outcome of their researches in seminars and conferences.

Course Contents

Independent research findings into selected areas/topics of interest to the supervising academic staff. Students will be required to carry out literature survey on the topics, perform experiments and produce reports (preferably at the end of second semester). Students will be subjected to both seminar and oral examination on the projects undertaken.

MLS 505: Seminar

(2 Units C: LH 30)

Learning Outcomes

At the end of this course, students should be able to:

1. identify a topic of current interest in any branch of medical laboratory science;
2. search for the appropriate literature in the chosen topic; and
3. prepare and disseminate the knowledge using the appropriate format within a time frame.

Course Contents

A seminar on current concepts or advances on a specific topic in medical Laboratory Science. The aim is to develop in the student the ability to search for past and current literature on any given topic.

MLS 508: Clinical Chemistry II

(2 Units C: LH 15; PH 45)

Learning Outcomes

At the end of this course, students should be able to:

1. describe basic concepts of general principles of enzymes kinetics;
2. discuss analytical techniques employed in qualitative and quantitative determination of enzymes; and
3. describe basic concepts of activation.

Course Contents

Analytical Techniques. Birth of a new method, devising new techniques, biological trials and tests for acceptability. Solid/dry phase chemistry, dipstick technology, thin film technology. Immobilised enzymes. Analytical techniques employed in qualitative and quantitative determination of (a) Enzymes: phosphatases, transaminases, dehydrogenases, Kinases (b) Hormones: catecholamines and metabolites peptide and steroid hormones (c) Proteins: total proteins albumin and globulin, specific proteins (d) Lipids: cholesterol, triglycerides, glycerol, fatty acids and lipoproteins. (e) Trace elements – Fe, Cu Zn, Mg, Selenium (f) non-protein nitrogen – Urea, creatinine, creatine, uric acid, amino acids and ammonia Urinalysis; determination of urine specific gravity, osmolarity; qualitative tests for protein, glucose. and reducing substances, Ketone bodies, bilirubin urobilinogen and blood. Haemoglobin and haemoglobin derivatives in urine. Spectroscopy of haemoglobin and its derivatives in blood and urine.



MLS 510: Medical Laboratory Haematology II**(2 Units C: LH 15; PH 45)****Learning Outcomes**

At the end of this course, students should be able to:

1. conduct advanced haematological procedures;
2. discuss the disorders of Iron metabolism; and
3. describe the different automation in Haematology.

Course Contents

Anaemias, Disorders of Iron metabolism, vitamin B12 and Folate deficiencies, Haemochromatosis and related storage disorders; Radioisotopes in Haematology; Automation in Haematology, Haemoglobinopathies. Cytochemical procedures, Lymphocyte Transformation Tests. Myelomatosis and order paraproteinemia. Test. Advanced Techniques.

MLS 512: Medical Laboratory Histopathology II**(2 Units C : LH 15; PH 45)****Learning Outcomes**

At the end of this course, students should be able to:

1. describe the basic concepts of the methodology of Histochemistry; and
2. describe basic concepts of the tissue culture technique.

Course Contents

Theory and Methodology of Histochemistry – Chromaffin tissues, Schmolz, Diazo and Perls and other histochemical techniques. Enzyme histochemistry: Acid and alkaline phosphatase, Oxidative enzymes. Genetic diseases. Karyotype abnormalities. Chromosome techniques. Tissue culture technique. Chromosome staining techniques Slide reporting.

MLS 514: Medical Laboratory Microbiology II**(2 Units C: LH 15; PH 45)****Learning Outcomes**

At the end of this course, students should be able to:

1. discuss basic concepts of methods for the diagnosis of fungal infections; and
2. discuss basic concepts of methods for the diagnosis of viral infections.

Course Contents

General characteristics of fungus diseases, types of mycoses and properties; opportunistic fungi Diagnosis and chemotherapy. Systemic mycoses (cryptococcosis, blastomycosis, histoplasmosis, coccidioidomycosis). Opportunistic mycoses (candidiasis, phycomycetes, aspergilloses and many others). subcutaneous mycoses. (such as maduro mycoses, sporotrichoses, chromoblastomycosis, and many others. Cutaneous mycoses – dermatophytosis. Superficial mycoses and many others. General properties, pathogenesis, diagnosis, epidemiology and control and recognition of fungi. Derma tropic and viscerotropic viruses. Smallpox, cowpox and vaccination; measles, rubella, chickenpox and shingles, Herpes viruses. Yellow fever; Lassa fever, Hep A and B, Influenza, Arbor viruses. The neurotropic viruses (rabies, poliomyelitis, encephalitis, lymphocytic choriomeningitis virus, mumps viral transformation and types of tumours and viruses. Oncogene theory and many others. Viral gastroenteritis; Miscellaneous viruses.



Minimum Academic Standards

Equipment

Essential Equipment in various Disciplines

Haematology/Blood Transfusion Science

| | | |
|------------------------------------|---|-------------------|
| Autoanalyzers | - | 2 |
| Microscopes | - | 1 per 2 students |
| Waterbath | - | 1 per 10 students |
| Haematocrit centrifuge | - | 1 per 4 students |
| Electrophoresis tank and powerpack | - | 1 per 4 students |
| Colorimeters | - | 1 per 4 students |
| Bench centrifuges | - | 1 per 10 students |
| Weighing Balance | - | 1 per 10 students |
| Neubauer counting chamber | - | 1 per 4 students |
| pH meter | - | 1 per 10 students |
| Cold centrifuge | - | 1 |
| Coagulometer | - | 2 |
| Platelet Aggregometer | - | 1 |
| Medical Microbiology/Parasitology | | |
| Binocular microscopes | - | 1 per 2 students |
| Fluorescent microscope | - | 1 per 10 students |
| Magnifying lens | - | 1 per student |
| Centrifuges | - | 1 per 10 students |
| Incubators | - | 1 per 10 |
| Anaerobic culture jars | - | 1 per 10 |
| Membrane/sietz filters | - | 1 per 5 |
| Metler balance | - | 4 |
| Autoclaves | - | 2 |
| Deioniser | - | 2 |
| Water baths | - | 3 |
| Hot air ovens | - | 3 |
| Bunsen burners | - | 1 per 4 |
| Freezers | - | 1 per 20 |
| Electron microscopes | - | 2 |
| Ultra-centrifuge | - | 1 |

Chemical Pathology/Immunology

| | | |
|--------------------|---|---|
| Electronic balance | - | 2 |
|--------------------|---|---|



| | | |
|-------------------------------------|---|-----------------|
| Spectrophotometer | - | 1per 20students |
| pH Meters | - | 1per 20students |
| Atomic absorption spectrophotometer | - | 2 |
| Auto analyzers | - | 2 |
| Colorimeters | - | 6 |
| Flame Photometer | - | 2 |
| Water distiller | - | 2 |
| Gas, Liquid, TLC chromatographs | - | 2 |
| Vacuum pumps | - | 2 |
| Rotary evaporator | - | 2 |
| Centrifuge | - | 2 |

Histopathology/Cytology

| | | |
|------------------------------------|---|----------------|
| Microtome | - | 2Rotary/sledge |
| Microtome knives | - | 3 |
| Light microscopes | - | 1per 2students |
| Dissecting microscopes | - | 3 |
| Slides of sections/slide projector | - | 1 |
| Cryostat with microtome | - | 1 |
| Tissue processing machine | - | 2 |
| Multihead Teaching Microscope | - | 1 |

Staffing

Academic Staff – The academic staff should have Ph.D. degrees in relevant disciplines of Medical Laboratory Science. The existing guideline that states that 70% and above of the academic staff should possess Ph.D shall apply.
One academic staff per 15 students (1:15) should be equitably distributed in the disciplines.

Staff Mix by Rank:

The staff mix by rank of Professors, Senior Lecturers and Lecturer 1 and below of 20:35:45 shall apply.

Non-Academic Staff (Senior Technical Staff)

This is comprised of qualified and registered Medical Laboratory Scientists and should be at least 25% of the strength of the Academic Staff in the department.

Library



Each Unit of Medical Laboratory Science should have a well-stocked library with upto date journals and books relevant to Medical Laboratory Science.
There should be computer based information service and e-Library facilities.
Establishment of an audiovisual Laboratory/Learning Resources with Phantoms, CD Roms, and many others.

Classroom, Laboratories and Offices Space

Classroom

The standard requirement of 0.65m² per full-time student should be maintained. Thus the minimum total space requirement for a faculty or department shall be the product of its total full time equivalent student enrolment (FTE) and the minimum space requirement per full-time equivalent i.e. (FTE) 0.65m².

Office

In this respect, each academic staff should have an office space of at least 25 square metres taking into cognisance the status/cadre of the staff

In addition, there should be for the Faculty, a Dean's office and for each Department a Head of Department's office with attached offices for their supporting staff as specified below in m²:

| | | |
|----------------------------------|---|-------|
| Professor's office | - | 18.50 |
| Head of Department's office | - | 18.50 |
| Tutorial teaching staff's office | - | 13.50 |
| Other teaching staff space | - | 7.00 |
| Technical staff space | - | 7.00 |
| Secretarial space | - | 7.00 |
| Staff research laboratory | - | 16.50 |
| Seminar Space/per student | - | 1.85 |
| Laboratory space (per student) | - | 7.50 |



B. N.Sc. Nursing Science

Overview

The Bachelor of Nursing Science (BNSc.) degree programme is a generic nursing programme designed to provide sound educational and nursing knowledge essential to the preparation of nurses who will function independently and as members of the interdisciplinary health team. The health trends globally have shown disease patterns characterised by emerging and re-emerging diseases with high impact in Africa and Nigeria. There is therefore the need for a curriculum that will provide enhanced competencies, enabling nurses to provide comprehensive care and manage various disease conditions in health facilities and community settings while ensuring safety for clients and self as well as engage in referrals to appropriate services at higher levels accordingly. The Bachelor of Nursing Science (B.N.Sc.) programme runs for five years for those admitted through the Unified Tertiary Matriculation Examination (UTME) and four years for those coming through Direct Entry (DE). Students enrolled for the programme cover compulsory courses from the Life Sciences and Social Sciences and broad areas in Nursing focusing on four major clinical practice areas of community-public health, medical-surgical, maternal-child health and midwifery and mental health nursing. They are expected to also undergo clinical postings/placements in various health care facilities and community centres for requisite exposure and experiences

Philosophy

The Philosophy of the Nursing degree programme is hinged on the belief that human beings are bio-psycho-social beings whose needs are the focus of all nursing activities directed at achieving high level wellness.

Nursing utilises a blend of its own science with knowledge from the life sciences, social sciences, science of human behaviour and other applied sciences in understanding the changes in the client systems. It utilises the scientific method of inquiry and engages in evidence based practice in providing health care while providing nursing intervention to individuals, families, groups and communities at the primary, secondary and tertiary levels of care.

Objectives

The Bachelor of Nursing Science Degree Programme is specifically designed to:

1. prepare graduate nurses who can think and communicate thoughts effectively discriminate among values, and utilise evidence to inform actions in healthcare;
2. produce polyvalent nurses capable of delivering care in a variety of settings therapeutically;
3. assisting individuals, families and communities with diverse back grounds and health problems to;
4. attain optimal health and performing nursing skills at proficient levels that assured safety of the clients;
5. produce graduates who can relate their roles in health care service delivery to the broader social system and who will be engaged in life-long and self-directed learning;
6. prepare graduates who will communicate effectively with clients, members of the health care team and other stakeholders, using current technologies in education and delivery of health care services prepare graduates who can initiate innovative changes in nursing education, practice and administration through research; and



7. prepare graduates who can initiate innovative changes in nursing education, (clinical) practice and administration through research.

Unique Features of the Programme

Students who are admitted through UTME are expected to sit for the professional nursing certificate exams at 400 levels and sit for the post basic midwifery or any other post basic professional exams together with those who are admitted through DE at 500 level. Other specific features include:

1. preparing individuals for continuous professional development and lifelong learning;
2. equipping them with management skills;
3. professional, personal and quality development opportunities; and
4. life skills that facilitate adaptation to work and living.

Employability Skills

Graduates of the BNSc. programme can focus on practice in any clinical area of practice of Nursing such as medical surgical, maternal, child health and midwifery, community/public health, mental health nursing and the choices help in shaping their careers. The graduates of the programme can also choose if they wish to work in the clinical practice, academics, in schools or with development or donor agencies in the private or public sector.

Specific skills that enhance employability include but are not limited to:

1. communication skills;
2. relationship and Inter-professional skills;
3. professional practice in accordance with relevant legislation and regulation;
4. skills for provision of comprehensive, safe, evidence-based care consistent with professional and organisational standards;
5. leadership and management skills;
6. research skills to facilitate development of nursing and quality improvement and quality assurance procedures; and
7. creative thinking and problem solving skills.

21st Century Skills

Graduates of BNSc programme are trained in diverse areas of nursing science and possess 21st century digital innovations in health care and education in nursing informatics and nursing entrepreneurship. Emphases are on:

1. partnership and collaboration;
2. effective communication;
3. ethical decision making;
4. creativity;
5. advocacy;
6. digital literacy
7. multi-disciplinary collaborations;
8. leadership skills and team work; and
9. critical thinking and problem solving skills.



Admission and Graduation Requirements

Five-Year Degree Programme:

In addition to appropriate Unified Tertiary Matriculation Examination scores, candidate must obtain five Senior Secondary Certificate (SSC) (or its equivalent) credit passes including Mathematics, Physics, Chemistry, Biology and English Language at not more than two sittings.

Direct Entry (Four-Year Degree Programme):

Candidates possessing Registered Nurse Certificate (RN)/Registered Midwife Certificate (RM) and the required five subjects at SSC with two Advance Level subjects may be admitted by Direct Entry.

The pass mark for core courses is 50%. The degree is a unclassified degree.

Duration of Programme

The duration of the B.N.Sc. Degree Course is five years (10 consecutive semester) for Joint Matriculation Examination (UTME) Entry candidates and four years (eight consecutive semester) for Direct Entry Candidates. As a professional degree, the B.N.Sc shall not be classified. However, it shall be awarded as follows:

| | |
|-------------|------|
| 2.40 – 5.00 | Pass |
|-------------|------|

Global Course Structure

The programme builds solid foundation in the basic and social sciences from the 100 level with other students. These are followed by courses in the life and basic medical sciences from the second year. The nursing courses are introduced from the second year and continue systematically with the core nursing courses in four majors areas of clinical practice. Professional courses are accompanied by laboratory and clinical skills acquisition in clinical practice to enable learners acquire some levels of competence. Many of the professional courses have clinical skills acquisition components that require direct contact with patients and their families either in the home, community, hospitals or other approved practice settings.

Preamble

Courses shall be provided leading to the degree of Bachelor of Nursing Sciences.

Course Structure Guide

One (1) Lecture Hour (LH) X 15 Weeks = One (1) Unit

Three (3) Laboratory Practical Hour (PH) X 15 Weeks = One (1) Unit

Forty-Five (45) Clinical Practicum Hours = One (1) Unit

***** Students who do not possess the Basic Registered Nurse (RN) certificate are expected to sit for the professional examination at the beginning of 400 levels whereas other professional examinations are taken in 500 levels.**



100 Level

| Course Code | Course Title | Unit(s) | Status | LH | PH |
|--------------------|-----------------------------------|----------------|---------------|-----------|-----------|
| GST 111 | Communication in English I | 2 | C | 15 | 45 |
| GST 112 | Nigerian Peoples and Culture | 2 | C | 30 | - |
| BIO 101 | General Biology I | 2 | C | 30 | - |
| BIO 102 | General Biology II | 2 | C | 30 | - |
| BIO 107 | General Biology Practical I | 1 | C | - | 45 |
| BIO 108 | General Biology Practical II | 1 | C | - | 45 |
| CHM 101 | General Chemistry I | 2 | C | 30 | - |
| CHM 102 | General Chemistry II | 2 | C | 30 | - |
| CHM 107 | General Chemistry Practical I | 1 | C | - | 45 |
| CHM 108 | General Chemistry Practical II | 1 | C | - | 45 |
| MTH 101 | Elementary Mathematics | 2 | C | 30 | - |
| COS 101 | Introduction to Computing Science | 3 | C | 30 | 45 |
| PHY 101 | General Physics I | 2 | C | 30 | - |
| PHY 102 | General Physics II | 2 | C | 30 | - |
| PHY 107 | General Physics Practical I | 1 | C | - | 45 |
| PHY 108 | General Physics Practical II | 1 | C | - | 45 |
| | Total | 27 | | | |

200 Level

| Course Code | Course Title | Unit(s) | Status | LH | PH |
|--------------------|---|----------------|---------------|-----------|-----------|
| GST 212 | Philosophy, Logic and Human | 2 | C | 30 | - |
| ENT 211 | Entrepreneurship and Innovation | 2 | C | 30 | - |
| ANA 203 | General and Systemic embryology | 2 | C | 30 | - |
| ANA 201 | Anatomy of upper and Lower Limb | 3 | C | 30 | 45 |
| PIO 201 | Introductory Physiology and Blood | 2 | C | 30 | - |
| BCH 201 | Biochemistry – General and Medical I | 2 | C | 30 | - |
| NSC 201 | Foundation of Professional Nursing | 2 | C | 15 | 45 |
| NSC 203 | Developmental | 1 | C | 15 | - |
| PIO 212 | Renal and Body Fluids Physiology | 2 | C | 30 | - |
| ANA 204 | Anatomy of Thorax, Abdomen, Pelvis and Perinium | 3 | C | 30 | 45 |
| BCH 206 | Biochemistry – General and Medical | 2 | C | 30 | - |
| BCH 203 | General Biochemistry Practical | 1 | C | - | 45 |
| NSC 202 | Foundation of Nursing II | 2 | C | 15 | 45 |
| NSC 206 | General and Cellular Pathology | 2 | C | 30 | - |
| | Total | 28 | | | |



300 Level

| Course Code | Course Title | Unit(s) | Status | LH | PH |
|-------------|---|-----------|--------|----|------|
| GST 312 | Peace and Conflict Resolution | 2 | C | 30 | - |
| GST 312 | Venture Creation | 2 | C | 15 | 45 |
| PHA 301 | Pharmacodynamics and Chemotherapy I | 2 | C | 30 | - |
| NSC 301 | Epidemiology | 1 | C | 15 | - |
| NSC 303 | Community/Public Health Nursing I | 2 | C | 30 | - |
| NSC 307 | Human Nutrition | 2 | C | 30 | |
| NSC 309 | Nursing Ethics and Jurisprudence | 2 | C | 30 | - |
| NSC 313 | Medical -Surgical Nursing I | 2 | C | 30 | - |
| NSC 302 | Community/Public Health Nursing II | 2 | C | 15 | 45 |
| NSC 306 | Medical -Surgical Nursing II | 2 | C | 15 | 45 |
| NSC 308 | Medical Surgical Nursing III | 2 | C | 30 | - |
| NSC 312 | Medical Surgical Nursing Practicum II (SIWES) | 2 | C | - | 90** |
| NSC 314 | Mental Health Nursing I | 2 | C | 15 | 45 |
| PHA 302 | Pharmacodynamics and Chemotherapy II | 2 | C | 15 | 45 |
| | Total | 27 | | | |

**** Clinical Practicum****400 Level**

| Course Code | Course Title | Unit(s) | Status | LH | PH |
|-------------|---|-----------|--------|----|-------|
| NSC 401 | Medical-Surgical Nursing Practicum III | 3 | C | - | 135** |
| NSC 403 | Maternal and Child Health 1 | 2 | C | 30 | - |
| NSC 405 | Mental Health Nursing II | 2 | C | 15 | 45 |
| NSC 411 | Biostatistics | 1 | C | 15 | - |
| NSC 407 | Research Methodology | 2 | C | 30 | - |
| NSC 409 | Management of Nursing Services | 2 | C | 30 | |
| NSC 402 | Maternal and Child Health Nursing | 2 | C | 15 | 45 |
| NSC 404 | Maternal and Child Health Nursing Practicum I | 2 | C | - | 90** |
| NSC 406 | Curriculum Development and Teaching Methodology | 2 | C | 30 | - |
| NSC 410 | Community/Public Health Nursing III | 2 | C | 30 | - |
| | Total | 20 | | | |

**** Clinical Practicum/Field Work/Practicum for Data Collection****500 Level**

| Course Code | Course Title | Unit(s) | Status | LH | PH |
|-------------|--|-----------|--------|----|------|
| NSC 501 | Community/Public Health Nursing II Practicum | 2 | C | - | 90* |
| NSC 503 | Maternal and Child Health Practicum II | 2 | C | | 90* |
| NSC 505 | Maternal and Child health Nursing III | 2 | C | 15 | 45 |
| NSC 509 | Health and Nursing Informatics | 2 | C | 30 | |
| NSC 511 | Nursing Seminars | 2 | C | 30 | |
| NSC 513 | Health Economics | 2 | C | 30 | - |
| NSC 502 | Maternal and Child Health Nursing Practicum IV | 3 | C | 15 | 90** |
| NSC 504 | Community/Public Health Nursing IV | 2 | C | 30 | |
| NSC 506 | Community/Public Health Nursing Practicum III | 2 | C | | 90** |
| NSC 508 | Entrepreneurship in Nursing | 2 | C | 30 | - |
| NSC 510 | Research Project | 4 | C | | 180* |
| | Total | 25 | | | |

**** Clinical Practicum**

Nursing Practice Specialties

| First Semester | Second Semester |
|--------------------------------------|--------------------------------|
| Neonatal Nursing | Paediatric Nursing |
| Orthopaedic Nursing | Occupational Health Nursing |
| Perioperative Nursing | School Nursing |
| Nephrology Nursing | Gerontology Nursing |
| Cultural/Transcultural Nursing | Ophthalmic Nursing |
| Dental Nursing | Cardio-thoracic Nursing |
| Disability and Special Needs Nursing | Emergency and Disaster Nursing |

Course Contents and Learning Outcomes

100 Level

GST 111: Communication in English

(2 Units C: LH 15; PH 45)

Learning Outcomes

At the end of the course, the student should be able to:

1. identify possible sound patterns in English Language;
2. list notable Language skills;
3. classify word formation processes;
4. construct simple and fairly complex sentences in English;
5. apply logical and critical reasoning skills for meaningful presentations;
6. demonstrate an appreciable level of the art of public speaking and listening; and



7. write simple and technical reports.

Course Contents

Sound patterns in English Language (vowels and consonants, phonetics and phonology). English word classes (lexical and grammatical words, definitions, forms, functions, usages, collocations). Sentence in English (types: structural and functional, simple and complex). Grammar and usage (tense, mood, modality and concord, aspects of language use in everyday life). Logical and critical thinking and reasoning methods (logic and syllogism, inductive and deductive argument and reasoning methods, analogy, generalisation and explanations). Ethical considerations, copyright rules and infringements. Writing activities: (pre-writing, writing, post writing, editing and proofreading; brainstorming, outlining, paragraphing, types of writing, summary, essays, letter, curriculum vitae, report writing, note making and many others. Mechanics of writing). Comprehension strategies: (reading and types of reading, comprehension skills, 3rsq). Information and communication technology in modern language learning. Language skills for effective communication. Major word formation processes. Writing and reading comprehension strategies. Logical and critical reasoning for meaningful presentations. Art of public speaking and listening.

GST 112: Nigerian People and Culture

(2 Units C: LH 30)

Learning Outcomes

At the end of the course, the student should be able to:

1. analyse the historical foundation of the Nigerian culture and arts in pre-colonial times;
2. list and identify the major linguistic groups in Nigeria;
3. explain the gradual evolution of Nigeria as a political unit;
4. analyse the concepts of Trade, Economic and Self-reliance status of the Nigerian peoples towards national development;
5. enumerate the challenges of the Nigerian State towards Nation building;
6. analyse the role of the Judiciary in upholding people's fundamental rights;
7. identify acceptable norms and values of the major ethnic groups in Nigeria, and
8. list and suggest possible solutions to identifiable Nigerian environmental, moral and value problems.

Course Contents

Nigerian history, culture and art up to 1800 (Yoruba, Hausa and Igbo peoples and culture; peoples and culture of the ethnic minority groups). Nigeria under colonial rule (advent of colonial rule in Nigeria. Colonial administration of Nigeria). Evolution of Nigeria as a political unit (amalgamation of Nigeria in 1914; formation of political parties in Nigeria; Nationalist movement and struggle for independence). Nigeria and challenges of nation building (military intervention in Nigerian politics; Nigerian Civil War). Concept of trade and economics of self-reliance (indigenous trade and market system; indigenous apprenticeship system among Nigerian people; trade, skill acquisition and self-reliance). Social justices and national development (law definition and classification. Judiciary and fundamental rights. Individual, norms and values (basic Nigeria norms and values, patterns of citizenship acquisition; citizenship and civic responsibilities; indigenous languages, usage and development; negative attitudes and conducts. Cultism, kidnapping and other related social vices). Re-orientation, moral and national values (The 3R's – Reconstruction, Rehabilitation and Re-orientation). Re-orientation Strategies. Operation Feed the Nation (OFN). Green Revolution. Austerity Measures. War Against Indiscipline (WAI). War Against Indiscipline and Corruption



(WAIC). Mass Mobilisation for Self-Reliance. Social Justice and Economic Recovery (MAMSER). National Orientation Agency (NOA). Current socio-political and cultural developments in Nigeria.

BIO 101: General Biology I

(2 Units C: LH 30)

Learning Outcomes

At the end of lectures, students should be able to:

1. explain cell's structure and organisations;
2. summarise functions of cellular organelle;
3. characterise living organisms and state their general reproduction;
4. describe the interrelationship that exists between organisms;
5. discuss the concept of heredity and evolution; and
6. enumerate habitat types and their characteristics.

Course Contents

Cell structure and organisation. functions of cellular organelles. characteristics and classification of living things. chromosomes, genes their relationships and importance. General reproduction. Interrelationships of organisms (competitions, parasitism, predation, symbiosis, commensalisms, mutualism, saprophytism). Heredity and evolution (introduction to Darwinism and Lamarckism, Mendelian laws, explanation of key genetic terms). Elements of ecology and types of habitat.

BIO 102: General Biology II

(2 Units C: LH 30)

Learning Outcomes

At the end of the lectures, students should be able to:

1. List the characteristics, methods of identification and classification of Viruses, bacteria and fungi;
2. state the unique characteristics of plant and animal kingdoms;
3. describe ecological adaptations in the plant and animal kingdoms;
4. explain nutrition, respiration, excretion and reproduction in plants and animals; and
5. describe growth and development in plants and animals.

Course Contents

Basic characteristics, identification and classification of viruses, bacteria and fungi. A generalised survey of the plant and animal kingdoms based mainly on the study of similarities and differences in the external features. Ecological adaptations. Briefs on physiology to include nutrition, respiration, circulatory systems, excretion, reproduction, growth and development.



BIO 107: General Biology Practical I**(1 Unit C: PH 45)****Learning Outcomes**

At the end of the course, students should be able to:

1. outline common laboratory hazards;
2. provide precautions on laboratory hazards;
3. state the functions of the different parts of microscope;
4. use the microscope and describe its maintenance;
5. draw biological diagrams and illustrations; and
6. apply scaling and proportion to biological diagrams.

Course Contents

Common laboratory hazards: prevention and first aid. Measurements in biology. Uses and care of microscope. Compound and dissecting microscope. Biological drawings and illustration, scaling, accuracy and proportion; use of common laboratory apparatus and laboratory experiments designed to illustrate the topics covered in BIO 101.

BIO 108: General Biology Practical II**(1 Unit C: PH 45)****Learning Outcomes**

At the end of the course, students should be able to:

1. describe the anatomy of flowering plants;
2. differentiate types of fruit and seeds;
3. state ways of handling and caring for biological wares;
4. describe the basic histology of animal tissues; and
5. identify various groups in the animal kingdom.

Course Contents

Anatomy of flowering plants, primary vegetative body: stem, leaf and root to show the mature tissues namely parenchyma, collenchyma, sclerenchyma, xylem and phloem. Types of fruits and seeds. Care and use of dissecting kits and other biological wares. Dissection and general histology of animal tissues based on vertebrate forms. Morphology and functions of epithelial, muscular, nervous and connective tissues. Examination of various groups of lower invertebrates under microscopes, identification of various groups of organisms in Animal Kingdom. And any experiment designed to emphasise the practical aspects of topics in BIO 102.

CHM 101: General Chemistry I**(2 Units C: LH 30)****Learning Outcomes**

At the end of this course, the students should be able to:

1. define atom, molecules and chemical reactions;
2. discuss the Modern electronic theory of atoms;
3. write electronic configurations of elements on the periodic table;
4. rationalise the trends of atomic radii, ionization energies, electronegativity of the elements based on their position in the periodic table;
5. identify and balance oxidation – reduction equation and solve redox titration problems.
6. draw shapes of simple molecules and hybridized orbitals;



7. identify the characteristics of acids, bases and salts, and solve problems based on their quantitative relationship;
8. apply the principles of equilibrium to aqueous systems using Le Chatelier's principle to predict the effect of concentration, pressure and temperature changes on equilibrium mixtures;
9. analyse and perform calculations with the thermodynamic functions, enthalpy, entropy and free energy; and
10. determine rates of reactions and its dependence on concentration, time and temperature.

Course Contents

Atoms, molecules and chemical reactions. Modern electronic theory of atoms. Electronic configuration, periodicity and building up of the periodic table. Hybridization and shapes of simple molecules. Valence Forces. Structure of solids. Chemical equations and stoichiometry. Chemical bonding and intermolecular forces. Kinetic theory of matter. Elementary thermochemistry. Rates of reaction. Equilibrium and thermodynamics. Acids, bases and salts. Properties of gases. Redox reactions and introduction to electrochemistry. Radioactivity.

CHM 102: General Chemistry II

(2 Units C: LH 30)

Learning Outcomes

At the end of this course, the students should be able to:

1. state the importance and development of organic chemistry;
2. define fullerenes and its applications;
3. discuss electronic theory;
4. determine the qualitative and quantitative of structures in organic chemistry;
5. describe rules guiding nomenclature and functional group classes of organic chemistry;
6. determine rate of reaction to predict mechanisms of reactions;
7. identify classes of organic functional group with brief description of their chemistry;
8. discuss comparative chemistry of group 1A, IIA and IVA elements; and
9. describe basic properties of Transition metals.

Course Contents

Historical survey of the development and importance of Organic Chemistry. Fullerenes as fourth allotrope of carbon, uses as nanotubules, nanostructures, nanochemistry. Electronic theory in organic chemistry. Isolation and purification of organic compounds. Determination of structures of organic compounds including qualitative and quantitative analysis in organic chemistry. Nomenclature and functional group classes of organic compounds. Introductory reaction mechanism and kinetics. Stereochemistry. The chemistry of alkanes, alkenes, alkynes, alcohols, ethers, amines, alkyl halides, nitriles, aldehydes, ketones, carboxylic acids and derivatives. The Chemistry of selected metals and non-metals. Comparative chemistry of group IA, IIA and IVA elements. Introduction to transition metal chemistry.

CHM 107: General Chemistry Practical I

(1 Unit C: PH 45)

Learning Outcomes

At the end of the course the students should be able to:

1. state the general laboratory rules and safety procedures;
2. collect scientific data and correctly carrying out Chemical experiments;
3. identify the basic glassware and equipment in the laboratory;



4. state the differences between primary and secondary standards;
5. perform redox titration;
6. recording observations and measurements in the laboratory notebooks; and
7. analyse the data to arrive at scientific conclusions.

Course Contents

Laboratory experiments designed to reflect topics presented in courses CHM 101 and CHM 102. These include acid-base titrations, qualitative analysis, redox reactions, gravimetric analysis, data analysis and presentation.

CHM 108: General Chemistry Practical II

(1 Unit C: PH 45)

Learning Outcomes

At the end of this course, the students should be able to:

1. identify the general laboratory rules and safety procedures;
2. collect scientific data and correctly carrying out Chemical experiments;
3. identify the basic glassware and equipment in the laboratory;
4. identify and carry out preliminary tests which includes ignition, boiling point, melting point, test on known and unknown organic compounds;
5. perform solubility tests on known and unknown organic compounds;
6. conduct elemental tests on known and unknown compounds; and
7. conduct functional group/confirmatory test on known and unknown compounds which could be acidic / basic / neutral organic compounds.

Course Contents

Continuation of CHM 107. Additional laboratory experiments to include functional group analysis, quantitative analysis using volumetric methods.

MTH 101: Elementary Mathematics I (Algebra and Trigonometry) (2 Units C: LH 30)

Learning Outcomes

At the end of this course students should be able to:

1. explain basic definition of Set, Subset, Union, Intersection, Complements and use of Venn diagrams;
2. solve quadratic equations;
3. Solve trigonometric functions;
4. identify various types of numbers; and
5. solve some problems using Binomial theorem.

Course Contents

Elementary set theory, subsets, union, intersection, complements, venn diagrams. Real numbers, integers, rational and irrational numbers. Mathematical induction, real sequences and series. Theory of quadratic equations. Binomial theorem. Complex numbers. Algebra of complex numbers. The Argand diagram. De-Moivre's theorem, nth roots of unity. Circular measure, trigonometric functions of angles of any magnitude, addition and factor formulae.



COS 101: Introduction to Computing Sciences

(3 Units C: LH 30; PH 45)

Learning Outcomes

At the end of the course, students should be able to:

1. explain basic components of computers and other computing devices;
2. describe the various applications of computers;
3. explain information processing and its roles in the society;
4. describe the Internet, its various applications and its impact;
5. explain the different areas of the computing discipline and its specialisations; and
6. demonstrate practical skills on using computers and the internet.

Course Contents

Brief history of computing. Description of the basic components of a computer/computing device. Input/Output devices and peripherals. Hardware, software and human ware. Diverse and growing computer/digital applications. Information processing and its roles in society. The Internet, its applications and its impact on the world today. The different areas/programs of the computing discipline. The job specialisations for computing professionals. The future of computing.

Lab Work: Practical demonstration of the basic parts of a computer. Illustration of different operating systems of different computing devices including desktops, laptops, tablets, smart boards and smart phones. Demonstration of commonly used applications such as word processors, spreadsheets, presentation software and graphics. Illustration of input and output devices including printers, scanners, projectors and smartboards. Practical demonstration of the Internet and its various applications. Illustration of browsers and search engines. How to access online resources.

PHY 101: General Physics I (Mechanics)

(2 Units C: LH 30)

Learning Outcomes

At the end of the course, student should be able to;

1. identify and deduce the physical quantities and their units;
2. differentiate between vectors and scalars;
3. describe and evaluate motion of systems on the basis of the fundamental laws of mechanics;
4. apply Newton's laws to describe and solve simple problems of motion;
5. evaluate work, energy, velocity, momentum, acceleration, and torque of moving or rotating objects;
6. explain and apply the principles of conservation of energy, linear and angular momentum;
7. describe the laws governing motion under gravity; and
8. explain motion under gravity and quantitatively determine behaviour of objects moving under gravity.

Course Contents

Space and time. Units and dimension, Vectors and Scalars. Differentiation of vectors: displacement, velocity and acceleration. Kinematics. Newton laws of motion (Inertial frames, Impulse, force and action at a distance, momentum conservation). Relative motion. Application of Newtonian mechanics. Equations of motion. Conservation principles in physics. Conservative forces. Conservation of linear momentum. Kinetic energy and work. Potential energy. System of particles. Centre of mass. Rotational motion: Torque, vector product, moment, rotation of



coordinate axes and angular momentum. Polar coordinates. Conservation of angular momentum. Circular motion. Moments of inertia. gyroscopes and precession. Gravitation: Newton's Law of Gravitation. Kepler's Laws of Planetary Motion. Gravitational Potential Energy. Escape velocity. Satellites motion and orbits.

PHY 102: General Physics II (Electricity & Magnetism)

(2 Units C: LH 30)

Learning Outcomes

At the end of this course, the student should be able to:

1. describe the electric field and potential, and related concepts, for stationary charges;
2. calculate electrostatic properties of simple charge distributions using Coulomb's law, Gauss's law and electric potential;
3. describe and determine the magnetic field for steady and moving charges;
4. determine the magnetic properties of simple current distributions using Biot-Savart and Ampere's law;
5. describe electromagnetic induction and related concepts, and make calculations using Faraday and Lenz's laws;
6. explain the basic physical of Maxwell's equations in integral form;
7. evaluate DC circuits to determine the electrical parameters; and
8. determine the characteristics of ac voltages and currents in resistors, capacitors, and Inductors.

Course Contents

Forces in nature. Electrostatics; electric charge and its properties, methods of charging. Coulomb's law and superposition. electric field and potential. Gauss's law. Capacitance. Electric dipoles. Energy in electric fields. Conductors and insulators, current, voltage and resistance. Ohm's law and analysis of DC circuits. Magnetic fields. Lorentz force. Biot-Savart and Ampère's laws. magnetic dipoles. Dielectrics. Energy in magnetic fields. Electromotive force. Electromagnetic induction. Self and mutual inductances. Faraday and Lenz's laws. Step up and step-down transformers: Maxwell's equations. Electromagnetic oscillations and waves. AC voltages and currents applied to inductors, capacitors, resistance, and combinations.

PHY 107: General Practical Physics I

(1 Unit C: PH 45)

Learning Outcomes

At the end of the course, the student should be able to;

1. conduct measurements of some physical quantities;
2. make observations of events, collect and tabulate data;
3. identify and evaluate some common experimental errors;
4. plot and analyse graphs; and
5. draw conclusions from numerical and graphical analysis of data.



Course Contents

This introductory course emphasises quantitative measurements. The treatment of measurement errors, and graphical analysis. A variety of experimental techniques should be employed. The experiments include studies of meters, the oscilloscope, mechanical systems, electrical and mechanical resonant systems. Light. Heat. Viscosity and many others, covered in PHY 101 and PHY 102. However, emphasis should be placed on the basic physical techniques for observation, measurements, data collection, analysis and deduction.

PHY 108: General Practical Physics II

(1 Unit C: PH 45)

Learning Outcomes

At the end of this course, the student should be able to:

1. conduct measurements of some physical quantities;
2. make observations of events, collect and tabulate data;
3. identify and evaluate some common experimental errors;
4. plot and analyse graphs;
5. draw conclusions from numerical and graphical analysis of data; and
6. prepare and present practical reports.

Course Contents

This practical course is a continuation of PHY 107 and is intended to be taught during the second semester of the 100 level to cover the practical aspect of the theoretical courses that have been covered with emphasis on quantitative measurements. The treatment of measurement errors, and graphical analysis. However, emphasis should be placed on the basic physical techniques for observation, measurements, data collection, analysis and deduction.

200 Level

GST 212: Philosophy, Logic and Human Existence

(2 Units C: LH 30)

Learning Outcomes

A student who has successfully gone through this course should be able to:

1. discuss the basic features of philosophy as an academic discipline;
2. identify the main branches of philosophy & the centrality of logic in philosophical discourse;
3. state the elementary rules of reasoning;
4. distinguish between valid and invalid arguments;
5. think critically and assess arguments in texts, conversations and day-to-day discussions;
6. critically assess the rationality or otherwise of human conduct under different existential conditions;
7. develop the capacity to extrapolate and deploy expertise in logic to other areas of knowledge; and
8. guide his or her actions, using the knowledge and expertise acquired in philosophy and logic.

Course Contents

Scope of philosophy; notions, meanings, branches and problems of philosophy. Logic as an indispensable tool of philosophy. Elements of syllogism, symbolic logic— the first nine rules of inference. Informal fallacies, laws of thought, nature of arguments. Valid and invalid arguments, logic of form and logic of content — deduction, induction and inferences. Creative and critical



thinking. Impact of philosophy on human existence. Philosophy and politics, philosophy and human conduct, philosophy and religion, philosophy and human values, philosophy and character molding and many others.

ENT 211: Entrepreneurship and Innovation

(2 Units C: LH 15)

Learning Outcomes

At the end of this course, the student should be able to:

1. explain the concepts and theories of entrepreneurship, intrapreneurship, opportunity seeking, new value creation, and risk taking;
2. state the characteristics of an entrepreneur;
3. analyse the importance of micro and small businesses in wealth creation, employment, and financial independence;
4. engage in entrepreneurial thinking;
5. identify key elements in innovation;
6. describe stages in enterprise formation, partnership and networking including business planning;
7. describe contemporary entrepreneurial issues in Nigeria, Africa and the rest of the world; and
8. state the basic principles of e-commerce.

Course Contents

Concept of Entrepreneurship (Entrepreneurship, Intrapreneurship/Corporate Entrepreneurship). Theories. Rationale and relevance of Entrepreneurship (Schumpeterian and other perspectives, risk-taking, necessity and opportunity-based entrepreneurship and creative destruction). Characteristics of Entrepreneurs (opportunity seeker, risk taker, natural and nurtured, problem solver and change agent, innovator and creative thinker). Entrepreneurial thinking (Critical thinking, reflective thinking, and creative thinking). Innovation (concept of innovation, dimensions of innovation, change and innovation, knowledge and innovation). Enterprise formation, partnership and networking (basics of business plan, forms of business ownership, business registration and forming alliances and joint ventures). Contemporary Entrepreneurship Issues (knowledge, skills and technology, intellectual property, virtual office, networking). Entrepreneurship in Nigeria (Biography of inspirational Entrepreneurs, youth and women entrepreneurship. Entrepreneurship support institutions. Youth enterprise networks and environmental and cultural barriers to entrepreneurship). Basic principles of e-commerce.

ANA 203: General and Systemic Embryology

(2 Units C: LH 30)

Learning Outcomes

At the end of this course, the student should be able to:

1. explain how the embryo is formed from the zygote;
2. discuss the role of cleavage and gastrulation in animal development;
3. demonstrate understanding of embryology and significance of prenatal diagnostic methods;
4. describe structural features of primordia in tissue and organs at different developmental stages;
5. define risk periods in histogenesis and organogenesis; and
6. analyse the most often observed developmental anomalies.



Course Contents

Spermatogenesis, oogenesis; ovarian follicles; ovulation; corpus luteum; menstruation; uterine cycle; hormonal control of uterine cycle; fertilization; cleavage; implantation; reproductive technologies-IVF/surrogacy/embryo transfer; embryo manipulation & potency/twinning; molecular embryology and transgenesis; gastrulation; notochord, neurulation; derivatives of the germ layers; folding of the embryo; fetal membranes; placenta; development of limbs and teratology. Growth and perinatology; congenital malformations – general introduction. The cardiovascular system, skin, structure of the nails and hair. Macrophagic system; cellular immunology; lymphoid organs; glands – endocrine and exocrine. Respiratory system. Digestive system. Urinary and genital systems. Electron micrograph studies of each organ.

ANA 201: Anatomy of Upper and Lower Limb

(3 Units C: LH 30; PH 45)

Learning Outcomes

At the end of this course, the student will be able to:

1. define fundamental anatomical terminology and discuss the anatomical position;
2. describe the anatomy of the musculoskeletal system, including the axial skeleton; appendicular skeleton, appendicular and axial muscles, and arthrology;
3. describe the general features of the bones of the upper and lower limbs;
4. identify the major muscles of the upper and lower limbs;
5. explain the types and structure of the joints of the upper and lower limbs;
6. correlate between the attachment of the muscles and their functions on the different joints;
7. identify the major nerves of the upper and lower limbs;
8. describe the functional components of each of the major nerves and its distribution;
9. identify and describe the course of the major superficial veins of the upper and lower limbs; and
10. name the major arteries of the upper and lower limbs.

Course Contents

Descriptive terms, planes and terms of relationship of the human body, terms of comparison, attachment of muscles, types of muscles, movements of joints. Osteology, principles of kinesiology, general organisation of body system. Cutaneous innervation of the upper limb; pectoral region; breast; axilla; shoulder region; arm and cubital fossa; flexor compartment of forearm; extensor compartment of forearm; hand; venous and lymphatic drainage of the upper limb. Applied anatomy of nerves; blood supply of the upper limb. Cutaneous innervation of the lower limb; femoral triangle; adductor canal and medial side of the thigh; gluteal region; back of the thigh, popliteal fossa; extensor compartment of the leg and dorsum of the foot; peroneal and flexor compartment of the leg; sole of the foot, arches of the foot; mechanism of walking; venous and lymphatic drainage of the lower limb; applied anatomy of the nerves and blood supply to the lower limb.



POI 201: Introductory to Physiology and Blood

(2 Units C: LH 30)

Learning Outcomes

At the end of this course, the student should be able to:

1. describe the composition of a cell membrane;
2. explain how a potential difference across a membrane will influence the distribution of a cation and an anion;
3. describe how transport rates of certain molecules and ions are accelerated by specific membrane transport proteins;
4. distinguish between active (primary and secondary) transport, facilitated diffusion, and passive diffusion based on energy source and carrier protein involvement;
5. identify the mechanisms and role of selective transporters for amino acids, neurotransmitters, nutrients, etc.;
6. explain the general concepts of homeostasis and the principles of positive and negative feedback in physiological systems;
7. identify the site of erythropoietin production, the stimulus for its release, and the target tissue for erythropoietin action;
8. discuss the normal balance of red blood cell synthesis and destruction, including how imbalances in each lead to anemia or polycythemia;
9. list and differentiate the various types of leukocytes;
10. describe the role of thrombocytes in haemostasis; and
11. list clotting factors and the discuss the mechanism of anti-coagulants.

Course Contents

Introduction and history of physiology. Structure and functions of cell membranes. Transport process. Special transport mechanism in amphibian bladder, kidney, gall bladder, intestine, astrocytes and exocrine glands. Biophysical principles. Homeostasis and control systems including temperature regulation. Biological rhythms. Composition and functions of blood. Haemopoiesis. WBC and differential count. Plasma proteins Coagulation, fibrinolysis and platelet functions. Blood groups – ABO system – Rh system. Blood transfusion – indication for collection and storage of blood, hazards of blood transfusions. Reticulo- endothelial system. Immunity and immunodeficiency disease and HIV.

BCH 201: Biochemistry – General and Medical I

(2 Units C: LH 30)

Learning Outcomes

At the end of this course, the student will be able to:

1. explain the structure of different macromolecules in biological system;
2. identify types of chemical reactions involving these macromolecules;
3. explain the various methods of isolation of these macromolecules;
4. estimate the effects of acids and alkalis on the macromolecules;
5. describe purification of macromolecules; and
6. discuss quantification of the various macromolecules.



Course Contents

Introductory chemistry of amino acids, their properties, reactions and biological functions. Classification of amino acids: neutral, basic and acidic; polar and non-polar; essential and non-essential amino acids. Peptides. Introductory chemistry and classification of proteins. Biological functions of proteins. Methods of their isolation, purification and identification. Primary, secondary, tertiary and quaternary structures of proteins. Basic principles of tests for proteins and amino acids. Introductory chemistry of carbohydrates, lipids and nucleic acids. Nomenclature of nucleosides and nucleotides, effects of acid and alkali on hydrolysis of nucleic acids.

NSC 201: Foundations of Professional Nursing Practice I (2 Units C: LH 15; PH 45)

Learning Outcomes

At the end of this course, the student should be able to:

1. explain the nature of nursing and the trend towards the emergence of professional practice;
2. discuss the professional context of nursing practice with relevance to education, ethics and professional behaviours, and scientific basis of nursing practice;
3. discuss the concepts of health, healthcare delivery systems and contributions of government, non-governmental and international organisations to health care delivery;
4. discuss the components and use of nursing process and nursing care plan; and
5. demonstrate moderate competence in basic nursing skills covered as part of the core knowledge areas.

Course Contents

Fundamental concepts in nursing as a practice profession. Concept of health, illness and healthcare at the three levels of service delivery. The concept and nature of nursing with attention to the history and emergence of nursing as a profession. Nursing Associations and their roles. The attributes of Nursing. The Nursing Process. Outline, components, including North American Nursing Diagnosis Association (NANDA) list and the NANDA Nursing Interventions' Classification (NIC), and the Nursing Outcomes Classification (NOC). Use of nursing process in care of patients. Nursing theories and models. Values and nursing ethics and etiquettes. The role of nurses within organisational and professional ethical prescriptions. Understanding scientific basis of nursing care. Health and diseases in a socio-cultural context. The central placement of the nurse as a practitioner and a member of the health care team in the context of health care delivery system. Comfort, safety and hygiene in nursing care. Basic procedures in nursing such as bed making, bathroom and bed bath, food service, and vital signs. Skills acquisition and laboratory demonstrations of basic nursing skills prior to exposure to clinical practice.

NSC 203: Developmental Psychology

(1 Unit C: LH 15)

Learning Outcomes

At the end of this course, the student should be able to:

1. describe the developmental stages of man and influence on individual behaviour;
2. explain the quantitative adjustments that are related to growth and development in individuals;
3. associate the developmental stages of individuals with their social expectations; and
4. identify the methods to deal with health challenges of different ages and implications for nursing and society.



Course Contents

Human growth and development from conception through childhood and adolescence to old age. Erikson's developmental tasks for different stages of life. Theories of Learning. Psychology of Learning and the nurse. The nature and structure of intelligence. Individual differences. Environment and behaviour. Determinants of human health behaviour. Attitudes. Psychological influence on health and illness. Care and coping strategies in illness situations especially for children, adolescents and the elderly.

PIO 212: Renal and Body Fluids Physiology

(2 Units C: LH 30)

Learning Outcomes

At the end of this course, the student should be able to:

1. sketch a cross section of a kidney; identify the renal cortex, renal medulla, renal calyces, medullary pyramids, renal pelvic space, renal artery, renal vein, and ureter;
2. describe renal blood flow, renal plasma flow, glomerular filtration rate, and filtration fraction and list typical values;
3. explain the concept of renal clearance. Use the clearance equation and an appropriate compound to estimate the glomerular filtration rate, renal plasma flow, and renal blood flow;
4. describe the effects of reductions in GFR on plasma creatinine concentrations and plot the relationship;
5. discuss the role of the ascending limb of the loop of Henle in producing a high renal interstitial fluid osmolality. From the loop of Henle, contrast the tubular fluid and interstitial fluid osmolality changes that allow either a dilute or a concentrated urine to be produced and excreted;
6. describe processes that lead to acid-base disturbances and list the common causes;
7. identify major routes and normal ranges for water intake and loss, and predict how changes in intake and loss affect the distribution of total body water.
8. list the various body fluid compartments and their ionic compositions
9. describe the methods used in measuring the body fluid compartments and
10. discuss the role of the kidney in maintaining homeostasis of body fluids

Course Contents

Macroscopic, microscopic and ultra-structure of the kidney. Elements of renal functions. Glomerular filtration. Concept of clearance. Tubular reabsorption and secretion. Renal blood flow. Body fluid and electrolyte balance. Buffer mechanism and pH regulation. Counter-current system. Micturition. Abnormalities of renal functions. Composition and estimation of body fluid compartments. Concept of water and electrolyte balance. Role of the kidney in body fluid homeostasis.



ANA 204: Anatomy of Thorax, Abdomen, Pelvis & Perineum (3 Units C: LH 30; PH 45)

Learning Outcomes

At the end of the course, students should be able to:

1. identify the bones and bony markings of the thorax, abdomen, pelvis and perineum;
2. list the nine regions and four quadrants and the principal organs and structures that lie deep to them and which can be palpated in those regions;
3. describe the muscular components of the anterior abdominal wall, blood supply and innervation of the anterior abdominal wall;
4. identify the arteries, veins and lymphatics of the thorax, abdomen, pelvis and perineum; be able to list the main branches of the aorta and their territories; and describe the disposition of the main veins in the abdomen;
5. describe the parts, position, vertebral levels and surface markings of the stomach and duodenum as well as the position, vertebral levels and surface markings of the pancreas, spleen, liver and gall bladder;
6. describe the greater and lesser omenta and the lesser sac;
7. describe the disposition of the jejunum and ileum; describe the surface anatomy of the caecum, ascending colon, transverse colon, descending colon and sigmoid colon;
8. describe the anatomy of the pelvic diaphragm, its midline raphe, perineal body, attachment points and the structures passing through it in males and females;
9. describe the anatomy of the ischio-anal fossa;
10. describe the anatomy and relations of the ovary, uterine tubes, uterus, cervix and vagina, including their peritoneal coverings;
11. describe the anatomy and neurovascular supply of the clitoris, vulva and vagina; the anatomy of the urogenital diaphragm and perineal 'pouches';
12. describe the origin, course and distribution of the pudendal nerves and the sites of pudendal nerve block;
13. describe the lymphatic drainage of the foregut, pelvic and perineal organs;

Course Contents

Introduction to the trunk; thoracic cage; intercostal space; thoracic cavity; pleural cavities; lungs; mediastinum general; anterior & superior mediastinum; middle; mediastinum – heart and pericardium; heart – applied anatomy; posterior mediastinum. General anatomy of abdomen and abdominal regions; anterior abdominal wall muscles; inguinal canal – inguinal and femoral hernias; peritoneal cavity and spaces; abdominal oesophagus, stomach, duodenum, spleen, small intestine, large intestine, appendix; portal venous system; portocaval anastomoses; liver and gallbladder. Pancreas and biliary apparatus; kidneys, suprarenal glands, and ureters; diaphragm; posterior abdominal wall; aorta and inferior vena cava; posterior abdominal wall muscles; lumbosacral plexus; bony and ligamentous pelvis; pelvic diaphragm (floor); male reproductive organs; female reproductive organs; male and female external genitalia; perineum; rectum and anal canal; pelvic blood vessels; abdomino-pelvic nervous system.



BCH 202: Biochemistry – General and Medical II

(2 Units C: LH 30)

Learning Outcomes

At the end of this course, the student should be able to:

1. explain the structure of the cell including its components;
2. discuss the interrelationship between different organelles of the cell;
3. recognise the differences between plant and animal cells;
4. isolate the various organelles of both plant and animal cells; and
5. describe the influence of hydrogen ion concentration on cellular function.

Course Contents

The cell theory. Structures and functions of major cell components. Cell types, constancy and diversity. Cell organelles of prokaryotes and eukaryotes. Chemical composition of cells. Centrifugation and methods of cell fractionation. Structure, function and fractionation of extra-cellular organelles. Water, total body water and its distribution. Regulation of water and electrolyte balance. Disorder of water and electrolyte balance. Acidity and alkalinity, pH and pK values and their effects on cellular activities.

BCH 203: General Biochemistry Practical

(1 Unit: C PH 45)

Learning Outcomes

At the end of the course, students will be able to describe the various laboratory procedures used in the study of various biochemical processes described in BCH 201 and 202.

Course Contents

Laboratory experiments designed to reflect the topics covered in BCH 201 and BCH 202. Introduction to laboratory methods and procedures employed in studying biochemical processes.

NSC 202: Foundations of Nursing II

(2 Units C: LH 15; PH 45)

Learning Outcomes

At the end of this course, the student should be able to:

1. explain the communication process and relevance of effective communication in patient care;
2. discuss the theoretical basis for needs of patients;
3. explain the role of the nurse in helping clients meet basic needs for health;
4. describe measures appropriate for modification of patients' environment of care;
5. apply safety and comfort measures to meet needs of patients;
6. demonstrate proficiency in observation, reporting and recording; and
7. educate patients on the basic tenets of healthy living.

Course Contents

Client teaching and learning environment. Communication in health care. Assessment of vital signs. Asepsis. Skin integrity and wound care. Theories in nursing. Needs of patients and actions to meet such needs including promotion of physical health, physical activity, exercise and sleep. Nutrition for improved health. Administration of drugs (oral, injection and other routes). Intravenous infusions. Blood transfusion. Body physiological processes including elimination, oxygenation and circulation. The basic nursing procedures. Administration of oxygen. Care of tracheostomy. Nasogastric tube feeding. Cardiopulmonary resuscitation (CPR). Laboratory



practical and demonstration for clinical skills of basic nursing procedures. Pre and postoperative care.

NSC 206: General and Cellular Pathology

(2 Units C: LH 30)

Learning Outcomes

At the end of this course, the student should be able to:

1. describe the basic cellular events that lead to disease;
2. explain the processes such as inflammation, infection, necrosis and many others;
3. recognise the presenting cellular and physiological signs of diseases such in cancers and certain genetic disorders; and
4. discuss the progression and effects of cellular pathologies.

Course Contents

General mechanisms. The pathogenesis of disease and the dynamic nature of disease as it evolve from its incipient stage to its full expression. The effect of disease on organs and distant parts of the body. Pathology and the nature of disease. Chemistry of cell damage and the dying cell. Inflammation and infection. Inflammatory response and chemical mediators. Immunity and cellular immune response. Principles of repair and re-organisation of cell structure. Cancers and genetic diseases, progression and implications to nursing.

300 Level

GST 312: Peace and Conflict Resolution

(2 Units C: LH 30)

Learning Outcomes

At the end of the course, students should be able to:

1. analyse the concepts of peace, conflict and security;
2. list major forms, types and root causes of conflict and violence;
3. differentiate between conflict and terrorism;
4. enumerate security and peace building strategies; and
5. describe roles of international organisations, media and traditional institutions in peace building.

Course Contents

Concepts of Peace, Conflict and Security in a multi-ethnic nation. Types and Theories of Conflicts: Ethnic, Religious, Economic, Geo-political Conflicts; Structural Conflict Theory, Realist Theory of Conflict, Frustration-Aggression Conflict Theory. Root causes of Conflict and Violence in Africa: Indigene and settlers Phenomenon; Boundaries/boarder disputes; Political disputes; Ethnic disputes and rivalries; Economic Inequalities; Social disputes; Nationalist Movements and Agitations; Selected Conflict Case Studies – Tiv-Junkun; ZangoKartaf, Chieftaincy and Land disputes and many others. Peace Building, Management of Conflicts and Security: Peace & Human Development. Approaches to Peace & Conflict Management --- (Religious, Government, Community Leaders and many others.). Elements of Peace Studies and Conflict Resolution: Conflict dynamics assessment Scales: Constructive & Destructive. Justice and Legal framework: Concepts of Social Justice; The Nigeria Legal System. Insurgency and Terrorism. Peace Mediation and Peace Keeping. Peace & Security Council (International, National and Local levels) Agents of Conflict resolution – Conventions, Treaties Community Policing: Evolution and Imperatives.



Alternative Dispute Resolution, ADR. Dialogue). Arbitration, c). Negotiation d). Collaboration and many others. Roles of International Organisations in Conflict Resolution. (a). The United Nations, UN and its Conflict Resolution Organs. (b). The African Union & Peace Security Council (c). ECOWAS in Peace Keeping. Media and Traditional Institutions in Peace Building. Managing Post-Conflict Situations/Crisis: Refugees. Internally Displaced Persons, IDPs. The role of NGOs in Post-Conflict Situations/Crisis

ENT 312: Venture Creation

(2 Units C: LH 15; PH 45)

Learning Outcomes

At the end of this course, students, through case study and practical approaches, should be able to:

1. describe the key steps in venture creation;
2. spot opportunities in problems and in high potential sectors regardless of geographical location;
3. state how original products, ideas, and concepts are developed;
4. develop business concept for further incubation or pitching for funding;
5. identify key sources of entrepreneurial finance;
6. implement the requirements for establishing and managing micro and small enterprises;
7. conduct entrepreneurial marketing and e-commerce;
8. apply a wide variety of emerging technological solutions to entrepreneurship; and
9. appreciate why ventures fail due to lack of planning and poor implementation.

Course Contents

Opportunity Identification (Sources of business opportunities in Nigeria, Environmental scanning, Demand and supply gap/unmet needs/market gaps/Market Research, Unutilised resources, Social and climate conditions and Technology adoption gap). New business development (business planning, market research). Entrepreneurial Finance (Venture capital, Equity finance, Micro finance, Personal savings, Small business investment organisations and Business plan competition). Entrepreneurial marketing and e-commerce (Principles of marketing, Customer Acquisition & Retention, B2B, C2C and B2C models of e-commerce, First Mover Advantage, E-commerce business models and Successful E-Commerce Companies,). Small Business Management/Family Business: Leadership & Management, Basic book keeping, Nature of family business and Family Business Growth Model. Negotiation and Business communication (Strategy and tactics of negotiation/bargaining, Traditional and modern business communication methods). Opportunity Discovery Demonstrations (Business idea generation presentations, Business idea Contest, Brainstorming sessions, Idea pitching). Technological Solutions (The Concept of Market/Customer Solution, Customer Solution and Emerging Technologies, Business Applications of New Technologies - *Artificial Intelligence (AI)*, *Virtual/Mixed Reality (VR)*, *Internet of Things (IoTs)*, *Blockchain*, *Cloud Computing*, *Renewable Energy* and many others. Digital Business and E-Commerce Strategies).



PHA 301: Pharmacodynamics and Chemotherapy I

(2 Units C: LH 30)

Learning Outcomes

At the end of this course, the student should be able to:

1. discuss sources, classifications of drugs, chemical, generic and trade names;
2. identify the basic principles of pharmacology, drug uses including side effects and contra indications as they apply to the human body systems;
3. explain the ethical and legal aspects concerning drug administration;
4. identify resources for up-to-date information on drugs and medication used within clinical practice (different drug formularies)/DRF;
5. utilise knowledge acquired in drug dosage calculations and administration;
6. explain the indications, actions, dosage, route of administration and side effects of drugs considered in this course;and
7. explain the role of the nurse in pharmacovigilance and adverse event reporting.

Course Contents

Drug derivations, sources, classifications. Pharmacology –basic principles, uses of drugs. Pharmacodynamics and pharmacokinetics. Drug actions and functions of drugs in the body systems. Routes of drugs administration (oral, parenteral, intrathecal, and other routes). Drugs for prophylaxis and control of bacterial, parasitic and viral infections. Chemotherapy for parasitic infections. Therapeutic drugs and their action on cells. Different lotions and their uses; toxicology and drug abuse. Nurses role in drug therapy. Patient safety issues through pharmacovigilance and reporting of adverse events. The National Drug Policy and Drug Revolving Fund (DRF). Problems of drug therapy and the contributions of traditional chemotherapeutic measures to health maintenance. Administration of controlled drugs and substances (DDA).

NSC 301: Epidemiology

(1 Unit C: LH 15)

Learning Outcomes

At the end of this course, the student should be able to:

1. define key concepts and principles in epidemiology (such as determinants, prevalence, incidence, surveillance, type of epidemiologic studies and many others);
2. discuss epidemiological triad, models and applications;
3. describe the epidemiology of communicable and non-communicable diseases including sexually transmitted infections and HIV; and
4. explain the role of the nurse in Integrated Disease Surveillance and Response (IDSR).

Course Contents

Concepts and definition of terms in epidemiology. Purpose of epidemiology. Relationship in epidemiological triad. Epidemiological models and application. Epidemiological study designs and types. Application of epidemiology to communicable and non-communicable diseases. Measuring and interpreting patterns of disease occurrence. Routine sources of data. Communicable diseases (such as diseases of contact and droplets, water and food related,diseases spread by insects and other animals and many others) and their management. Non communicable diseases. HIV and sexually transmitted infections/diseases. Use of Integrated Disease Surveillance and Response (IDSR) Framework.



NSC 303: Community/Public Health Nursing I

(2 Units C: LH 30)

Learning Outcomes

At the end of this course, the student should be able to;

1. discuss the trend of the emergence of the practice of community/public health;
2. discuss the context of the family as the unit of care in community/public health nursing;
3. discuss the relevant concepts, tools and theories used in family health assessment and care;
4. explain the concept and process of community actions in practice;
5. describe the levels of prevention and application development of programmes and services in community/public health nursing practice; and
6. demonstrate effective use of nursing process in programme and service delivery at the community level.

Course Contents

Historical antecedents of community/public health nursing practice. Role of community/public health nurses in the diverse community settings. The context of family as the unit of care in the community. Concept of the family. Types and characteristics of families. Family developmental tasks. Family nursing theories. Tools in family health assessment and family care. Demography and population dynamics. Community assessment. Community mobilization, participation and involvement. Levels of prevention. Nursing process as applied to community practice. Skills used in community practice. Levels of health prevention. Socio-demographic variables and population dynamics as predictors of patterns of life in the community. Patterns of diseases in the community. Application of development programmes and services at community levels.

NSC 307: Human Nutrition

(2 Units C: LH 30)

Learning Outcomes

At the end of this course, the student should be able to:

1. discuss food classes, sources and their functions;
2. explain terminologies associated with nutrition in health and illness;
3. discuss the criteria for food selection, preservation, preparation and budgeting; and
4. discuss the relationship between nutrition and disease control and management.

Course Contents

Historical perspectives of nutrition as a science. Food classes (organic and inorganic) and their functions. Food nutrients. Relationship of digestion and absorption of food to health. Nutrient quality of local foods and diets. Factors affecting choice of food such as culture, religion, socioeconomic status, food availability, health status, natural disasters and political instability. Food selection/choice, purchasing, preservation, preparation and budgeting. Diet therapy for control and treatment of disease conditions. Planning and provision of special therapeutic diets to clients and patients. Nutrition education. Use of nutritional supplements. Factors that affect nutrition. Diet, food habits and choice. Selection and formulation of balanced and weaning diets. Use of food composition tables. Nutrient requirements and recommended daily calorie requirements (RDA)/micronutrient requirements. Food in relation to the life cycle. The role of the nurse in promotion of good nutrition in hospital (in and out patient), schools, and community.



NSC 309: Nursing Ethics and Jurisprudence

(2 Units C: LH 30)

Learning Outcomes

At the end of this course, the student should be able to:

1. explain concept of ethics, law, morals and many others;
2. discuss relevant issues in the nursing code of ethics (national, international) and the regulation of nursing practice;
3. explain the rights and responsibilities in patient care and the legal roles of the nurse;
4. discuss area of legal liabilities in nursing and legal protection for the nurse;
5. explain ethical dilemmas/problems and different models of ethical decision making in nursing;
6. recognise the boundaries of nursing care within the general healthcare process; and
7. utilise ethical decision making models for resolution of ethical dilemma in practice.

Course Contents

Nursing ethics and ethical issues in the practice of nursing; personal philosophy of nursing. The national code of ethics for Nigeria. The International Council of Nurses (ICN) Code. Principles of ethics. Relationship with the patients and other members of the health team. Introduction to the laws and statutes as they affect the nursing profession and practice. Patients' Bill of Rights. Professional negligence and malpractice. Acts. Legal rights, duties and liabilities. Informed consent. Litigations. Ethical dilemmas in practice. Sex change. Abortion. Euthanasia. Dying and death. The nurse as advocate and nurse as witness.

NSC 313: Medical & Surgical Nursing I

(2 Units C: LH 15; PH 45)

Learning Outcomes

At the end of this course, the student should be able to:

1. explain basic concepts and terminologies in medical surgical nursing;
2. conduct appropriate assessment of medical and surgical patients utilising relevant tools;
3. demonstrate competence in preparation of patients for diagnostic measures in medical and surgical conditions;
4. identify needs/problems of patients with medical and surgical conditions; and
5. utilise knowledge, skills and appropriate attitudes in the management of patients with medical and surgical conditions using the nursing process.

Course Contents

Review of anatomy and physiology of organs concerned. Basic concept and terminologies of medical and surgical conditions. Health care delivery systems and models of health care. Concept of adaptation and conditions that threaten adaptation/ disrupted homeostasis and psycho physiologic response to illnesses. Disrupted homeostasis and psycho physiologic response to illnesses and nursing interventions. Diagnostic measures in medical and surgical conditions. Evidence-based nursing. Concept and principles of rehabilitation. Critical thinking. Ethical decision making, Use of nursing process as framework for practice. Skin care and wound management. Nursing care of selected medical and surgical conditions.



NSC 302: Community/Public Health Nursing II

(2 Units C: LH 30)

Learning Outcomes

At the end of the course, the student should be able to:

1. discuss socio-cultural, economic, political and environmental factors influencing individual, family, community and global health;
2. discuss models of community health practice;
3. discuss the principles and theories of health promotion;
4. demonstrate skills in health counseling;
5. discuss the concept, historical antecedents, elements, principles and components of Primary Health care;
6. discuss the Immunisation Schedules; and
7. discuss the historical antecedents and contents of special programmes for Child Health promotion.

Course Contents

Working in and with the community. Skills and attitudinal disposition to analyse the socio-cultural, political, economic, ethical and environmental factors that influence individual, family, community and global health. Models for community health practice, principles and theories of health promotion. Health counselling. Primary Health Care (PHC) – concept, elements, principles, components and service delivery. Child welfare services. Immunisation Schedules/Vaccination of under-five children and adults. The Cold Chain Systems. Special Programmes in Child Health Growth monitoring, oral rehydration, breast-feeding and immunization - Female education, Family spacing and food supplementation (GOBI-FFF). Integrated Management of Neonatal and Childhood diseases (IMNCI). School health services. Disaster nursing. Primary oral health care principles.

NSC 306: Medical & Surgical Nursing II

(2 Units C: LH 15; PH 45)

Learning Outcomes

At the end of this course, the student should be able to:

1. demonstrate an understanding of conditions affecting the systems identified with associated review of their respective normal functions and pathophysiologies;
2. describe signs and symptoms of disorders of the systems involved and the associated nursing and medical management;
3. explain diagnostic measures for medical and surgical conditions of the organs and systems covered in this course;
4. discuss neoplasms, benign and malignant growths, and pain in the systems; and
5. utilise the nursing process in care of patients with different medical and surgical conditions.

Course Contents

Review of anatomy, physiology and pathophysiology as they affect the systems of the body. Concept of oxygenation and disturbances of oxygen carrying mechanism. Blood pumping mechanism and blood vessel distribution. Anatomic physiologic overview of the respiratory system. Disorders of the respiratory system. Nursing care and management of patients with disorders of the respiratory system. Anatomic and physiologic overview of the cardiovascular system. Disorders of the cardiovascular system. Nursing care and management of patients with disorders of the cardiovascular system. Vascular disorders and inflammatory responses.



Gastrointestinal system disorders. Metabolic disorders of ingestion, digestion and elimination. Genitourinary system disorders and management. Hepatic functions and disorders. Glucose metabolism and hormonal disorders. Nutritional disorders. Pathophysiology of cell proliferation and maturation, and neoplastic disorders. Care of patients with cancer and pain management. Medical care and nursing management of client/patients with specific acute and chronic medical and surgical conditions.

NSC 308: Medical Surgical Nursing III

(2 Units C: LH 30)

Learning Outcomes

At the end of this course, the student should be able to:

1. discuss the disease conditions affecting the organs and systems covered in this course with associated review of the normal functions and pathophysiology;
2. explain diagnostic measures for medical and surgical conditions of the organs and systems covered in this course;
3. discuss immune disorders and their management;
4. explain the role of the nurse in the pre, intra and operative care of the surgical patient;
5. discuss the care and nursing management of patients in shock, unconscious patient, burns and other conditions;
6. utilise nursing process in care of patients with varying medical and surgical conditions;
7. discuss the special role of the nurse in the care of patients with disorders of the male and female reproductive system;
8. demonstrate skills in triaging in emergency and disaster situations; and
9. explain the special roles of the nurse in palliative and end of life care.

Course Contents

Anatomic and physiologic overview of the immune system. Disorders of the immune system, nursing care and management of patients with immune diseases. Musculo-skeletal system disorders (Orthopaedics) and the skin. Burns. Disorders of the special senses (eye, ear, nose, and throat). Disorders of the male and female reproductive system. Sexually transmitted infections. Nervous system disorders. Shock. Endocrine system and associated disorders. Role of the nurse in acute and chronic states of diseases of the mentioned systems. The course also deals with perioperative concepts and care. Emergency and disaster care. Unconscious patient. Patients undergoing surgical and special procedures. Care of the elderly, palliative and end of life care. Nurse's role in the special units - operating theatre, intensive care unit, eye ward, and other wards. Perioperative concepts and nursing management. Care and management of patients with special medical and surgical needs (Patients having surgery. Patients experiencing trauma. Unconscious patient. Patient with burns and many others). Care of the elderly. Palliative and end of life care.



NSC 312: (SIWES 2) - Medical Surgical Nursing Practicum II (2 Units C: PH 90)

Learning Outcomes

At the end of this clinical posting, students should be able to:

1. assist/carryout procedures such as wound dressing, client feeding, catheterisation, bed baths, and many others, as assigned to them by the supervising nurse(s);
2. develop nursing care plans for clients/patients, implement them;
3. write relevant reports on care of clients/patients and outcomes; and
4. present reports on completion of the posting as necessary.

Course Contents

Students should be posted to medical and surgical units where they are required to care for patients with diseases covered in previous medical and surgical courses. Students are expected to develop nursing care plans and implement such under the supervision of faculty, instructors, preceptors, and trained nurses on the ward. Use of case studies and presentations.

The second round of four out of twelve weeks will be spent in hospitals setting. Continuous assessment of students will be undertaken by the team from the University, Clinical Site and the ITF officials. Students will also be required on returning to the institution to present a seminar on major duties performed and skills acquired during the training. Grading for the course should give attention to ITF directives.

NSC 314: Mental Health and Psychiatric Nursing I (2 Units C: LH 30)

Learning Outcomes

At the end of the course, the student should be able to:

1. identify common causes of mental illness and predisposing factors;
2. differentiate between the features of groups of mental disorders;
3. discuss different management methods for mental disorders, including somatic therapies;
4. utilise the nursing process and DSM IV-TR multi-axial diagnosis in managing patients with mental health/psychiatric disorders in a variety of settings;
5. discuss mental health act and laws, including ethico- legal aspects of mental health; and
6. collaborate with the multidisciplinary team and multi-sectoral agencies in provision of mental health services to individuals, family and community, that includes promotion of mental health.

Course Contents

Concepts in mental health nursing and the variety of commonly occurring psychiatric conditions throughout the lifespan. The role of the nurse in the care of the mentally ill, including mental health promotion and rehabilitation in the community. Patient assessment for mental health/psychiatric disorder using the nursing process and relevant management methods. Use of the DSM – IV TR (Multiaxial System for Psychiatric Diagnosis) to evaluate and describe multiple conditions of clients. Interpersonal skills and attitudes necessary for the nurse to act as a therapeutic agent. History of the mental health movement - national and international. Classification of mental health disorders. Discussion of specific behaviours. Symptoms, signs. Intervention methods by health care providers - individual and group approach. Therapeutic care. Behaviour management. Management of different mental health disorders. Substance related disorders and management. Legal coverage (Mental Health Acts, ethical codes and patients' Bill



of rights). The legal aspects of mental health/psychiatric nursing and the nurses' role. Mental health counselling, referrals and follow ups.

PHA 302: Pharmacodynamics and Chemotherapy II

(2 Units C: LH 15; PH 45)

Learning Outcomes

At the end of this course, the student should be able to:

1. identify drugs used for the treatment and management of the listed systemic disorders - (gastrointestinal, renal, special senses, nervous musculo skeletal, reproductive, skin, endocrine and cancers and many others);
2. discuss the indications, dosages, actions, side effects, contraindications of drugs;
3. apply knowledge and skills in administration of drugs, including calculations where needed;
4. discuss nursing responsibilities and the need for safety monitoring of drugs, vaccines and other products for treatment of patients; and
5. discuss pharmacovigilance and the role of the nurse.

Course Contents

Indications, actions, dosage, routes of administration, side effects, contraindications, and nursing responsibilities for use of drugs of the listed body systems (gastrointestinal, renal, special senses, musculo skeletal, reproductive, skin, nervous, endocrine, cancers and many others). Antacids. Anthelmintics. Anticholinergics. Antibiotics. Analgesics. Anaesthetics. Antidepressants. Antidiabetics. Antithyroids. Antifungal. Anti infectives. Anticoagulants. Antihypertensives. Drugs acting on the various systems – Renal (diuretics and many others). Vasodilators. Mydriatics. Myotics. Drugs used in obstetrics and many others (List not exhaustive).

400 Level

NSC 403: Medical Surgical Nursing Practicum III

(3 Units C: PH 135)

Learning Outcomes

At the end of the clinical posting, the student should be able to:

1. prepare patients for special laboratory investigations and procedures;
2. set up trays and trolleys for care and management of patients;
3. care for both medical and surgical patients under supervision;
4. perform nursing procedures as assigned;
5. maintain fluid intake and output charts;
6. manage infusions, parenteral and other medications under supervision; and
7. undertake counselling of patients as necessary.

Course Contents

This clinical course is designed to provide students with the opportunity to develop more competence in medical and surgical care of patients. The students are posted to special units of the hospital such as renal/urinary, operating theatres, ear, nose and throat, eye, and gynaecological units for proper integration of theory into practice and for enhancing their patient care skills.



NSC 405: Maternal and Child Health Nursing I

(2 Units C: LH 30)

Learning Outcomes

At the end of the course, the student should be able to:

1. discuss the anatomical and physiological changes that are associated with pregnancy and child birth;
2. apply knowledge of preconception in the care of women and their families;
3. describe normal pregnancy, labour and puerperium;
4. describe abnormal pregnancy, labour and puerperium;
5. discuss family planning methods including factors that affect acceptance and choice of methods;
6. apply the knowledge and skills acquired to conduct physical health assessment, plan and implement care for the family with other health care providers; and
7. discuss the role of the nurse and midwife in the clinical area and the community including during immunisations.

Course Contents

Maternal and child health from conception to delivery and post-delivery. The nursing care of mothers, the newborn, and the family. Drugs used in midwifery practice. Pain management in midwifery practice. Anatomy and physiology of the male and female reproductive organs. Foetal development. Review of history of midwifery in Nigeria and worldwide. Ethics and legal issues in midwifery practice. Theories applied to midwifery practice. Basic concepts of midwifery practice. Standard nursing language and nursing process. Ethico-Legal aspect of HIV/AIDs. Quality of care in midwifery practice.

NSC 406: Curriculum Development and Teaching Methodology (2 Units C: LH 30)

Learning Outcomes

At the end of the course, the student should be able to:

1. recognise the principles of education and adapt it health education;
2. identify the roles of the nurse as a teacher and health educator;
3. identify teaching and learning methodologies and how to adapt them to health education;
4. discuss modern methods (such as use of information and communication technologies) to enhance teaching and learning; and
5. develop teaching plans and identify learning frameworks.

Course Contents

Principles of education and educational methodology. The role of the nurse as a teacher and health educator. Principles of education. Principles of teaching/learning. Philosophy and objectives of education in Nigeria. Relationship of the National Policy on Education and philosophy to the education of nurses. Qualities of a teacher. Teacher/learner interaction. The learning environment. The learner. Deductive and inductive reasoning. Concepts of motivation development of instructional objectives. Development of course content. Methods of evaluation. Traditional and modern/innovative teaching methods as they apply to health professional education. Educational technology and communication media. Development of curriculum and microteaching. Implementation of teaching plans in clinical settings (clinical/ patient teaching).



PHE 403: Biostatistics

(1 Unit C: LH 15)

Learning Outcomes

At the end of this course, the students should be able to:

1. define basic statistical terminologies;
2. explain various types of statistics and their uses;
3. differentiate between descriptive, qualitative and quantitative data);
4. utilise statistical methods to analyse, present and interpret data; and
5. communicate data analysis result based on informed decision.

Course Contents

Review of basic statistical terminologies. Discrete/categorical and continuous data. Descriptive/quantitative and qualitative data. Parameters and statistics. Parametric and non parametric statistics. Review of descriptive statistics. Inferential statistics. Errors – type 1 and type 11. Hypothesis testing. Level of significance. Degree of freedom. Inferences and conclusion from statistical analysis. Statistical packages (such as SPSS latest Ed and many others). Data organisation and interpretation - frequency distribution tables, graphs, charts, cumulative frequencies and curves. Data communication and data-informed decision making. The nurse's role in data collection and data quality.

NSC 409: Research Methodology

(2 Units C: LH 30)

Learning Outcomes

At the end of this course, the student should be able to:

1. discuss the concept of research and benefits to nursing;
2. describe the types of research;
3. discuss the steps in the research process;
4. initiate, conduct and present a research project;
5. recognise the importance of ethics in research;
6. explain the application of research findings to nursing situations; and
7. generate research proposals and conduct a simple research study in area of interest.

Course Contents

Definition of concepts. Types of research. Benefits to nursing. The steps of the research process from problem identification, through literature review to report writing. Basic skills and knowledge required of a researcher. Conduct of simple studies in clinical area of practice. Ethical issues in research. Research design. Sampling. Methods of data collection. Validity and reliability of data collection instruments. Data analysis (descriptive and inferential statistics/statistical packages for data analysis). Presentation and interpretation of findings. Discussion of findings and referencing. Plagiarism and implications. Utilisation of research results in practice. The application and use of the research process in identifying and solving nursing problems in education and practice. Writing of research proposals and conduct a simple research study in area of interest.



NSC 411: Management of Nursing Services

(2 Units C: LH 30)

Learning Outcomes

At the end of the course, the student should be able to:

1. explain the concepts of management, communication, supervision;
2. discuss the tools of management;
3. describe the elements of management;
4. discuss delegation, allocation and supervision of personnel; and
5. utilise fundamentals of monitoring and evaluation in the provision of care.

Course Contents

Definition of concepts. Evolution of management. The scope and nature of management. The various schools of management. Essential tools for effective management of resources (human, material, financial). Management theories. Decision making. Organisational structure and organogram. Communication. Interpersonal relationship and leadership styles. Motivation. Group dynamics. Delegation, supervision, accountability, budgeting and forecasting. Conflict and conflict resolution. Philosophy. Theory, principles and techniques of management generally and as related to management of nursing services. Documentation. Record keeping and performance evaluation. The nursing process as a tool for scientific approach to solving management problems and management by objectives (MBO).

NSC 402: Maternal and Child Health Nursing II

(2 Units C: LH 30)

Learning Outcomes

At the end of this course, the student should be able to:

1. discuss community cultural practices that affect maternal and child health;
2. describe counselling and communication strategies of relevance in maternal and child health services;
3. demonstrate the knowledge of pre, intra and postnatal care focusing on the mother and the baby;
4. demonstrate the knowledge of care of the newborn;
5. discuss strategies and measures to reduce maternal and child mortality in the community;
6. participate in domiciliary practice and family care as necessary;
7. participate in maternal and child health service programmes immunisation, growth monitoring, oral rehydration therapy as necessary; and
8. explain the process and use of data collection and management information system in family planning services.

Course Contents

Concept of community cultural practices. Maternal and child health nursing practice in community settings. Review of the reproductive system in relation to the practice of normal midwifery. The health of the family and the normal needs of the mother, father, foetus and other siblings in the family context. Management of normal pregnancy, labour, puerperium and the care of the baby. Prenatal care/ focused antenatal care. Normal labour. Stages of labour. Normal puerperium. The care of the newborn and newborn environment. Infant nutrition. Discharge, and follow-up. Family care studies as necessary. Domiciliary Midwifery Practice. Role of the nurse. Immunisations - Expanded Programme on Immunisation (EPI)/ National Programme on Immunisation (NPI). Oral Rehydration Therapy (ORT). Physical assessment. Nursing diagnosis. The use of Standing Order



and implementation of nursing interventions. Family planning and post-natal exercises. Growth and development of the child. Health education. Growth monitoring. Family planning and infertility. Data collection and management information system in family planning. Record keeping in community practice.

NSC 404: Maternal and Child Health Nursing Practicum 1

(2 Units C: PH 90)

Learning Outcomes

At the end of this clinical posting, the student should be able to:

1. explain the concept of care of the new born including immunisation;
2. demonstrate skills for conduct of maternal and child health services including antenatal booking and service;
3. conduct health education on immunization and proper nutrition;
4. participate in patient mobilisation and community participation activities; and
5. recognise the role of the family in maternal and child care services.

Course Contents

Students are posted to clinical and community sites where maternal and child health services are provided. Students' activities include, provision of normal midwifery services. Antenatal booking and mothers' comprehensive assessment. Palpation. Weighing. Urine testing. Mothers' education. Home visits in domiciliary midwifery (Field work – 6 weeks/ Health care institutions' practice and community midwifery services.

NSC 406: Mental Health Nursing II

(2 Units C: LH 15; PH 45)

Learning Outcomes

At the end of this course, the student should be able to:

1. identify socio cultural issues relating to mental health (such as peer/societal pressure and many others);
2. discuss concept of community mental health, preventive mental health/psychiatric services in schools, work places and communities;
3. explain social and psychological issues affecting mental health/illness;
4. discuss the role of traditional healers in mental health/psychiatric nursing;
5. utilise the nursing process in the care and management of mental health patients in all settings; and
6. organise and implement preventive mental health activities in the community.

Course Contents

Review of psychosocial development from childhood to adulthood. Human behaviour in illness. Social and cultural issues relating to mental health. The role of traditional healers in mental/psychiatric disease interpretation and management in the society (urban and rural). Application of the nursing process in the development of nursing care plans for clients with psychiatric/mental health issues. Rehabilitation. Parole, half way homes and many others for mental health disorders. Stigmatisation and discrimination in mental illness. Community psychiatry/community mental health. Use of systemic framework approach in the application of therapeutic interventions (considering the pragmatics and dynamics of human behaviours).



NSC 410: Community/Public Health Nursing III

(2 Units C: LH 30)

Learning Outcomes

At the end of this course, the student should be able to:

1. discuss the methods and process of conducting community needs assessment;
2. discuss strategies used in working with small groups at the community level and with agencies;
3. explain the programme and service development process for meeting health care needs of population groups;
4. discuss the process for programme and service implementation and evaluation with emphasis on critical public/community health issues and population groups such as
 - a. Home care populations
 - b. Family and community violence
 - c. School health population
 - d. Other special population groups at the community such as the elderly, people with disabilities, children in correctional homes and others; and
5. apply the model of public/community health planning – community diagnosis, care plans, implementation of care and evaluation in care of health needs of the community.

Course Contents

Definition of concepts. Methods and processes of community needs assessment. Development, implementation and evaluation of public/community health nursing, including primary health care programmes. Planning, organisation, and administration of programmes to meet community health needs, building on knowledge, attitudes and skills. Working with small groups and specific groups in the community –

- school health population,
- the elderly,
- people with disabilities
- children/adolescents in correctional homes/ facilities and others
- strategies for control of family and community violence

Programme planning, implementation and evaluation in the community. Promoting health of home care populations. School health nursing and application of nursing process in the community.

500 Level

NSC 501: Community/Public Health Nursing Practicum III

(2 Units C: PH 90)

Learning Outcomes

At the end of this clinical posting, the student should be able to:

1. apply the model of community health planning – community diagnosis, care plans, implementation of care and evaluation in care of health needs of the community;
2. demonstrate skills in consultation and counselling of patients;
3. demonstrate skills in the management of childhood illnesses and common endemic diseases at the primary health care facilities;
4. participate in school health programmes and health promotion activities; and
5. conduct home visits for follow up and community participation purposes as appropriate.



Course Contents

The students engage in service delivery at the primary health care level as emerging health professionals to acquire skills in consultation and management of common childhood diseases and common endemic diseases affecting the family. Other activities include planning with community groups and undertake appropriate follow up include home visits. Public Health Nurses supervise students for diagnoses and management of common childhood illnesses. Common endemic diseases in family context. Prescription of drugs and use of standing orders in the management of such illnesses. Students participate in school health programmes, surveillance and control of communicable diseases.

NSC 503: Maternal and Child Health Nursing Practicum II

(2 Units C: PH 90)

Learning Outcomes

At the end of this posting, the student should be able to:

1. participate in the community care of mothers at the maternal and child health facilities;
2. provide preventive and assistive care to mothers and their children aged 5 years and under;
3. engage in community mobilisation activities through health visits and health education for prevention of sexually transmitted infections and other diseases; and
4. provide counselling services to adolescent and couples in need of family planning services.

Course Contents

The students are posted to the community health facilities to work under supervision of trained staff for the conduct and provision of community midwifery services. Activities include participation in all the clinic services. Provision of antenatal care. Routine care. Monitoring of mothers in labour. Health education. Counselling. Home visits and follow ups. Child welfare clinics. Immunisations and practice proper recording and reporting.

NSC 505: Maternal and Child Health Nursing III

(2 Units C: LH 15; PH 45)

Learning Outcomes

At the end of this course, the student should be able to:

1. discuss the signs of obstetric emergencies;
2. explain the roles of nurses and midwife in the provision of care in obstetrics emergencies;
3. discuss abnormal labour and related midwifery care of clients in such conditions;
4. explain rationale, components and characteristics of youth friendly facilities; and
5. discuss risks and problems associated with adolescent health.

Course Contents

Complications associated with pregnancy, labour, postpartum and the neonatal life. Roles and responsibilities of nurses and midwives in prevention and management of obstetrics emergencies (antepartum haemorrhage, obstructed labour, postpartum haemorrhage, eclampsia and many others). Socio-cultural events that contribute significantly to causes of pregnancy complications and obstetrical emergencies. Risk factors/ conditions that complicate pregnancy and labour. Management of risk factors/ conditions. Management of medical conditions and infections that complicate pregnancy. Malposition and malpresentations and their management. Abnormal pregnancy. Abnormal labour. Obstetrics emergencies. Abnormal conditions of the new born. Youth friendly services. Teenage pregnancy and complications.



NSC 509: Health and Nursing Informatics II

(2 Units C: LH 30)

Learning Outcomes

At the end of this course, the student should be able to:

1. discuss the importance of computers in healthcare practice;
2. discuss the use of electronic health records;
3. explain the ethical boundaries in the sharing patient information electronically; and
4. apply health and nursing informatics in care of patients.

Course Contents

The concepts of health and nursing informatics. Use of informatics in nursing practice. Competencies in efficient use of information technology in health care. Electronic health records and clinical informatics. Protection of patient/provider privacy. Confidentiality and security of information in health care environments. Telehealth, telenursing and telemedicine. Nursing informatics practice applications. Social networking tools in communicating health-related information. Informatics and evidence based practice. Nursing informatics administrative applications and quality assurance.

NSC 511: Nursing Seminars

(2 Units C:LH 30)

Learning Outcomes

At the end of this course, the student should be able to:

1. develop seminar topics on contemporary/ contextual issues in nursing and nursing care; and
2. make presentations of the seminar before the faculty.

Course Contents

The course is designed to enable the student identify issues and trends in nursing and health care. In-depth knowledge is derived through literature review and interaction with members of the health team. Seminar report will be presented by the student.

NSC 513: Health Economics

(2 Units C: LH 30)

Learning Outcomes

At the end of the course the student should be able to:

1. demonstrate an understanding of the concept of health economics and healthcare financing;
2. explain how demand and supply is applied in healthcare;
3. discuss healthcare financing in Nigeria, the National Health Insurance Scheme (NHIS), cost containment, healthcare cost, budgeting and many others; and
4. discuss the role of the nurse in healthcare financing and NHIS.



Course Contents

Macro and micro economic factors that influence health, illness and health care delivery system. Concept of health economics. Factors that affect demand and supply of health care services. Macroeconomic indices that influence the economy and health. The costing of health and nursing services. Availability and distribution. Cost recovery of services. Healthcare financing and the National Health Insurance Scheme (NHIS). Role of nurses in the National Health Insurance Scheme.

NSC 502: Maternal and Child Health Nursing Practicum III

(2 Units C: PH 90)

Learning Outcomes

At the end of this clinical posting, the student should be able to:

1. demonstrate skills in assessing pregnant mothers for routine antenatal care;
2. conduct health education of mothers and clients on family planning methods and use;
3. conduct relevant number of antenatal palpations, vaginal examinations and normal deliveries as relevant to their level; and
4. participate in the care and management of mothers during the puerperal period.

Course Contents

Student activities in the clinical experience - discovering, developing and refining necessary competencies and skills related to maternal and child health care. Completion of 8hrs per week and a period of 6 weeks in the clinical settings where maternal and child health services are being rendered. Conduct of normal midwifery. Rotation through family planning clinic, antenatal clinic, labour ward, and postnatal wards in primary and tertiary institutions.

Each student to conduct 20 - 30 antenatal palpations, 10 vaginal examinations, 10 - 25 normal Midwifery deliveries, care for 5 - 30 women during normal puerperium, and perform minimum of five Episiotomies. In the family planning Unit, each student must insert 5 -10 IUCD and give oral contraceptives to at least 10 women. The course lecturer and the clinical instructors conduct on the site supervision of the students.

NSC 508: Entrepreneurship in Nursing

(1 Unit C: LH 15)

Learning Outcomes

At the end of this course, the student should be able to:

1. discuss the concept of entrepreneurship and entrepreneurship in nursing;
2. discuss opportunities and possibilities of self-employment/financing enterprise in nursing;
3. discuss challenges of entrepreneurship practice in nursing (using case studies);
4. explain legal aspects of entrepreneurship and implications to nursing practice; and
5. discuss positive attitudes to engagement in the entrepreneurial process and nursing entrepreneurship.

Course Contents

Concepts, principles and practice of nursing entrepreneurship. Entrepreneurial process. Exploring business opportunities. Developing a business plan. Exploring market strategies. Evolving organisational plan and developing financial plans. Issues in funding, launching out and working for business growth. Generation of business ideas in nursing and self employment. Challenges of entrepreneurship practice in nursing. Management of human, material and financial resources. Legal issues in business/private practice.



Course contents

The student will demonstrate the extent of application of knowledge and skills acquired in other courses especially research methodology in the execution of an individual research project. Individual student research report writing and presentation of the final research project report in an oral defence both internally before the faculty and final defence before the external examiners.

Sample course contents for some nursing specialties**Renal Nursing****Course Contents**

Acquisition of basic and advanced knowledge and technical skills required for providing standard and quality Nephrology Nursing care to clients in diverse settings. Development of sense of responsibility for directions. Critical thinking and accountability for clinical decisions taken. Self-direction and personal development. Technical skills needed for conducting renal replacement therapy and other therapeutic measures with maximal dexterity.

Operating Theatre Nursing**Course Contents**

Lectures and clinical practice that emphasise various forms of theatre design. Preparation of surgical patients and theatre for various specialties surgeries. Application of principles and techniques of asepsis and infection control to ensure quality nursing care for patients throughout the perioperative phases. Planning, arrangement and storage of surgical consumable, surgical instruments. Electrocautery equipment to comply with the needs of patients and members of a surgical team. Ensuring suitable and safety - conscious steps to prevent injury and enhance the level of patient safety in the operating theatre.

Occupational Health Nursing**Course Contents**

Introduction to identification and control of risks arising from physical, chemical, and other workplace hazards. Hazards that include chemical agents and solvents, heavy metals such as lead and mercury. Physical agents such as loud noise or vibration, and physical hazards such as electricity or dangerous machinery. All aspects of health and safety in the workplace with focus on primary and secondary prevention strategies. The roles of Occupational health nurse in industries organisations and other settings.

Geriatric Nursing**Course Contents**

Study and care of the elderly. The physical and psychosocial needs of the elderly. The care environment of the elderly. Elder abuse prevention and care. Burden of care among informal care givers. Diseases of aging. Nursing care of elderly with chronic and acute illnesses. Geriatric homes and home care of the elderly.



Minimum Academic Standards

Equipment

Teaching aids/audio visuals

Printed such as flow charts. Sketches. Drawings. Anatomical charts and books.

Non projected such as white board. Flip charts and transparencies.

Still projected such as Photographs. LCD projectors and accessories.

Audios: Radio. Recorded messages without video/text. Audio linked with visuals.

Film and video such as Open and closed circuit television

Camera. Public Address System.

Computer – based: Computers/Internet/ e learning materials.

'Realia' such as Models and dummies - anatomical models. Manikins. Model simulators. Bones. Complete human skeleton. Boxes of bones.

Beds and accessories

Adult beds and mattresses. Baby Cot. Pillows. Unisex Adult Dummy. Dolls. Bedside Lockers.

Bed Tables. Sandbags. Back Rest. Bed Blocks. Air Rings. Oxygen cylinder and Accessories with Carriers. Suction machines. Hot water bottle. Linen bins. Pedal Bins. Bed screens. Bed pans with cover. Urinals.

Aluminum wares – bowls, drums, kidney dishes and others

Small Sterilizing Drums. Large Sterilizing Drums. Stainless Steel Sputum Mugs. Sharps Disposable Container. Small Boiler Sterilizer. Large Boiler sterilizer.

Trolleys: Medicine Trolley. Dressing Trolley. Long Multipurpose Trolley. Small Trolley.

Trays: Stainless steel with cover. Stainless steel without cover.

Bowls: Stainless steel with cover. Small steel without cover. Medium with cover
Medium without cover. Large with cover

Plastic Bowls - Various Sizes

Kidney Dishes: Small with cover. Small without cover. Medium with cover

Medium without cover. Large with cover. Large without cover.

Gallipots: Stainless steel. Small with cover. Small without cover. Medium with cover.

Medium without cover. Large with cover. Large without cover.

Instruments (forceps) and others

Toothed Dissecting Forceps. Non toothed dissecting forceps.

Forceps. Plain Dissecting Forceps. Mosquito Artery Forceps. Large Artery Forceps.

Spencer Walls Artery Forceps. Dressing Forceps. Sponge Holding Forceps.

Cheatele forceps. Bowl Lifting Forceps. Vulsellum Forceps. Needle Holding Forceps.

Clip Removing Forceps. Tongue Holding Forceps. Mouth Gag. Stainless steel spatula.

Tracheotomy set. Tracheotomy Tubes. Metallic Airway. Rubber Airway. Stitch Scissors

Double sharp Scissors. .Double blunt Scissors. Sharp blunt Scissors. Different types of Vaginal Speculum (Sim's, Auvard's, Cuscus and many others). Drinking Mugs. Bard Parker Handles.

Plastic Jugs with cover. Glass Measuring Jar. Plastic measuring Jar. Graduated Stainless Steel measuring jar. Urinometers. Test Tubes. Test Tube Rack. Test Tube Holders. Pipettes. Bunsen burner.

Thermometers: Clinical Thermometers. Rectal Thermometers. Bath Thermometers.



Sphygmomanometers. Stethoscopes. Diagnostic Sets. Endoscope Sets.

Adult weighing scale. Baby weighing scale. Height Ruler

Catheters and tubes: Foleys catheters. Malecot Catheters. Depezzzer Catheters. Nasal Catheters Ryle's Tubes. Flatus Tubes. Rectal tubes. Enema tubes. Tourniquet. Bladder Syringe.

Ear Syringe

Trotters (various sizes). Cannula (various sizes). Airways (various sizes). Ceramic Mortar and piston. Wash Hand basin with stand. Angle poise lamp. Undine lamp. Patellar Hammer.

Turning Fork. Spirit Lamp

Furniture

Nurses' Table. Stackable chairs. Medicine Cupboard. Dangerous Drugs of Addiction (DDA) Cupboard. Lotion Cupboard. Instrument Cupboard. Equipment Cupboard. Bed Screens. Wall Clock.

Linen

Long bedsheets. Cot Sheet. Draw Sheet. Counterpanes. Blankets. Pillow Cover. Long Mackintosh. Draw mackintosh. Treatment mackintosh

Plastic Aprons. Patients' Gowns (Male,-Female). Pyjamas. Theatre Gowns. Theatre Caps.

Face flannels. Bath Towels. Hand Towels. Medicine Towels. Large Bath Sheet.

Consumables

Wooden Spatula. Surgical Blades (Different sizes). Spigots (Different sizes). Plain bandages. Crepe bandages.

Abdominal Bandages. Triangular bandages. Gauze. Cotton Wool. Plaster. Stockinet. Plaster of Paris. Injection Syringes and Needles (all sizes). Scalp Vein Needles. Disinfectants such as Izal, Dettol, Methylated Spirit. Savlon.

Disposable Gloves. Disposable Aprons. Surgical Gloves Finger Staff (Different sizes).

Face Masks. Oxygen Masks. Infusion Sets. Transfusion Sets.

Mouth wash fluid such as Glycothymol; other lotions - Sodium Bicarbonate Eusol. Hydrogen Peroxide.

Magnesium Sulphate. Gentian violet. Benedict's solution. Acetic Acid; Salicylsulphuric Acid. Ammonium Nitrate. Silver Nitrate. Litmus paper – Red & Blue. Clinitest tablets. Acetest tablets. Clinistix strips. Albustix strips. Urine bags. Colostomy bags.

Treatment sheets /records

Medication sheets. Post Operative Observation charts. Fluid intake and Output /Fluid charts. Vital signs chart. Nursing Care plan sheet. Consent forms. Diabetic charts. Neurological Observation charts. Laboratory forms. X-ray forms and many others.

Others: Kitchen utensils; food stuff and drugs

Specific for midwifery

Foetal stethoscope

Paediatric Sphygmomanometer with stethoscope

Stethoscope

Examination Table with stirrups

Delivery Couch

Delivery Bag



Auvard Vaginal Speculum
Cord Clamp
Sims vaginal Speculum
Cuscus vaginal Speculum
Genital Speculum
Urine sound
Bladder Sound
Incubator
Vacuum Extractor
Measuring Tape
Ruler
Oral Rehydration Therapy Set
Episiotomy Scissors
MVA Instruments (Syringes and different containers)
Utility Gloves
Ipas Instrument processing poster
Tenaculum
Needle Extender
Cervical Dilators
MVA procedure Video
Protocol/Guidelines for MVA procedure
Midwifery Kit

Toileteries

Disposable Aprons. Plastic Baby Bath Set. Plastic buckets. Baby Powder. Vaseline petroleum jelly. Towels. Baby Napkins. Safety pins. Rubber pants. Disposable baby Napkins. Sample Bra with broad straps. Patient Gowns. Baby Gowns.

Charts

Anatomical charts (Male and Female)
Family Planning Chart
Drug charts
Partograph
Procedure charts
Gestational age calendar
Country based client records/forms

Models

Pelvis floor (Landmark identified). Pelvic floor Muscles. The skull, Foetal skull (Landmark identified). Internal structure. External structure. Doll and Pelvis. Model for pelvic examination. Model for Uterine Evacuation. Vulva. Placenta.
Foetal Circulation. Organs of Reproduction. Embryology and Foetal Development
Mechanism of delivery. I U C D Insertion materials. Zoe or Mama Natalie. Breast (Breast feeding)
Child Birth Simulator. Cervical dilation model (plastic). Cervical replica (for IUD insertion)
Condom. Foetal Baby. Umbilical cord and placenta for Vacuum Delivery

Drugs



Samples of Analgesics
Samples of Antibiotics
Samples of Narcotic Analgesics
Samples of Light Sedatives
Samples of General Anaesthesia / Local
Broad spectrum Antibiotics
Tetanus Toxoid
Haematinics
Anti hypertensives and anti convulsants (such as diazepam and magnesium sulphate)
Infant Eye medications (such as silver nitrate)
Infant Medications (such as Vaccines, Vitamin K)
Antimalarials
Uterotonics (such as Oxytocin, Ergometrine, Misoprostol)

****** All equipment are stocked as necessary for use and reserve**

Transportation

Departmental car for Head of department
Minimum of 4 Buses (18 -22 Seaters) for student clinical experiences shuttles to hospitals, communities and other facilities and one (1) for Staff supervision

Staffing

The details of the general resource requirements are spelt out in the programme specification

Academic and Non-academic Staff

Lecturers in B.N.Sc. programme will be drawn from the various disciplines required for the B.N.Sc. curriculum. Where the relevant courses already exist in other Departments in the particular University, the Nursing students will receive lectures with their counterparts in those Departments. Lecturers in the Department of Nursing, in addition to possessing Postgraduate degrees in Nursing, must possess academic qualification in a nursing specialty area and satisfy the minimum requirements for teaching in the University. The academic staff/student ratio should be 1:15 for the programme.

Academic support staff should include Clinical Instructors, Laboratory Technicians and administrative staff. A Clinical Instructor should be a Nurse graduate and also registered Nurse/Midwife/Public Health Nurse with a minimum of two years clinical experience. Possession of the Fellowship of the West African Postgraduate College of Nursing and Midwifery (FWAPCNM) should be an added advantage. There shall be one clinical instructor for each of the four major nursing sub - specialties of nursing, midwifery, public/community health nursing and mental health.



Library

The Department should have a physical library (well ventilated, air conditioned and adequately furnished with standard library furnishings) with up to date textbooks in relevant Life, Social sciences, Nursing journals and Nursing books in the core areas of Nursing (such as Medical-Surgical, Maternal and Child Health Nursing and Midwifery, Public/Community Health Nursing, Mental Health Nursing, and Nursing Research, Nursing Education).

There should be a learning resource room/centre with prescribed number of computers and accessories, phantoms and audio visual aids and e – learning facilities. This should also include resources for electronic access to online and offline literature in the aforementioned areas.

Classrooms, Laboratories, Clinics and Offices

Academic and Non-academic spaces

The nursing degree programme should be located in a Department of Nursing Science/Faculty of Nursing in the University. Provisions should be made for seminar rooms, tutorial rooms and laboratories for nursing, midwifery and community/public health demonstrations.

Equipment for demonstrating nursing, midwifery and community/public health nursing procedures should be available in the respective laboratories.

Classrooms must be spacious, well ventilated and equipped with modern comfortable student seats, and adequate Multimedia teaching devices.

Classroom

The standard requirement of 0.65m² per full-time student should be maintained. Thus the minimum total space requirement for a faculty or department shall be the product of its total full time equivalent student enrolment (FTE) and the minimum space requirement per full-time equivalent i.e. (FTE) 0.65m².

Office

In this respect, each academic staff should have an office space of at least 25 square metres taking into cognisance the status/cadre of the staff

In addition, there should be for the Faculty, a Dean's office and for each Department a Head of Department's office with attached offices for their supporting staff as specified below in m²:

| | | |
|----------------------------------|---|-------|
| Professor's office | - | 18.50 |
| Head of Department's office | - | 18.50 |
| Tutorial teaching staff's office | - | 13.50 |
| Other teaching staff space | - | 7.00 |
| Technical staff space | - | 7.00 |
| Secretarial space | - | 7.00 |
| Staff research laboratory | - | 16.50 |
| Seminar Space/per student | - | 1.85 |
| Laboratory space (per student) | - | 7.50 |

Academic and Administrative Equipment

There should be Head of Department office adequately furnished with Secretariat office attached. Each department (Nursing, Midwifery, Mental Health and Community/Public Health Nursing) shall have their Administrative offices.

Each lecturer should have an office space, well ventilated and adequately furnished.

The clinical Instructors should have adequately furnished office space in both the University and the Hospital.



Each office/room should be air conditioned, adequately furnished and provided with PC/laptops and Audio Visual materials.

In addition, Audio-visual materials and computer/information technology facilities should be available in the Department of Nursing.

Equipment and other facilities in the clinical areas should conform to the prescribed standards.

**** Steady electricity supply and/or functional standby alternative electricity supply (Generators and/or Solar powered).**



B. Sc. Human Nutrition and Dietetics

Overview

Nutrition and Dietetics programme is designed to equip students with the requisite knowledge and skills to utilise food and science of nutrition in the prevention and treatment of diseases, and to respond to the diverse needs of patients, families and patients, within a variety of settings using evidence-based approaches and ethics. In addition, it will enable students to assess nutritional status, understand how food intake and dietary requirements can be altered by illness to translate nutritional science and information about food, into practical dietary advice.

Philosophy

Human Nutrition is the science of food, nutrients and other substances therein; their action, interaction and balance in relationship contribute to health and disease. The process by which the human ingests, digests, absorbs, transports and utilizes nutrients and disposes of the end products also contributes to the health status of a person, Dietetics, the application of scientific principles of nutrition informs professional interventions, in the management of health and disease conditions. The degree programme in Human Nutrition and Dietetics is designed to produce graduates who would apply the knowledge and principles of the, multifaceted scientific domain of human nutrition in tackling the current and future food, nutrition and health challenges of society in order to enhance sustainable development.

Objectives

The objectives are to train graduates who are able to:

1. assess the nutritional problems of population groups, identify the causes and design interventions for their solution;
2. plan, implement, monitor and evaluate nutrition programmes;
3. exhibit the necessary understanding of the scientific basis of health and disease;
4. provide the skilled manpower in the area of Nutrition and Dietetics to take up management and leadership positions in the public and private sectors;
5. create small to medium scale businesses in the areas of the Nutrition and Dietetics;
6. promote scholarship and high quality research aimed at solving contemporary nutrition problems as well as expand the frontiers of knowledge in Human Nutrition and Dietetics; and
7. contribute to global discourse on Nutrition and Dietetics and international perspectives of nutrition challenges.

Unique Features of the Programme

1. The study of human nutrition is interdisciplinary in character, involving not only biological sciences but also social science fields like psychology, which explore the influence of attitudes, beliefs, preferences, and cultural traditions on food choices.
2. The B.Sc. Nutrition and Dietetics programme offers opportunity to apply nutrition science to practice as either dietician in clinical setting or as public health nutritionists for the prevention and treatment of diseases.
3. The B.Sc. Nutrition and Dietetics programme sits well in providing the necessary knowledge and skills that will contribute in the achievement of sustainable development goals and beyond.



Employability Skills

Graduates should be able to function effectively as Nutritionists and or Dietitians in both public and private sectors. Moreover, they should be able to plan, implement and manage multisectoral nutrition programmes. Graduates of this programme are expected to:

1. have competence in conceptual, management and entrepreneurial skills;
2. acquire practical and analytical competence to enable them manage sustainable Nutrition programmes;
3. be equipped with data processing skills and have ability to interpret data to provide solutions to Nutrition problems;
4. be able to function in advisory capacity to government and private agencies in areas related to Nutrition;
5. be able to plan, implement, monitor and evaluate appropriate nutrition intervention programmes for benefits of population groups.
6. be able to acquire leadership qualities that will enable them take on leadership roles in public and private establishments related to Nutrition.
7. have competence in communication skills and be able to clearly counsel and present research/field reports with convincing arguments either in writing or orally;
8. be equipped with information technology skills required for global communication;
9. have skills in participatory approach to conservation and utilization of renewable natural resources with a view to enhancing rural development;
10. be able to execute development programmes in both government and private sectors and create self-employment;
11. apply nutrition care process based on the expectations and priorities of individuals, groups, community or population;
12. adopt evidence-based approach to Nutrition and Dietetics practice; and
13. acquire advocacy skills.

Behavioural Attributes

1. The graduate of the programme should appreciate the dignity in labour through competence in conception, planning, execution, monitoring and evaluation of various nutrition programmes and enterprises
2. The graduate should be able to adapt to the socio-economic and cultural situations of urban and rural settings and integrate with dwellers in these communities
3. The graduate should also maintain ethical standards of the profession

21st Century Skills

A graduate of B.Sc. Nutrition and Dietetics is expected to acquire skills that will allow for competence in the 21st Century. These include:

1. collaboration and team work;
2. creativity and imagination;
3. critical thinking;
4. problem solving;
5. flexibility and adaptability;
6. information Literacy;
7. leadership;
8. civic literacy and citizenship;
9. social responsibility;
10. technology literacy;



11. initiative.

Admission and Graduation Requirements

The modes of entry are Unified Tertiary Matriculation Examination and direct entry. To be admitted into the B.Sc. Human Nutrition and Dietetics programme the candidate must meet the stipulated entry requirements.

Admission Requirements

The minimum requirements for admission to the programme include the following:

Five-Year Degree Programme: Through the Unified Tertiary Matriculation Examination (UTME) into 100 level of the programme. Candidates must satisfy the university minimum requirements of five credits passes at SSC (or its equivalent), which must include Mathematic, Physics, Biology, Chemistry and English Language.

Direct Entry: Candidates must satisfy the university minimum requirements of five credits passes at SSC (or its equivalent) two of which must be at the advanced level or its equivalent qualification in the following subjects: Biology, Physics, and one other Science subject into 200 level of the programme.

To graduate, a student must have undergone four or five years of study depending on his/her entry point, including 6 months industrial training. Course workload must meet the graduation requirements of the University.

Global Course Structure

100 Level

| Course Code | Course Title | Unit(s) | Status | LH | PH |
|--------------|---|-----------|--------|----|----|
| GST 111 | Communication in English | 2 | C | 15 | 45 |
| GST 112 | Nigerian Peoples and Culture | 2 | C | 30 | - |
| BIO 101 | General Biology I | 2 | C | 30 | - |
| BIO 102 | General Biology II | 2 | C | 30 | - |
| BIO 107 | General Biology Practical I | 1 | C | - | 45 |
| BIO 108 | General Biology Practical II | 1 | C | - | 45 |
| CHM 101 | General Chemistry I | 2 | C | 30 | - |
| CHM 102 | General Chemistry II | 2 | C | 30 | - |
| CHM 107 | General Chemistry Practical I | 1 | C | - | 45 |
| CHM 108 | General Chemistry Practical II | 1 | C | - | 45 |
| COS 101 | Introduction to Computer Science | 3 | C | 30 | 45 |
| MTH 101 | Elementary Mathematics I | 2 | C | 30 | - |
| PHY 101 | General Physics I | 2 | C | 30 | - |
| PHY 102 | General Physics II | 2 | C | 30 | - |
| PHY 107 | General Physics Practical | 1 | C | | 45 |
| PHY 108 | General Physics Practical II | 1 | C | - | 45 |
| NUT 101 | Introduction to Human Nutrition and Dietetics | 2 | C | 30 | - |
| Total | | 29 | | | |



200 Level

| Course Code | Course Title | Unit(s) | Status | LH | PH |
|--------------------|---------------------------------------|----------------|---------------|-----------|-----------|
| GST 212 | Philosophy, Logic and Human Existence | 2 | C | 30 | - |
| ENT 211 | Entrepreneurship and Innovation | 2 | C | 30 | - |
| ANA 203 | General and Systemic Embryology | 2 | C | 30 | - |
| BCH 201 | General Biochemistry I | 2 | C | 30 | - |
| BCH 203 | General Biochemistry Practical | 1 | C | - | 45 |
| MCB 201 | Introduction to Microbiology | 3 | C | 45 | - |
| NUT 201 | Principles of Nutrition and Dietetics | 2 | C | 30 | - |
| NUT 202 | Introduction to Clinical Nutrition | 2 | C | 30 | - |
| PIO 201 | Introductory Physiology and Blood | 2 | C | 30 | - |
| BIO 208 | Biostatistics | 2 | C | 30 | - |
| Total | | 20 | | | |

300 Level

| Course Code | Course Title | Unit(s) | Status | LH | PH |
|--------------------|---|----------------|---------------|-----------|-----------|
| ENT 312 | Venture Creation | 2 | C | 15 | 45 |
| GST 312 | Peace and Conflict Resolution | 2 | C | 30 | - |
| NUT 301 | Food Composition, Analysis and Sensory Evaluation | 2 | C | 15 | 45 |
| NUT 302 | Diet Therapy & Hospital Practice I | 3 | C | 15 | 90 |
| NUT 303 | Nutritional Assessment and Food Consumption Studies | 2 | C | 30 | - |
| NUT 304 | Research Methods in Nutrition and Dietetics | 2 | C | 30 | - |
| NUT 305 | Nutrition Education and Communication | 2 | C | 30 | - |
| NUT 399 | Students' Industrial Work Experience (SIWES) I | 6 | C | - | 270 |
| Total | | 21 | | | |

400 Level

| Course Code | Course Title | Unit(s) | Status | LH | PH |
|--------------------|---|----------------|---------------|-----------|-----------|
| NUT 401 | Advanced Food Preparation | 2 | C | 30 | - |
| NUT 402 | Community Nutrition | 3 | C | 45 | - |
| NUT 403 | International Nutrition | 2 | C | 30 | - |
| NUT 404 | Nutrition Planning, Policy and Advocacy | 2 | C | 30 | - |
| NUT 405 | Public Health Nutrition | 2 | C | 30 | - |



| | | | | | |
|---------|---|-----------|---|----|-----|
| NUT 406 | Seminar in Human Nutrition and Dietetics & Proposal Writing | 2 | C | 30 | - |
| NUT 407 | Nutrition Counselling | 2 | C | 30 | - |
| NUT 499 | Students' Industrial Work Experience II (SIWES II) | 6 | C | - | 270 |
| | Total | 21 | | | |

500 Level

| Course Code | Course Title | Unit(s) | Status | LH | PH |
|-------------|--------------------------------|-----------|--------|----|-----|
| NUT 501 | Advances in Human Nutrition | 2 | C | 30 | - |
| NUT 502 | Diet Therapy Practical | 2 | C | - | 90 |
| NUT 503 | Nutritional Epidemiology | 2 | C | 30 | - |
| NUT 504 | Food Chemistry and Toxicology | 2 | C | 30 | - |
| NUT 505 | Sports Nutrition | 2 | C | 30 | - |
| NUT 506 | Consumer Education | 2 | C | 30 | - |
| NUT 507 | Recipe Development and Testing | 3 | C | 15 | 90 |
| NUT 599 | Research Project | 4 | C | - | 180 |
| | Total | 19 | | | |

Course Contents and Learning Outcomes

100 Level

GST 111: Communication in English

(2 Units C: LH 15; PH 45)

Learning Outcomes

At the end of this course, students should be able to

1. identify possible Sound patterns in English Language;
2. list notable Language skills;
3. classify word formation processes;
4. construct simple and fairly complex sentences in the English Language;
5. apply logical and critical reasoning skills for meaningful presentations;
6. demonstrate an appreciable level of the art of public speaking and listening; and
7. write simple and technical reports.

Course Contents

Introduction to Sound Patterns in English (Vowels and Consonants, Phonetics and Phonology). English Word Classes (Lexical and Grammatical Words; Definitions, forms, functions, Usages; Collocations). Sentence in English (Types: Structural and Functional, Simple and Complex). Grammar and Usage (Tense, mood, modality and concord, aspects of language use in everyday life). Logical and Critical Thinking and Reasoning Methods (Logic and Syllogism, Inductive and Deductive Argument and Reasoning Methods, Analogy, Generalisation and Explanations). Ethical considerations, Copyright Rules and Infringements. Writing Activities: (Pre-writing, Writing, Post writing, Editing and Proofreading; Brainstorming, outlining, Paragraphing, Types of writing, Summary, Essays, Letter, Curricular Vitae, Report writing, Note making and many others.



Mechanics of writing) Comprehension Strategies: (Reading and types of Reading, Comprehension Skills, 3RsQ). Proverbs, Idioms and other figures of Speech. The art of Public Speaking and listening. Information and Communication Technology in modern Language Learning.

GST 112: Nigerian People and Culture

(2 Units C: LH 30)

Learning Outcomes

At the end of this course, students should be able to:

1. analyse the historical foundation of the Nigerian culture and arts in pre-colonial times,
2. list and identify the major linguistic groups in Nigeria;
3. explain the gradual evolution of Nigeria as a political unit;
4. analyse the concepts of Trade, Economic and Self-reliance status of the Nigerian peoples towards national development;
5. enumerate the challenges of the Nigerian State towards Nation Building;
6. analyse the role of the Judiciary in upholding People's Fundamental Rights;
7. identify acceptable norms and values of the major ethnic groups in Nigeria; and
8. list and suggest possible solutions to identifiable Nigerian environmental, moral and value problems.

Course Contents

Nigerian history, culture and art up to 1800 (Yoruba, Hausa and Igbo peoples and culture; Peoples and Culture of the ethnic minority groups). Nigeria under Colonial rule (Advent of Colonial rule in Nigeria; Colonial administration of Nigeria). Evolution of Nigeria as a political unit (Amalgamation of Nigeria in 1914; Formation of political parties in Nigeria; Nationalist Movement and Struggle for Independence). Nigeria and challenges of Nation Building (Military intervention in Nigeria Politics; Nigeria Civil War; Corruption). Concept of Trade and Economics of Self-reliance (Indigenous Trade and Market System; Indigenous apprenticeship System among the Nigerian people; Trade, Skill acquisition and Self-reliance). Social Justices and National Development (Law Definition and Classification. Judiciary and Fundamental Rights). Individual, Norms and Values (Basic Nigeria Norms and Values, Patterns of citizenship acquisition, Citizenship and Civic responsibilities, Indigenous languages, Usage and Development, Negative attitudes and conducts, Cultism, kidnapping and other related social vices). Re-orientation, Moral and National Values (The 3R's – Reconstruction, Rehabilitation and Re-orientation; Re-orientation Strategies: Operation Feed the Nation (OFN), Green Revolution, Austerity Measures, War Against Indiscipline (WAI), War Against Indiscipline and Corruption (WAIC), Mass Mobilisation for Self-Reliance, Social Justice and Economic Recovery (MAMSER), National Orientation Agency (NOA).



BIO 101: General Biology I

(2 Units C: LH 30)

Learning Outcomes

At the end of this course, students should be able to:

1. explain cell's structure and organisations;
2. summarise functions of cellular organelle;
3. characterise living organisms and state their general reproduction;
4. describe the interrelationship that exists between organisms;
5. discuss the concept of heredity and evolution; and
6. enumerate habitat types and their characteristics.

Course Contents

Cell structure and organisation. functions of cellular organelles. characteristics and classification of living things. chromosomes, genes their relationships and importance. General reproduction. Interrelationships of organisms (competitions, parasitism, predation, symbiosis, commensalisms, mutualism, saprophytism). Heredity and evolution (introduction to Darwinism and Lamarckism, Mendelian laws, explanation of key genetic terms). Elements of ecology and types of habitat.

BIO 102: General Biology II

(2 Units C: LH 30)

Learning Outcomes

At the end of the lectures, students should be able to:

1. List the characteristics, methods of identification and classification of Viruses, bacteria and fungi;
2. state the unique characteristics of plant and animal kingdoms;
3. describe ecological adaptations in the plant and animal kingdoms;
4. explain nutrition, respiration, excretion and reproduction in plants and animals; and
5. describe growth and development in plants and animals.

Course Contents

Basic characteristics, identification and classification of viruses, bacteria and fungi. A generalised survey of the plant and animal kingdoms based mainly on the study of similarities and differences in the external features. Ecological adaptations. Briefs on physiology to include nutrition, respiration, circulatory systems, excretion, reproduction, growth and development.

BIO 107: General Biology Practical I

(1 Unit C: PH 45)

Learning Outcomes

At the end of the course, students should be able to:

1. outline common laboratory hazards;
2. provide precautions on laboratory hazards;
3. state the functions of the different parts of microscope;
4. use the microscope and describe its maintenance;
5. draw biological diagrams and illustrations; and
6. apply scaling and proportion to biological diagrams.



Course Contents

Common laboratory hazards: prevention and first aid. Measurements in biology. Uses and care of microscope. Compound and dissecting microscope. Biological drawings and illustration, scaling, accuracy and proportion; use of common laboratory apparatus and laboratory experiments designed to illustrate the topics covered in BIO 101.

BIO 108: General Biology Practical II

(1 Unit C: PH 45)

Learning Outcomes

At the end of the course, students should be able to:

1. describe the anatomy of flowering plants;
2. differentiate types of fruit and seeds;
3. state ways of handling and caring for biological wares;
4. describe the basic histology of animal tissues; and
5. identify various groups in the animal kingdom.

Course Contents

Anatomy of flowering plants, primary vegetative body: stem, leaf and root to show the mature tissues namely parenchyma, collenchyma, sclerenchyma, xylem and phloem. Types of fruits and seeds. Care and use of dissecting kits and other biological wares. Dissection and general histology of animal tissues based on vertebrate forms. Morphology and functions of epithelial, muscular, nervous and connective tissues. Examination of various groups of lower invertebrates under microscopes, identification of various groups of organisms in Animal Kingdom. And any experiment designed to emphasise the practical aspects of topics in BIO 102.

CHM 101: General Chemistry I

(2 Units C: LH 30)

Learning Outcomes

At the end of this course, the students should be able to:

1. define atom, molecules and chemical reactions;
2. discuss the Modern electronic theory of atoms;
3. write electronic configurations of elements on the periodic table;
4. rationalise the trends of atomic radii, ionization energies, electronegativity of the elements based on their position in the periodic table;
5. identify and balance oxidation – reduction equation and solve redox titration problems.
6. draw shapes of simple molecules and hybridized orbitals;
7. identify the characteristics of acids, bases and salts, and solve problems based on their quantitative relationship;
8. apply the principles of equilibrium to aqueous systems using Le Chatelier's principle to predict the effect of concentration, pressure and temperature changes on equilibrium mixtures;
9. analyse and perform calculations with the thermodynamic functions, enthalpy, entropy and free energy; and
10. determine rates of reactions and its dependence on concentration, time and temperature.

Course Contents

Atoms, molecules and chemical reactions. Modern electronic theory of atoms. Electronic configuration, periodicity and building up of the periodic table. Hybridization and shapes of simple molecules. Valence Forces. Structure of solids. Chemical equations and stoichiometry. Chemical



bonding and intermolecular forces. Kinetic theory of matter. Elementary thermochemistry. Rates of reaction. Equilibrium and thermodynamics. Acids, bases and salts. Properties of gases. Redox reactions and introduction to electrochemistry. Radioactivity.

CHM 102: General Chemistry II

(2 Units C: LH 30)

Learning Outcomes

At the end of this course, the students should be able to:

1. state the importance and development of organic chemistry;
2. define fullerenes and its applications;
3. discuss electronic theory;
4. determine the qualitative and quantitative of structures in organic chemistry;
5. describe rules guiding nomenclature and functional group classes of organic chemistry;
6. determine rate of reaction to predict mechanisms of reactions;
7. identify classes of organic functional group with brief description of their chemistry;
8. discuss comparative chemistry of group 1A, IIA and IVA elements; and
9. describe basic properties of Transition metals.

Course Contents

Historical survey of the development and importance of Organic Chemistry. Fullerenes as fourth allotrope of carbon, uses as nanotubules, nanostructures, nanochemistry. Electronic theory in organic chemistry. Isolation and purification of organic compounds. Determination of structures of organic compounds including qualitative and quantitative analysis in organic chemistry. Nomenclature and functional group classes of organic compounds. Introductory reaction mechanism and kinetics. Stereochemistry. The chemistry of alkanes, alkenes, alkynes, alcohols, ethers, amines, alkyl halides, nitriles, aldehydes, ketones, carboxylic acids and derivatives. The Chemistry of selected metals and non-metals. Comparative chemistry of group IA, IIA and IVA elements. Introduction to transition metal chemistry.

CHM 107: General Chemistry Practical I

(1 Unit C: PH 45)

Learning Outcomes

At the end of the course the students should be able to:

1. state the general laboratory rules and safety procedures;
2. collect scientific data and correctly carrying out Chemical experiments;
3. identify the basic glassware and equipment in the laboratory;
4. state the differences between primary and secondary standards;
5. perform redox titration;
6. recording observations and measurements in the laboratory notebooks; and
7. analyse the data to arrive at scientific conclusions.

Course Contents

Laboratory experiments designed to reflect topics presented in courses CHM 101 and CHM 102. These include acid-base titrations, qualitative analysis, redox reactions, gravimetric analysis, data analysis and presentation.



CHM 108: General Chemistry Practical II

(1 Unit C: PH 45)

Learning Outcomes

At the end of this course, the students should be able to:

1. identify the general laboratory rules and safety procedures;
2. collect scientific data and correctly carrying out Chemical experiments;
3. identify the basic glassware and equipment in the laboratory;
4. identify and carry out preliminary tests which includes ignition, boiling point, melting point, test on known and unknown organic compounds;
5. perform solubility tests on known and unknown organic compounds;
6. conduct elemental tests on known and unknown compounds; and
7. conduct functional group/confirmatory test on known and unknown compounds which could be acidic / basic / neutral organic compounds.

Course Contents

Continuation of CHM 107. Additional laboratory experiments to include functional group analysis, quantitative analysis using volumetric methods.

MTH 101: Elementary Mathematics I (Algebra and Trigonometry) (2 Units C: LH 30)

Learning Outcomes

At the end of this course students should be able to:

1. explain basic definition of Set, Subset, Union, Intersection, Complements and use of Venn diagrams;
2. solve quadratic equations;
3. Solve trigonometric functions;
4. identify various types of numbers; and
5. solve some problems using Binomial theorem.

Course Contents

Elementary set theory, subsets, union, intersection, complements, venn diagrams. Real numbers, integers, rational and irrational numbers. Mathematical induction, real sequences and series. Theory of quadratic equations. Binomial theorem. Complex numbers. Algebra of complex numbers. The Argand diagram. De-Moivre's theorem, nth roots of unity. Circular measure, trigonometric functions of angles of any magnitude, addition and factor formulae.

COS 101: Introduction to Computing Sciences

(3 Units C: LH 30; PH 45)

Learning Outcomes

At the end of the course, students should be able to:

1. explain basic components of computers and other computing devices;
2. describe the various applications of computers;
3. explain information processing and its roles in the society;
4. describe the Internet, its various applications and its impact;
5. explain the different areas of the computing discipline and its specialisations; and
6. demonstrate practical skills on using computers and the internet.



Course Contents

Brief history of computing. Description of the basic components of a computer/computing device. Input/Output devices and peripherals. Hardware, software and human ware. Diverse and growing computer/digital applications. Information processing and its roles in society. The Internet, its applications and its impact on the world today. The different areas/programs of the computing discipline. The job specialisations for computing professionals. The future of computing.

Lab Work: Practical demonstration of the basic parts of a computer. Illustration of different operating systems of different computing devices including desktops, laptops, tablets, smart boards and smart phones. Demonstration of commonly used applications such as word processors, spreadsheets, presentation software and graphics. Illustration of input and output devices including printers, scanners, projectors and smartboards. Practical demonstration of the Internet and its various applications. Illustration of browsers and search engines. How to access online resources.

PHY 101: General Physics I (Mechanics)

(2 Units C: LH 30)

Learning Outcomes

At the end of the course, student should be able to;

1. identify and deduce the physical quantities and their units;
2. differentiate between vectors and scalars;
3. describe and evaluate motion of systems on the basis of the fundamental laws of mechanics;
4. apply Newton's laws to describe and solve simple problems of motion;
5. evaluate work, energy, velocity, momentum, acceleration, and torque of moving or rotating objects;
6. explain and apply the principles of conservation of energy, linear and angular momentum;
7. describe the laws governing motion under gravity; and
8. explain motion under gravity and quantitatively determine behaviour of objects moving under gravity.

Course Contents

Space and time. Units and dimension, Vectors and Scalars. Differentiation of vectors: displacement, velocity and acceleration. Kinematics. Newton laws of motion (Inertial frames, Impulse, force and action at a distance, momentum conservation). Relative motion. Application of Newtonian mechanics. Equations of motion. Conservation principles in physics. Conservative forces. Conservation of linear momentum. Kinetic energy and work. Potential energy. System of particles. Centre of mass. Rotational motion: Torque, vector product, moment, rotation of coordinate axes and angular momentum. Polar coordinates. Conservation of angular momentum. Circular motion. Moments of inertia. gyroscopes and precession. Gravitation: Newton's Law of Gravitation. Kepler's Laws of Planetary Motion. Gravitational Potential Energy. Escape velocity. Satellites motion and orbits.



PHY 102: General Physics II (Electricity & Magnetism)**(2 Units C: LH 30)****Learning Outcomes**

At the end of this course, the student should be able to:

1. describe the electric field and potential, and related concepts, for stationary charges;
2. calculate electrostatic properties of simple charge distributions using Coulomb's law, Gauss's law and electric potential;
3. describe and determine the magnetic field for steady and moving charges;
4. determine the magnetic properties of simple current distributions using Biot-Savart and Ampere's law;
5. describe electromagnetic induction and related concepts, and make calculations using Faraday and Lenz's laws;
6. explain the basic physical of Maxwell's equations in integral form;
7. evaluate DC circuits to determine the electrical parameters; and
8. determine the characteristics of ac voltages and currents in resistors, capacitors, and Inductors.

Course Contents

Forces in nature. Electrostatics; electric charge and its properties, methods of charging. Coulomb's law and superposition. electric field and potential. Gauss's law. Capacitance. Electric dipoles. Energy in electric fields. Conductors and insulators, current, voltage and resistance. Ohm's law and analysis of DC circuits. Magnetic fields. Lorentz force. Biot-Savart and Ampère's laws. magnetic dipoles. Dielectrics. Energy in magnetic fields. Electromotive force. Electromagnetic induction. Self and mutual inductances. Faraday and Lenz's laws. Step up and step-down transformers: Maxwell's equations. Electromagnetic oscillations and waves. AC voltages and currents applied to inductors, capacitors, resistance, and combinations.

PHY 107: General Practical Physics I**(1 Unit C: PH 45)****Learning Outcomes**

At the end of the course, the student should be able to;

1. conduct measurements of some physical quantities;
2. make observations of events, collect and tabulate data;
3. identify and evaluate some common experimental errors;
4. plot and analyse graphs; and
5. draw conclusions from numerical and graphical analysis of data.

Course Contents

This introductory course emphasises quantitative measurements. The treatment of measurement errors, and graphical analysis. A variety of experimental techniques should be employed. The experiments include studies of meters, the oscilloscope, mechanical systems, electrical and mechanical resonant systems. Light. Heat. Viscosity and many others, covered in PHY 101 and PHY 102. However, emphasis should be placed on the basic physical techniques for observation, measurements, data collection, analysis and deduction.



PHY 108: General Practical Physics II**(1 Unit C: PH 45)****Learning Outcomes**

At the end of this course, the student should be able to:

1. conduct measurements of some physical quantities;
2. make observations of events, collect and tabulate data;
3. identify and evaluate some common experimental errors;
4. plot and analyse graphs;
5. draw conclusions from numerical and graphical analysis of data; and
6. prepare and present practical reports.

Course Contents

This practical course is a continuation of PHY 107 and is intended to be taught during the second semester of the 100 level to cover the practical aspect of the theoretical courses that have been covered with emphasis on quantitative measurements. The treatment of measurement errors, and graphical analysis. However, emphasis should be placed on the basic physical techniques for observation, measurements, data collection, analysis and deduction.

NUT 101: Introduction to Human Nutrition and Dietetics**(2 Units C: LH 30)****Learning Outcomes**

At the end of this course, students should be able to:

1. explain the objectives of Nutrition and Dietetics;
2. define key terms in Nutrition and Dietetics;
3. discuss basic principles of nutrition;
4. give basic overview on the relationship between nutrition and health; and
5. explain nutrient requirements and intakes

Course Contents

Definition and goals of studying Human Nutrition and Dietetics; Historical development, philosophy and objectives of Nutrition and dietetics; Career opportunities in Human Nutrition and Dietetics, including the necessary academic preparations and personal qualities required. Basic human needs and the role of Human Nutrition and Dietetics in meeting these needs; Nature of families and their nutritional needs; Definition of major concepts in Nutrition: Nutrients, their functions and sources; malnutrition; adequate diets; nutrient needs/requirements; Relationship between nutrition and health, including HIV/AIDS; Human Nutrition and Dietetics in National Development.

200 Level**GST 212: Philosophy, Logic and Human Existence****(2 Units C: LH 30)****Learning Outcomes**

A student who has successfully gone through this course should be able to:

1. know the basic features of philosophy as an academic discipline;
2. identify the main branches of philosophy & the centrality of logic in philosophical discourse;
3. know the elementary rules of reasoning;
4. distinguish between valid and invalid arguments;



5. think critically and assess arguments in texts, conversations and day-to-day discussions;
6. critically assess the rationality or otherwise of human conduct under different existential conditions;
7. develop the capacity to extrapolate and deploy expertise in logic to other areas of knowledge; and
8. guide his or her actions, using the knowledge and expertise acquired in philosophy and logic.

Course Contents

Scope of philosophy; notions, meanings, branches and problems of philosophy. Logic as an indispensable tool of philosophy. Elements of syllogism, symbolic logic— the first nine rules of inference. Informal fallacies, laws of thought, nature of arguments. Valid and invalid arguments, logic of form and logic of content — deduction, induction and inferences. Creative and critical thinking. Impact of philosophy on human existence. Philosophy and politics, philosophy and human conduct, philosophy and religion, philosophy and human values, philosophy and character molding and many others.

ENT 211: Entrepreneurship and Innovation

(2 Units C: LH 30)

Learning Outcomes

At the end of this course, students should be able to:

1. explain the concepts and theories of entrepreneurship, intrapreneurship, opportunity seeking, new value creation, and risk taking;
2. state the characteristics of an entrepreneur;
3. analyse the importance of micro and small businesses in wealth creation, employment, and financial independence
4. engage in entrepreneurial thinking;
5. identify key elements in innovation;
6. describe stages in enterprise formation, partnership and networking including business planning;
7. describe contemporary entrepreneurial issues in Nigeria, Africa and the rest of the world; and
8. state the basic principles of e-commerce.

Course Contents

Concept of Entrepreneurship (Entrepreneurship, Intrapreneurship/Corporate Entrepreneurship,). Theories, Rationale and relevance of Entrepreneurship (Schumpeterian and other perspectives, Risk-Taking, Necessity and opportunity-based entrepreneurship and Creative destruction). Characteristics of Entrepreneurs (Opportunity seeker, Risk taker, Natural and Nurtured, Problem solver and change agent, Innovator and creative thinker). Entrepreneurial thinking (Critical thinking, Reflective thinking, and Creative thinking). Innovation (Concept of innovation, Dimensions of innovation, Change and innovation, Knowledge and innovation). Enterprise formation, partnership and networking (Basics of Business Plan, Forms of business ownership, Business registration and Forming alliances and joint ventures). Contemporary Entrepreneurship Issues (Knowledge, Skills and Technology, Intellectual property, Virtual office, Networking). Entrepreneurship in Nigeria (Biography of inspirational Entrepreneurs, Youth and women entrepreneurship, Entrepreneurship support institutions, Youth enterprise networks and Environmental and cultural barriers to entrepreneurship). Basic principles of e-commerce.

ANA 203: General and Systemic Embryology

(2 Units C: LH 30)



Learning Outcomes

At the end of this course, students should be able to:

1. explain how the embryo is form from the zygote;
2. discuss the role of cleavage and gastrulation in animal development;
3. demonstrate; understanding of embryology and significance of prenatal diagnostic methods;
4. describe structural features of primordia in tissue and organs at different developmental stages;
5. define risk periods in histo- and organogenesis; and
6. analyse the most often observed developmental anomalies.

Course Contents

Spermatogenesis, oogenesis; ovarian follicles; ovulation; corpus luteum; menstruation; uterine cycle; hormonal control of uterine cycle; fertilisation; cleavage; implantation; reproductive technologies-IVF/surrogacy/embryo transfer; embryo manipulation & potency/twinning; molecular embryology and transgenesis; gastrulation; notochord, neurulation; derivatives of the germ layers; folding of the embryo; fetal membranes; placenta; development of limbs and teratology. Growth and perinatology; congenital malformations – general introduction. The cardiovascular system, skin, structure of the nails and hair. Macrophagic system; cellular immunology; lymphoid organs; glands – endocrine and exocrine. Respiratory system. Digestive system. Urinary and genital systems. Electron micrograph studies of each organ.

BCH 201: General Biochemistry I

(2 Units C: LH 30)

Learning Outcomes

At the end of the lectures, students should be able to:

1. explain the structure of different macromolecules in biological system;
2. identify types of chemical reactions involving these macromolecules;
3. explain the various methods of isolation of these macromolecules;
4. estimate the effects of acids and alkalis on the macromolecules;
5. describe purification of macromolecules; and
6. discuss quantification of the various macromolecules.

Course Contents

Introductory chemistry of amino acids, their properties, reactions and biological functions. Classification of amino acids: neutral, basic and acidic; polar and non-polar; essential and non-essential amino acids. Peptides. Introductory chemistry and classification of proteins. Biological functions of proteins. Methods of their isolation, purification and identification. Primary, secondary, tertiary and quaternary structures of proteins. Basic principles of tests for proteins and amino acids. Introductory chemistry of carbohydrates, lipids and nucleic acids. Nomenclature of nucleosides and nucleotides, effects of acid and alkali on hydrolysis of nucleic acids.



BCH 203: General Biochemistry Practical

(1 Unit C: PH 45)

Learning Outcomes

At the end of the course, students Should be able to:

1. describe the various laboratory procedures used in the study of various biochemical processes.

Course Contents

Laboratory experiments designed to reflect the topics covered in BCH 201 and BCH 202. Introduction to laboratory methods and procedures employed in studying biochemical processes.

MCB 201: Introduction to Microbiology

(2 Units C: LH 30)

Learning Outcomes

At the end of this course, students should be able to:

1. describe bacterial morphology and cell structure;
2. explain growth and reproduction of microorganisms;
3. give overview of microbial metabolism;
4. classify microorganisms;
5. explain prevention and control of microbial diseases;
6. discuss the relationship between microorganisms, environment, agriculture, industries and many others.; and
7. explain microbial ecology.

Course Contents

History and scope of microbiology; the general characteristics of microorganisms. Prokaryotic and eukaryotic microorganisms. Bacterial morphology and cell structure. Growth and reproduction of microorganisms. Microbial metabolism, antimicrobial agents. Systematic classification of bacteria, fungi, viruses, algae and protozoa; Microbial ecology, Microbial growth and identification, Prevention and control of microbial diseases, microbes in relation to environment, agriculture and industries.

NUT 201: Principles of Nutrition and Dietetics

(2 Units C: LH 30)

Learning Outcomes

At the end of this course, students should be able to:

1. discuss basic nutrition principles;
2. describe the concept of digestion, absorption and functions of nutrients;
3. discuss principles of energy balance;
4. explain the determinants of food choices;
5. explain the effects of anti-nutrients and nutrient-nutrient interaction;
6. discuss with dietary guidelines;
7. give an overview of food and nutrition security;
8. explain the concept of dietary diversity;
9. identify the non-conventional foods;
10. discuss the concept of food enrichment, supplementation and fortification; and
11. give an overview of basic nutrition evaluation methods.



Course Contents

Basic nutrition principles with special emphasis on nutrients (protein, carbohydrate, fat, minerals, vitamins, and water); sources, functions, digestion and absorption and their problems (signs and symptom of deficiency diseases). An in-depth discussion on foods, their characteristics, effects of anti-nutrients, and nutrient – nutrient and nutrient-drug interactions. Recommended dietary and nutrient intakes, safe levels of nutrient intake, balance studies to determine nutrient requirements will be addressed.

NUT 202: Introduction to Clinical Nutrition

(2 Units C: LH 30)

Learning Outcomes

At the end of this course, students should be able to:

1. explain the concept of malnutrition;
2. describe the conceptual framework for the courses of malnutrition;
3. explain nutrition-related diseases; and
4. give overview of nutrition in the prevention and management of diseases.

Course Contents

Malnutrition as a health problem. Nutritional problems of public health importance. Causes of Nutritional problems. Prevention of nutritional problems. Classification of nutritional diseases, diseases due to biological and chemical toxicants in foods. Diet and dental diseases. Diet and cancer. Nutritional basis of diseases- renal, liver, gastrointestinal, Diabetes, hypertension and many others. Nutritional application to management of diseases. Inborn errors of metabolism, metabolic diseases and allergies. Nutrition and immunity. Parental nutrition.

BIO 208 Biostatistics

(2 Units C: LH 30)

Learning Outcomes

At the end of the lectures in this course, students should be able to:

1. differentiate between continuous and discontinuous data;
2. explain sampling procedures in biology;
3. summarise and present biological data;
4. describe measures of central tendency and probability theory; and
5. conduct ANOVA, Chi-square, t-tests and F-tests and state their importance.

Course Contents

Variability in biological data: Continuous and discontinuous variables; statistical sampling procedures – observations and problems of estimation; Representation and summarisation of biological data; Frequency distribution; Measures of central tendency and dispersion; Probability theory; Normal, binomial and Poisson distribution; t-test, F-test and chi-square test, Analysis of variance (ANOVA) and covariance; Principles of experimental design; Correlation, linear and curvilinear regression; Transformation.



PIO 201 Introductory Physiology and Blood

(2 Units C: LH 30)

Learning Outcomes

At the end of this course, students should be able to:

1. describe the composition of a cell membrane;
2. explain how a potential difference across a membrane will influence the distribution of a cation and an anion;
3. describe how transport rates of certain molecules and ions are accelerated by specific membrane transport proteins;
4. distinguish between active (primary and secondary) transport, facilitated diffusion, and passive diffusion based on energy source and carrier protein involvement;
5. identify the mechanisms and role of selective transporters for amino acids, neurotransmitters, nutrients, etc.;
6. explain the general concepts of homeostasis and the principles of positive and negative feedback in physiological systems;
7. identify the site of erythropoietin production, the stimulus for its release, and the target tissue for erythropoietin action;
8. discuss the normal balance of red blood cell synthesis and destruction, including how imbalances in each lead to anemia or polycythemia;
9. list and differentiate the various types of leukocytes;
10. describe the role of thrombocytes in haemostasis; and
11. list clotting factors and the discuss the mechanism of anti-coagulants.

Course Contents

Introduction and history of physiology. Structure and functions of cell membranes. Transport process. Special transport mechanism in amphibian bladder, kidney, gall bladder, intestine, astrocytes and exocrine glands. Biophysical principles. Homeostasis and control systems including temperature regulation. Biological rhythms. Composition and functions of blood. Haemopoiesis. WBC and differential count. Plasma proteins Coagulation, fibrinolysis and platelet functions. Blood groups –ABO system – Rh system. Blood transfusion – indication for collection and storage of blood, hazards of blood transfusions. Reticulo- endothelial system. Immunity and immunodeficiency disease and HIV.

GST 312: Peace and Conflict Resolution

(2 Units C: LH 30)

Learning Outcomes

At the end of the course, students should be able to:

1. analyse the concepts of peace, conflict and security;
2. list major forms, types and root causes of conflict and violence;
3. differentiate between conflict and terrorism;
4. enumerate security and peace building strategies; and
5. describe roles of international organisations, media and traditional institutions in peace building.



Course Contents

Concepts of Peace, Conflict and Security in a multi-ethnic nation. Types and Theories of Conflicts: Ethnic, Religious, Economic, Geo-political Conflicts; Structural Conflict Theory, Realist Theory of Conflict, Frustration-Aggression Conflict Theory. Root causes of Conflict and Violence in Africa: Indigene and settlers Phenomenon; Boundaries/boarder disputes; Political disputes; Ethnic disputes and rivalries; Economic Inequalities; Social disputes; Nationalist Movements and Agitations; Selected Conflict Case Studies – Tiv-Junkun; Zango Kartaf, Chieftaincy and Land disputes and many others. Peace Building, Management of Conflicts and Security: Peace & Human Development. Approaches to Peace & Conflict Management --- (Religious, Government, Community Leaders and many others.). Elements of Peace Studies and Conflict Resolution: Conflict dynamics assessment Scales: Constructive & Destructive. Justice and Legal framework: Concepts of Social Justice; The Nigeria Legal System. Insurgency and Terrorism. Peace Mediation and Peace Keeping. Peace & Security Council (International, National and Local levels) Agents of Conflict resolution – Conventions, Treaties Community Policing: Evolution and Imperatives. Alternative Dispute Resolution, ADR. Dialogue b). Arbitration, c). Negotiation d). Collaboration and many others. Roles of International Organisations in Conflict Resolution. (a). The United Nations, UN and its Conflict Resolution Organs. (b). The African Union & Peace Security Council (c). ECOWAS in Peace Keeping. Media and Traditional Institutions in Peace Building. Managing Post-Conflict Situations/Crisis: Refugees. Internally Displaced Persons, IDPs. The role of NGOs in Post-Conflict Situations/Crisis.

ENT 312: Venture Creation

(2 Units C: LH 15; PH 45)

Learning Outcomes

At the end of this course, students, through case study and practical approaches, should be able to:

1. describe the key steps in venture creation;
2. spot opportunities in problems and in high potential sectors regardless of geographical location;
3. state how original products, ideas, and concepts are developed;
4. develop business concept for further incubation or pitching for funding;
5. identify key sources of entrepreneurial finance;
6. implement the requirements for establishing and managing micro and small enterprises;
7. conduct entrepreneurial marketing and e-commerce;
8. apply a wide variety of emerging technological solutions to entrepreneurship; and
9. appreciate why ventures fail due to lack of planning and poor implementation.

Course Contents

Opportunity Identification (Sources of business opportunities in Nigeria, Environmental scanning, Demand and supply gap/unmet needs/market gaps/Market Research, Unutilised resources, Social and climate conditions and Technology adoption gap). New business development (business planning, market research). Entrepreneurial Finance (Venture capital, Equity finance, Micro finance, Personal savings, small business investment organisations and Business plan competition). Entrepreneurial marketing and e-commerce (Principles of marketing, Customer Acquisition & Retention, B2B, C2C and B2C models of e-commerce, First Mover Advantage, E-commerce business models and Successful E-Commerce Companies,). Small Business Management/Family Business: Leadership & Management, Basic book keeping, Nature of family business and Family Business Growth Model. Negotiation and Business communication (Strategy



and tactics of negotiation/bargaining, Traditional and modern business communication methods). Opportunity Discovery Demonstrations (Business idea generation presentations, Business idea Contest, Brainstorming sessions, Idea pitching). Technological Solutions (The Concept of Market/Customer Solution, Customer Solution and Emerging Technologies, Business Applications of New Technologies - Artificial Intelligence (AI), Virtual/Mixed Reality (VR), Internet of Things (IoTs), Blockchain, Cloud Computing, Renewable Energy and many others. Digital Business and E-Commerce Strategies).

NUT 301: Food Composition, Analysis & Sensory Evaluation (2 Units C: LH 15; PH 45)

Learning Outcomes

At the end of this course, students should be able to:

1. discuss the concept of INFOODS learning module of FAO;
2. explain the chemical methods for determining the constituents of food and diets;
3. discuss data presentation methods and nutritional interpretation of such data;
4. describe the basic principle of food composition data generation;
5. list the components of food composition tables and databases;
6. conduct food analysis and draft food composition table; and
7. practice sensory evaluation of foods.

Course Contents

The course content will be delivered using FAO/INFOODS e-learning module as a teaching guide. Introduction to the chemical methods for determining the constituents of food and diets. Data presentation and nutritional interpretation of such data. Basic principle of food composition data, food composition tables and databases. Food description with emphasis on food selection and nomenclature. Food components: Definition and selection, calculation and conversion of components and units' quality consideration and compilation including food component analysis. Quality consideration in food composition including quality data and biodiversity. Compilation of food composition data with emphasis on the compilation principles and recipe calculation. Biological assay; chromatography; introduction to basic analytical equipment.

NUT 302: Diet Therapy and Hospital Practical I

(3 Units C: LH 15; PH 90)

Learning Outcomes

At the end of this course, students should be able to:

1. plan, prepare and present various therapeutic diets in the management of diseases; and
2. conduct case studies using nutrition care process approach to manage patients.

Course Contents

Fundamental principles of Diet therapy. History, aims, scope and roles of dietitians. Introduction to different diets (fluid diet, soft diet low residual diet and many others.) Dietary management in disease states (gastro intestinal disorders, various DR-NCDs including Diabetes hypertension and many others.) consideration of factors in patients care plan, coordinated nutritional services for patients, therapeutic adaptation of the normal diet and problems of planning therapeutic diets using local foods. Principles or nutritional modification for the underweight, acute malnutrition (moderate or severe SAM/MAM), nutrient need in surgery – postoperative nutritional care following gastrointestinal tract surgery; study of the diet for the vulnerable groups, diarrhoea in infants; oral rehydration. Use of food exchange list. Nutritional care process. Critical care.



NUT 303: Nutritional Assessment and Food Consumption Studies (2 Units C: LH 30)

Learning Outcomes

At the end of this course, students should be able to:

1. explain the direct and indirect methods of nutrition assessment;
2. demonstrate anthropometric, biochemical, clinical and dietary intake assessment methods;
3. identify the various parameters used in food consumption survey; and
4. discover the socio-cultural patterns of food behaviour, food habits, and determinants of food choice and nutrition transition.

Course Contents

Socio-cultural patterns of food behaviour, food habits, and determinants of food choice and nutrition transition. Execution of nutrition surveys of individual and groups in institution, in urban and rural setting. Methods used in nutrition surveys: anthropometry (stunting, wasting, underweight, overweight/obesity), food balance sheets, morbidity and mortality vital statistics, clinical signs, growth monitoring, growth chart methods construction and use of questionnaires, various parameters used in food consumption surveys. methodology in collecting food consumption data (direct methods: weigh food intake, 24-hour dietary recall, food frequency questionnaire, estimated food record and many others.) and indirect methods - food balance sheet, data processing and calculation of various nutrients, interpretation of data collected and use of survey results. Food composition tables.

NUT 304: Research Methods in Nutrition and Dietetics (3 Units C: LH 15; PH 90)

Learning Outcomes

At the end of this course, students should be able to:

1. outline the principles of scientific research;
2. explain the concept of hypothesis formulation and testing;
3. design and implement research in nutrition and dietetics;
4. discuss implementation Science in Nutrition; and
5. apply statistical software in the analysis of nutrition research, organisation of scientific report

Course Contents

Research methodologies currently in use in nutritional studies. Research Ethics. Research design. Sampling techniques and sample size determination. Quantitative and Qualitative Research Methods: Type and design of questionnaire, Focus Group Discussion, Key Informant Interviews. Data collection, data analysis including use of computer based analytical packages such as SPSS, EPI-INFO, STATA and many others. Data presentation, interpretation and discussion of results. Use of Computer in Research (Internet Access). Techniques used in nutrition studies involving laboratory animal and man PER, NPU, BV, NDPE and many others. Use of experimental diets, balance studies, chemical and biological assays.



NUT 305: Nutrition Education and Communication

(2 Units C: LH 30)

Learning Outcomes

At the end of this course, students should be able to:

1. explain the concept of Nutrition Education and Communication;
2. develop communication skills;
3. discuss the FAO ENACT Course;
4. conduct field activities for the ENACT Modules; and
5. explain the concept of the monitoring and evaluation in nutrition education project.

Course Contents

The course should be delivered using the FAO ENACT course module. Definitions, goals and objectives of nutrition education; Learning objectives; Factors influencing teaching and learning; Nutrition problems and causes; The place of nutrition education in solving nutrition problems; Activity-oriented programmes adopted in fostering nutrition education and nutritional status of people; Communicating nutrition education – the source, the message (content) and the recipient; Nutrition education approaches; Learning methods (tutorials and mini projects) in nutrition education; Instructional technologies used in nutrition education; Programme planning and evaluation in nutrition education; Principles of nutrition advocacy; Behavioural change communication for healthy living; Information, education and communication (IEC) strategies; Communication skills and technical information.

NUT 399: Students' Industrial Work Experience I

(6 Units C: PH 270)

Learning Outcomes

At the end of this course, students should be able to:

1. conduct six (6) months of the SIWES in food/nutrition – related industry/organisation; and
2. gain experience and report on activities conducted during the six (6) months of the in food/nutrition – related industry/organisation.

Course Contents

Students will be posted to recognised and relevant placement areas of their choice during the industrial training. Six (6) months of the industrial training will be spent in hotels, food industry and any other food and nutrition related establishment. Continuous assessment of students will be undertaken jointly by their industrial-based supervisors, ITF officials and institutional supervisors. Finally, students on returning to the institution will present a seminar on major duties performed and skills acquired during the training. Grades are allotted according to ITF directives.

NUT 401: Advanced Food Preparation

(2 Units C: LH 30)

Learning Outcomes

At the end of this course, students should be able to:

1. explain the principles of food preparation;
2. describe methods of preparing different types of foods and meals for special groups;
3. describe food demonstration techniques;and
4. list the strategies for improving nutrient value and utilisation of the traditional and non traditional meals.



Course Contents

The application of principles of nutrition and management to planning and preparation of meals for special groups (institutions: boarding schools, remand homes, orphanages, armed forces, prisons, hospitals, and many others.) and special occasions. Control in food experimentation, developing food demonstration techniques; quality characteristics of some important traditional Nigerian food ingredients; strategies for improving nutrient value and utilization of the traditional and non-traditional meals.

NUT 402: Community Nutrition

(3 Units C: LH 45)

Learning Outcomes

At the end of this course, students should be able to:

1. list strategies for the planning, implementation and evaluation of community nutrition programmes;
2. assess factors affecting community nutrition;
3. interpret food and nutrition survey data to guide community nutrition activities; and
4. discuss nutrition interventions in community.

Course Contents

Concept of community nutrition. Planning, organisation and evaluation of Community Nutrition programmes (concept of community participation, social mobilisation, participatory monitoring and evaluation). Assessment of ecological factors affecting community nutrition. Methods of Assessment of nutritional status of individuals and groups in a community. Use of growth and development chart. Economic aspects of nutrition. Food budgets. Food habits. Surveys in rural and urban communities. Applied nutrition programmes and interventions (Nutrition specific and sensitive interventions). School feeding programmes. Nutrition rehabilitation centres. Nutrition and National harmony. Nutrition information and surveillance system. Field visits to communities for nutrition assessment and interventions.

NUT 403: International Nutrition

(2 Units C: LH 30)

Learning Outcomes

At the end of this course, students should be able to:

1. analyse the global nutrition situation;
2. explain the concept of globalisation of food systems;
3. discuss the international nutrition policies and politics;
4. explain the nutrition-related events commemorated globally; and
5. list the roles of international relief agencies, UN and NGOs in international nutrition arena.

Course Contents

Global Nutrition situation. Globalisation of food systems, Concepts of food and nutrition security and strategies. Global harmony through nutrition, Population, gender and world economies. Food biotechnology and nutrition; Multiple burden of malnutrition. World food and nutrition policy formulations. Global environmental protection and nutrition. Nutrition response in emergency. Role of international relief agencies. Political dimensions of Food and Nutrition. United Nation Agencies, Bilateral Organisations and International NGOs. Food subsidy as part of social protection. Nutrition interventions – supplementary feeding programmes (Food aids, food subsidy, food stamps, food for work and many others.), Scaling Up Nutrition Movement (SUN).



NUT 406: Seminar in Nutrition and Dietetics & Proposal Writing (2 Units C: LH 30)

Learning Outcomes

At the end of this course, students should be able to:

1. acquire presentation skills;
2. describe how to search for literature;
3. explain citation and referencing styles;
4. discuss the concept of activity and/or research proposal writing; and
5. present seminar on contemporary nutrition and dietetics.

Course Contents

Proposal writing guidelines; goals and objectives; proposal writing and presentation techniques (PowerPoint presentation, and many others); topic selection, justification, objectives, literature search, methodology, results and discussion. Referencing and many others. Each final year student is expected to present an oral report on contemporary nutrition and dietetics issue based on library research.

NUT 404: Nutrition Planning, Policy and Advocacy

(2 Units C: LH 30)

Learning Outcomes

At the end of this course, students should be able to:

1. explain the existing national and international policies on food and nutrition;
2. discuss the policy formulation process and policy contents;
3. describe the link between nutrition policy and governance;
4. explain the importance of multisectoral nature of nutrition and relevance of coordination; and
5. explain the basic concepts of Advocacy and Advocacy cycle.

Course Contents

Applied nutrition programme planning and implementation. Nutrition policy and governance. Public private partnership. Link between Nutrition and Development. Multisectoral linkages (Agriculture, Nutrition, Health and Education sectors and many others) in Nutrition programme planning and implementation. Monitoring and Evaluation of Nutrition programme. Food laws and regulations. Nutrition labelling. Applications of Codex Alimentarius Commission. Poverty reduction and nutrition security. Nutrition and social protection. Basic concepts of Advocacy: Definition, Importance, Types, process of developing effective advocacy plan, Advocacy tools, development and implementation strategies for effective advocacy.



NUT 405: Public Health Nutrition

(2 Units C: LH 30)

Learning Outcomes

At the end of this course, students should be able to:

1. assess the nutritional status of a community-anthropometry, clinical signs, vital statistics, ecological factors, food consumption, and morbidity, mortality biochemical data;
2. enumerate the determinants of the nutritional status of a community;
3. organise, plan and evaluate sustainable nutrition intervention programme; and
4. identify clinical, social and environmental context of malnutrition.

Course Contents

Conceptual framework of causes of malnutrition. Nutritional problems of public health importance in Nigeria. Principles of Nutrition Epidemiology. Socio-economic effect of nutritional problems. Effect of malnutrition on physical and mental development. Interventions to improve health and nutritional status of people such as Micronutrient deficiencies control (fortification, supplementation, and dietary diversification), child survival strategies, and Essential Nutrition actions, nutrition sensitive and nutrition specific interventions. Food sanitation and safety. Environment and nutrition. Development of primary health care and nutrition in Nigeria. Nutrition and Infection. Nutrition and HIV/AIDS. Maternal and child nutrition including breastfeeding and child spacing. Management of acute malnutrition (CMAM, SAM).

NUT 407: Nutrition Counselling

(2 Units C: LH 30)

Learning Outcomes

At the end of this course, students should be able to:

1. explain the concept of nutrition counselling;
2. discuss the guidelines and roles of nutritionist/dietician in nutrition counselling;
3. develop communication and interview techniques;
4. visit the rights of the client in counselling;
5. apply social and behaviour change communication strategies in counselling for healthy diet; and
6. discuss approaches of nutrition counselling.

Course Contents

Definition and concepts of counselling. Roles of Dietitians/ Nutritionists. Dietary counselling for target patients, application of Behavioural Change Communication for healthy living. Counsellor–Patient relationship. Problems/Barriers to Communication in relation to patients. Development of personal philosophy to problem solving. Different approaches to counselling; steps in dietary counselling. Nutrition counselling at home and in the hospital. The concept of change: The nature of dietary change, implication of dietary change, adapting to dietary change. Patients interviewing techniques. Clients' compliance and associated factors including follow up.



NUT499: Students' Industrial Work Experience II (SIWES II) (6 Units C: PH 270)

Learning Outcomes

At the end of this course, students should be able to:

1. conduct six (6) months of the SIWES in hospital/health care centre; and
2. gain experience and report on activities conducted during the six (6) months of the in hospital/health care centre.

Course Contents

Students will be attached to a hospital/health care centre for a period of six months under the supervision of Registered Dietitian-Nutritionists. They will be exposed to hospital dietetics practice which includes the use of therapeutic diets in the treatment of diseases, counselling of patients/clients, preparation of various therapeutic diets such as clear fluid diet, soft diet, bland diet, and nutrient controlled diets. Practical classes in assessing dietary intake, designing diets and preparing therapeutic diets are an essential part of this course. Students will be graded based on seminar presentation, assessment of their logbooks, attendance and general assessment from their industrial based supervisor.

NUT 501: Advances in Human Nutrition

(2 Units C: LH 30)

Learning Outcomes

At the end of this course, students should be able to:

1. identify the areas of research in human nutrition in developing and developed areas of the world
2. discuss emerging issues in human nutrition and dietetics;
3. explain the concept of nutraceuticals and functional foods;
4. discuss the concept of nutrigenomics and nutrigenetics;
5. discuss the concept of food systems for sustainable healthy diets;
6. discuss the concept of genetically modified diets; and
7. explain the concept of nutrition and climate change.

Course Contents

Priority areas of research in human nutrition in developing and developed areas of the world. Energy balance in man. Measurement of human body composition. Nutrition, learning and mental development. Emerging issues in Human Nutrition and Dietetics: Nutrigenomics, Foetal origin of degenerative diseases, Diet related non-communicable diseases: risk factors, prevention and management; Human right approach to adequate food and nutrition, IYCF and individualized nutrition. Nutrition in Sport and Human Kinetics, Nutraceuticals. Phytochemicals in Human Nutrition, Functional foods, bio-fortification and many others. Computer-aided methods in dietary intake measurement; Issues on Genetically Modified Foods. Food System and Sustainable Diet. Nutrition and Climate change.



NUT 502: Diet Therapy Practical

(2 Units C: PH 90)

Learning Outcomes

At the end of this course, students should be able to:

1. plan, prepare and present various therapeutic diets in the management of diseases; and
2. conduct case studies using nutrition care process approach to manage patients.

Course Contents

The course deals with the planning, preparation and presentation of various therapeutic diets such as standard/normal, fluid, soft, low/high residue, gastric, low calorie, diabetic, high protein, low protein, low salt, low fat, low purine, acid ash/alkaline diets. The practical is based on management of the various non-communicable nutrition-related diseases. Case studies using Nutrition Care Process Approach to Manage Patients.

NUT 503: Nutritional Epidemiology

(2 Units C: LH 30)

Learning Outcomes

At the end of this course, students should be able to:

1. explain the Principles of Nutritional Epidemiology;
2. describe the methods for nutrition epidemiology research;
3. discuss with qualitative, quantitative and mixed methods/design of research;
4. list the application of Nutritional Epidemiology in the prevention of diseases; and
5. describe the statistical analyses methods.

Course Contents

Principles of Nutritional Epidemiology, Reviews of Assessment methods for Populations and Individuals. Diets/Disease Relationships, Correction of Measurement Errors in Nutritional Study, Nutrition Survey & Research Methods in Nutrition, Measures of Association, Inferential Nutritional Epidemiology & Statistics, Multiple determinants of Diseases, Nutritional Surveillance & Notification, Evaluation of Diagnostic and Screening Tests-Specificity, Sensitivity, Validity and Predictive Values, Application of Nutritional Epidemiology to Health care Delivery and Systems Development.

NUT 504: Food Chemistry and Toxicology

(2 Units C: LH 30)

Learning Outcomes

At the end of this course, students should be able to:

1. explain the basic concept of food chemistry and toxicology;
2. describe the structure, chemistry, properties and interactions of food constituents, including nutrient-drug interaction and their effects on nutrient availability;
3. discuss the factors affecting nutrient stability in food products;
4. explain with the health and consumer issues related additives, pesticide residues, contaminants, and many others;
5. discuss food safety, good manufacturing practices, and concepts of Hazard Analysis and Critical Control Point (HACCP); and
6. discuss the national and international guidelines and limits of toxins in foods .



Course Contents

Structure, chemistry, properties and interactions of food constituents, nutrient-drug interaction, effects of these interactions on nutrient availability in foods; Health and consumer issues related additives, pesticide residues, contaminants, carcinogens, drugs/ hormones, and nutrient supplements in relation to content on natural and synthetic chemicals. Environmental factors affecting nutrient stability in food products. Food additives. Food borne diseases. Food safety, Good Manufacturing Practices, and concepts of Hazard Analysis and Critical Control Point (HACCP).

NUT 505: Sports Nutrition

(2 Units C: LH 30)

Learning Outcomes

At the end of this course, students should be able to:

1. explain the concept of sports nutrition;
2. discuss the nutrient requirements for different physical activities;
3. explain the concept of nutrition, physical activity and health.

Course Contents

Introduction to Sport and Exercise Nutrition. Protein needs for exercise and eating for muscle gain. Nutrition for training and for competition preparation. Fluid and fuel intake during competition and training. Vitamins, minerals, antioxidants and the athlete's health. Dietary supplements and ergogenic aids. Weight restricted and weight sensitive sports. Strength and power sports. Nutrition, physical activity and health, Special Populations and Nutritional needs in special environments

NUT 506: Consumer Education

(2 Units C: LH 30)

Learning Outcomes

At the end of this course, students should be able to:

1. discuss the concept of consumer education;
2. discuss consumer protection laws;
3. explain the rights and responsibly of consumers; and
4. explain the role of consumer protection agencies.

Course Contents

Definition and principles of Consumer Education. Analysis of economic forces affecting nutritional status of individuals and families as consumers of goods and services; creating awareness of the rights to food and responsibilities of consumers in the market place; such as nutrition labelling, food safety, street food vending, personal and environmental hygiene, food quackery and understanding of food based dietary guidelines.

NUT 507: Recipe Development and Testing

(3 Units C: LH 15; PH 90)

Learning Outcomes

At the end of this course, students should be able to:

1. apply optimisation principles in food formulation and recipe development;
2. discuss the fundamental principles of food quality evaluation and development of standards;
3. explain the guidelines for conducting sensory evaluation; and



4. describe methods of reporting and interpretation of results of recipe development and testing.

Course Contents

Application of optimisation principles in food formulation and recipe development. Fundamental principles of food quality evaluation and development of standards (taste, flavour, shape, size, texture, colour and appearance). Emphasis on development and testing of more economical and nutritious foods from familiar and commonly used acceptable ingredients. Novel food development. Guidelines for conducting sensory evaluation. Selection of participants, presentation, testing and analysis of results. Practical classes on recipe development, preparation and testing. Reporting and interpretation of results.

NUT 599: Research Project

(4 Units C: PH 180)

Learning Outcomes

At the end of this course, students should be able to:

1. conduct research project on a specific problem in the area of nutrition and dietetics under the supervision of an academic staff;
2. prepare report, present and defend findings of the project before a panel of examiners.

Course Contents

The student is expected to study critically and carry out research on a specific problem in the area of nutrition and dietetics under the supervision of an academic staff. The student will present a project report and defend his/her findings before a panel of examiners.

Minimum Academic Standards

Equipment

Equipment listed below are needed for the following laboratories for Nutrition and Dietetics training:

Human metabolic laboratory
Animal House – for animal experiments
Anthropometric laboratory
Food and diet therapy laboratory
Sensory evaluation laboratory
Food analysis laboratory

| | |
|--------------------------------|---|
| Muffle furnace | 1 |
| Bomb calorimeter | 1 |
| Kjeld hal apparatus | 1 |
| Markham distillation apparatus | 1 |
| Soxhlet extraction apparatus | 1 |
| Vacuum oven | 2 |
| Air Ovens | 2 |
| UV – Visible spectrophotometer | 1 |
| Body composition analyser | 2 |
| Weighing balance | 4 |
| Flame photometer | 1 |



| | |
|---|----------|
| Freeze dryer | 1 |
| Centrifuges | 2 |
| Water bath | 3 |
| Mortar and pestle | 5 |
| Crucibles with lids | 10 |
| Weighing/drying can | 30 |
| Glass wares | |
| Volumetric flasks | |
| Burettes | |
| Pipette | |
| Conical flasks | |
| Beakers | |
| Thermometers | |
| Measuring cylinder | |
| NB: Minimum of 20 of each item | |
| Retort Stands with clamps | 15 |
| Wash Bottles | 15 |
| Filter papers (Various sizes) | 10 packs |
| Bunsen Burner | 10 |
| Industrial Gas Cylinder with Gas | 1 |
| Chemical Reagents and Standards | |
| Anthropometric laboratory | |
| Stadiometers / Measuring Tape | 2 |
| Electronic Weighing Scale for adults | 2 |
| Electronic Weighing Scale for Children | 2 |
| Electronic Weighing Scale for Babies | 2 |
| Hanging Scale for Babies | 2 |
| Length Board for Babies | 3 |
| Skinfold Callipers | 5 |
| Mid-Upper Arm Circumference Tape | 4 Packs |
| Food Models | One set |
| Growth Monitoring Charts | |
| Growth Monitoring Cards | |
| Charts showing the procedure for various anthropometric assessment | |
| Laptop or Desktop Computers with nutrition software including WHO Anthro, WHO Anthro Plus, ENA, Food Processor, NVivo software, SPSS OR STATA or other statistical analysis package | |
| Projector | |
| Body Composition Analyser | |
| PCV test kits | |
| Glucometer | |
| Hand grip dynamometers | |
| Blood pressure monitors | |
| Accelerometers | |
| Neurosoftware | |



| | |
|--|---|
| Animal House with metabolic cage | |
| Feeding through | |
| Well ventilated room with lighting system | |
| E-Laboratory | 20-25 Internet Ready Laptops or Desktops with relevant software already installed |
| Dietetic kitchen | |
| Pressure Cooking Pots | 2 |
| Cooking Pots of various sizes | 3 sets |
| Blenders | 2 |
| Food Mixer | 2 |
| Cutleries | 3 sets |
| Food weighing Scale | 3 |
| 4-Gas Cooker with Oven | 4 |
| Gas Cylinder with gas | 4 |
| Tea cups, glass cups, wine glass | 2 sets each |
| Water jug | 5 |
| Kitchen Knives | 5 |
| Serving spoons | 2 sets |
| Serving Trays | 5 sets |
| Dinner sets | 2 sets |
| Serving Plates | 3 sets |
| Dietary Guideline Charts | |
| Food Group Charts | |
| Food Composition Tables (Nigerian, West African, and many others) | |
| Dining tables with chairs | 4 sets |
| Work benches | 6 |
| Sensory evaluation laboratory with cubicles, tap water and water dispensers with water. Saucers, cutleries, cups, flat plates and bowls. | 30 private cubicles with chairs |

| | |
|----------------------------|---|
| Amino analyser | 1 |
| AAS/HPLC | 1 |
| Spectronic 20 | 1 |
| Photoelectric calorimeter | 2 |
| Universal Bench centrifuge | 2 |
| Hot plate magnetic stirrer | 2 |
| Deep freezer | 2 |
| Stadiometer | 2 |
| Haematocrit centrifuge | 1 |
| Infant scales | 2 |
| Flame photometer | |
| ACCU-check glucpometer | 4 |
| Blood pressure monitor | 2 |
| Inelastic meter tape | |



Quantum resonance magnetic analyser 1
Omron karada scan body composition monitor 1

Table 1. List of anthropology lab. equipment

| S/ N | Equipment | Quantity |
|-------------|---|-----------------|
| 1 | BMI Scale with stadiometer | 5 |
| 2 | Sphygmomanometer | 50 |
| 3 | Stethoscope | 50 |
| 4 | Vernier callipers | 3 |
| 5 | Spreading vernier callipers | 3 |
| 6 | Pelvic meter | 5 |
| 7 | Tape rule | 50 |
| 8 | Plastic rulers | 120 |
| 9 | Digital camera with high resolution such as canon | 5 |
| 10 | Tripod | 5 |
| 11 | Fingerprints scanner | 5 |
| 12 | Craniometer | 5 |
| 13 | Laptop | 5 |
| 14 | Video recorder | 5 |
| 15 | Audio recorder | 5 |
| 16 | Mid upper arm circumference tape | 100 |
| 17 | Anthropometric wall charts | Various types |
| 18 | Grip dynameter | 10 |
| 19 | Harpender calliper | 5 |
| 20 | Spirometer | 20 |
| 21 | Wall mounted stadiometer | 5 |
| 22 | Digital refractometers benchtop and portable | 3 each |

Staffing

Academic staff

The Teacher/Students ratios for the Basic courses would be 1:15 while the ratios for Clinical courses would be 1:10. The staff mix is expected to be as follows:

Professional/Readership - 30%

Senior Lectureship - 40%

Lectures 1 and Below - 30%

To be appointable as Lecturer 1, the academic staff should possess Ph.D. or Fellowship in the relevant professional discipline.



Non-academic staff

It is expected that Non-Academic staff to support the teaching of students will be as follows:

Senior non-teaching Staff - 1:30

Students administrative staff - 50% of Academic Staff

Library

Adequate reading materials and literature must be provided for each programme in the University/College/Faculty Libraries with modern ICT facilities and internet connectivity. Where possible departmental library and reading rooms should be provided. E-Library with up-to-date subscription to relevant resources/databases.

Classrooms, Laboratories, Workshops and Offices Space

Classroom

The standard requirement of 0.65m² per full-time student should be maintained. Thus the minimum total space requirement for a faculty or department shall be the product of its total full time equivalent student enrolment (FTE) and the minimum space requirement per full-time equivalent i.e. (FTE) 0.65m².

Office

In this respect, each academic staff should have an office space of at least 25 square metres taking into cognisance the status/cadre of the staff

In addition, there should be for the Faculty, a Dean's office and for each Department a Head of Department's office with attached offices for their supporting staff as specified below in m²:

| | | |
|----------------------------------|---|-------|
| Professor's office | - | 18.50 |
| Head of Department's office | - | 18.50 |
| Tutorial teaching staff's office | - | 13.50 |
| Other teaching staff space | - | 7.00 |
| Technical staff space | - | 7.00 |
| Secretarial space | - | 7.00 |
| Staff research laboratory | - | 16.50 |
| Seminar Space/per student | - | 1.85 |
| Laboratory space (per student) | - | 7.50 |



B.OT Occupational Therapy

Overview

Rapidly changing healthcare systems are demanding more of entry-level practitioners. This Bachelor of Occupational Therapy (OT) curriculum is meeting this need by providing academic preparation at a generalist level for OT practitioners, including advanced graduate knowledge, skills and fieldwork/experiential opportunities. The mandate of the Bachelor programme is to advance the course of education, pursue research and research training that is translated into evidenced based OT practice.

The Bachelor of Occupational Therapy curriculum is a five-year, full-time programme that is completed in 10 consecutive semesters; two years of pre-clinical study in basic, behavioural and basic medical science subjects and three years of clinical science subjects. The degree programme is structured to produce effective and efficient graduates that possess the adequate practical and theoretical capacity for an entry-level occupational therapist with demonstrated competence to tackle all health diagnoses through continued research. The Occupational Therapy curriculum offers students the opportunity to focus on individual professional growth which enables the trainee to:

1. participate in community service learning/training;
2. refine cultural sensitivity and practice skills;
3. use health promotion in community setting to develop skills for treating the whole person, including physical, cognitive and psycho-social needs; and
4. use activity to promote health and independence.

Philosophy

Occupational Therapy (OT) is an holistic health and social care profession premised on the belief that occupation may be used for health promotion and wellness, remediation of impairment or restoration of function, health maintenance, disease and injury prevention, and compensation/adaptation of activities and environment. This profession is built on seven main concepts namely: altruism, equality, freedom, justice, dignity, truth and prudence. Philosophically, the B. Occupational Therapy curriculum should reflect the perspective that students' learning must be nurtured and allowed to mature over time since rudimentary content knowledge must be comprehended, applied, analyzed and synthesized prior to evaluation. The training of Occupational Therapists should be guided by the guidelines of the World Federation of Occupational Therapists (WFOT) and the Medical Rehabilitation Therapist Board of Nigeria (MRTB). Academics are encouraged to facilitate reasoning using instructional methods that appeal to multiple learning styles while developing higher-order intellectual and clinical skills. The curriculum is structured such that facilitators are ever supporting in content, application, and problem-solving skills, striving to integrate hands-on, multi-faceted methods into the same instructional unit to train professionals who will render proficient community service.

Occupational health techniques are clearly demonstrated in the classroom where students initially see, hear, and communicate basic knowledge that is applied theoretically to controlled case studies and problem-solving situations. As students enter the laboratory and clinical settings, students develop erudite critical thinking skills, thus providing additional framework for new content. This process of ever-refining reasoning and diagnostic skills is continuously supervised, monitored, and evaluated formally and informally until students graduate from the programme.



By layering pedagogical methods with orderly sequenced information presented in carefully crafted units, the classrooms and laboratories become not only opportunities for learning, but also treasure chests of knowledge that the facilitator and learner simultaneously unpack in an experiential community, creating an intricately orchestrated educative experience that grows all participants personally, professionally, spiritually and psycho-socially.

Objectives

The objectives of the Occupational Therapy programme are to:

1. train occupational therapists who are adequately equipped in knowledge of occupational science and professional skills in the diagnostic, therapeutic and rehabilitative component of OT and who with therapeutic use of self, knowledge occupational performance and the appropriate use of adaptive equipment will be an active and useful member of the health team in effective management and medical rehabilitation of patients;
2. produce occupational therapists who will act as first-contact practitioners providing a range of primary care and referrals within diverse work settings;
3. train occupational therapy professionals who will be prepared for all responsibilities and privileges of autonomous practice and who will be able to cope with the expanding role of OT within a dynamic health care system;
4. train occupational therapists who will act as independent consultants, provide evidence-based occupational therapy services throughout the continuum of patient care and who will participate effectively in the multi-disciplinary team;
5. produce occupational therapists who will provide clinical, managerial, and leadership roles and who will contribute to public debate about health and wellness issues; and
6. produce occupational therapists who will be adaptable, knowledgeable, reflective, self-assured and service-oriented. They are to be prepared to participate in a broad spectrum of activities from professional development to health promotion through comprehensive rehabilitation of patients.

Unique Features of the Programme

It is designed to produce Occupational Therapists who are sensitive to the healthcare needs of Nigerians. Graduates will be able to work in a culturally diverse country like Nigeria and be globally competitive.

Employability Skills

1. a good mastery of the basic occupational therapy procedures by utilising the Occupational Therapy process to enable Occupation;
2. demonstration of practice knowledge by exhibiting an understanding of the concept of health care system and health care;
3. assumption of professional responsibility for safe, ethical and effective practice: be law abiding and practice within the ethical limits of the profession; respect the dignity of the patient and exhibit high sense of responsibility in patient care;
4. use of critical reasoning and reflection approaches for safe, ethical and effective practice as well as engages in professional development;
5. use of effective communication and collaborative approaches for effective practice; and
6. case consultation skills with particular focus on functional challenges, tasks' demands, and occupational performance within the person's environment



21st Century Skills

The programme will lead to the development of the following 21st century skills in the students:

1. collaboration and team work;
2. creativity and imagination;
3. critical thinking;
4. problem solving;
5. flexibility and adaptability;
6. information Literacy;
7. leadership;
8. civic literacy and citizenship;
9. social responsibility;
10. technology literacy; and
11. initiative.

Admission and Graduation Requirements

Admission Requirements

The minimum requirements for admission to the Occupational Therapy programme include the following:

Five-Year Degree Programme: Through the Unified Tertiary Matriculation Examination (UTME) into 100 level of the programme. Candidates must satisfy the university minimum requirements of five credits passes at SSC (or its equivalent), which must include Mathematic, Physics, Biology, Chemistry and English Language.

Direct Entry: Candidates must satisfy the university minimum requirements of five credits passes at SSC (or its equivalent) two of which must be at the advanced level or its equivalent qualification in the following subjects: Biology, Physics, and one other Science subject into 200 level of the programme.

A Diploma degree certificate in Occupational Therapy at minimum of lower credit level from a training institution recognised by the Medical Rehabilitation Therapist Board of Nigeria (MRTBN).

Graduation Requirements

To graduate, a student should have undergone four or five years of study depending on his/her entry point, including 6 months industrial training. Course workload must meet the graduation requirements of the University.

To be eligible for graduation, students must fulfil all undergraduate and institutional requirements. These requirements shall include:

1. successful completion of all required prerequisite and basic sciences courses.
 2. successful completion of required basic medical science courses.
 3. successful completion of required courses on OT core competency.
 4. Successful completion of first and second clinical work experience in the fourth and fifth years of study respectively.
 5. Successful defence of the undergraduate dissertation, project or critically appraised topic.
- Students must fulfil both the academic and clinical work requirements for graduation. Students who do not pass clinical work experiences will not be considered eligible regardless of performance in the other domain. Although clinical work is an extension of didactic coursework, clinical work requires knowledge and skills which are different from those required in the classroom. Upon successful completion of the graduation requirements, students shall then sit



for the Medical Rehabilitation Therapists Board of Nigeria Examination and be inducted into the Occupational Therapy profession as an Intern.

Global Course Structure

100 Level

| Course code | Course Title | Unit(s) | Status | LH | PH |
|-------------|--------------------------------|-----------|--------|----|----|
| GST 111 | Communication in English | 2 | C | 15 | 45 |
| GST 112 | Nigerian Peoples and Culture | 2 | C | 30 | - |
| BIO 101 | General Biology I | 2 | C | 30 | - |
| BIO 102 | General Biology II | 2 | C | 30 | - |
| BIO 107 | General Biology Practical I | 1 | C | - | 45 |
| BIO 108 | General Biology Practical II | 1 | C | - | 45 |
| CHM 101 | General Chemistry I | 2 | C | 30 | - |
| CHM 102 | General Chemistry II | 2 | C | 30 | - |
| CHM 107 | General Chemistry Practical I | 1 | C | - | 45 |
| CHM 108 | General Chemistry Practical II | 1 | C | - | 45 |
| MTH 101 | Elementary Mathematics | 2 | C | 30 | - |
| PHY 101 | General Physics I | 2 | C | 30 | - |
| PHY 102 | General Physics II | 2 | C | 30 | - |
| PHY 107 | General Physics Practical I | 1 | C | - | 45 |
| PHY 108 | General Physics Practical II | 1 | C | - | 45 |
| | Total | 24 | | | |

200 Level

| Course code | Course Title | Unit(s) | Status | LH | PH |
|-------------|---|-----------|--------|----|----|
| GST 212 | Philosophy, Logic and Human Existence | 2 | C | 30 | - |
| ENT 211 | Entrepreneurship and Innovation | 2 | C | 30 | - |
| ANA 201 | Anatomy of Upper and Lower Limbs | 3 | C | 30 | 45 |
| ANA 203 | General and Systemic Embryology | 2 | C | 30 | - |
| BCH 201 | General Biochemistry I | 2 | C | 30 | - |
| BCH 202 | General Biochemistry II | 2 | C | 30 | - |
| BCH 203 | General Biochemistry Practical | 1 | C | - | 45 |
| PIO 201 | Introductory Physiology and Blood | 2 | C | 30 | - |
| PIO 203 | Physiology of excitable Tissues | 2 | C | 30 | |
| PIO 218 | Introduction to Laboratory Physiology 1 | 1 | C | - | 45 |
| | Total | 20 | | | |



300 Level

| Course code | Course Title | Unit(s) | Status | LH | PH |
|--------------------|---|----------------|---------------|-----------|-----------|
| GST 312 | Peace and Conflict Resolution | 2 | C | 30 | - |
| ENT 312 | Venture Creation | 2 | C | 15 | 45 |
| BCH 304 | Chemistry & Metabolism of Amino Acids & Protein | 2 | C | 30 | - |
| OCT 311 | Introduction to Occupational Therapy & Basic Procedures for Rehabilitation Professionals and Ethics | 2 | C | 30 | - |
| OCT 312 | Occupational Therapy Theory & Practice | 2 | C | 30 | - |
| OCT 313 | Pathology for Occupational Therapy | 2 | C | 30 | - |
| OCT 314 | Pharmacology for Occupational Therapy | 2 | C | 30 | - |
| COS 201 | Programming for Rehabilitation Professionals | 2 | C | 15 | 45 |
| OCT 322 | Developmental Psychology | 2 | C | 30 | - |
| OCT 323 | Therapeutic Skills and Activity Analysis | 2 | C | 30 | - |
| OCT 324 | Kinesiology | 2 | C | 30 | - |
| | Total | 22 | | | |

400 Level

| Course code | Course Title | Unit(s) | Status | LH | PH |
|--------------------|---|----------------|---------------|-----------|-----------|
| OCT 411 | Neuroscience for Occupational Therapy | 2 | C | 30 | - |
| OCT 412 | Assistive Technology, Prosthetics and Orthotics | 2 | C | 15 | 45 |
| OCT 413 | Introduction to Clinical Work in OT I | 2 | C | - | 90 |
| OCT 414 | Physical Dysfunction and Rehabilitation I | 2 | C | 30 | - |
| OCT 415 | Occupational Therapy in Paediatrics I | 2 | C | 30 | - |
| OCT 421 | Neuro-Rehabilitation for OT | 2 | C | 30 | - |
| OCT 422 | Physical Dysfunction and Rehabilitation II | 2 | C | 30 | - |
| OCT 423 | Occupational Therapy In Paediatrics II | 2 | C | 30 | - |
| OCT 424 | Introduction to Clinical Work in OT II | 2 | C | - | 90 |
| OCT 425 | Research Methods in Medical Rehabilitation | 2 | C | 30 | - |



| | | | | | |
|--|--------------|-----------|--|--|--|
| | Total | 20 | | | |
|--|--------------|-----------|--|--|--|



500 Level

| Course code | Course Title | Unit(s) | Status | LH | PH |
|-------------|---------------------------------------|-----------|--------|----|-----|
| OCT 511 | Imaging and Physical Diagnosis | 2 | C | 15 | 45 |
| OCT 512 | Ergonomics and Universal Design | 2 | C | 30 | - |
| OCT 513 | Clinical Work in OT I | 2 | C | - | 90 |
| OCT 514 | Organisation and Administration in OT | 2 | C | 30 | - |
| OCT 515 | Occupational Therapy in Mental Health | 2 | C | 30 | - |
| OCT 521 | Vocational Rehabilitation | 2 | C | 15 | 45 |
| OCT 522 | Evidence-Based Practice | 2 | C | 15 | 45 |
| OCT 523 | Clinical Work in OT II | 2 | C | - | 90 |
| OCT 524 | Special Topic Seminar | 2 | C | 15 | 45 |
| OCT 525 | Project | 4 | C | - | 135 |
| | Total | 22 | | | |

Course Contents and Learning Outcomes

100 Level

GST 111: Communication in English

(2 Units C: LH 15; PH 45)

Learning Outcomes

At the end of this course, students should be able to:

1. identify possible sound patterns in English Language;
2. list notable language skills;
3. classify word formation processes;
4. construct simple and fairly complex sentences in English;
5. apply logical and critical reasoning skills for meaningful presentations;
6. demonstrate an appreciable level of the art of public speaking and listening; and
7. write simple and technical reports.

Course Contents

Sound patterns in English Language (vowels and consonants, phonetics and phonology); English word classes (lexical and grammatical words, definitions, forms, functions, usages, collocations); Sentence in English (types: structural and functional, simple and complex); Grammar and Usage (tense, mood, modality and concord, aspects of language use in everyday life); Logical and Critical Thinking and Reasoning Methods (Logic and Syllogism, Inductive and Deductive Argument and Reasoning Methods, Analogy, Generalisation and Explanations); Ethical considerations, Copyright Rules and Infringements; Writing Activities (pre-writing, writing, post writing, editing and proofreading, brainstorming, outlining, paragraphing, types of writing, summary, essays, letter, Curriculum Vitae, report writing, note making and many others); Mechanics of writing; Comprehension Strategies (reading and types of reading, comprehension skills, 3RsQ); Information and Communication Technology in modern Language Learning; Language skills for effective communication; Major word formation processes; Writing and reading comprehension strategies; Logical and critical reasoning for meaningful presentations; Art of public speaking and listening.



GST 112: Nigerian Peoples and Culture

(2 Units C: LH 30)

Learning Outcomes

At the end of the course, students should be able to:

1. analyse the historical foundation of the Nigerian culture and arts in pre-colonial times;
2. list and identify the major linguistic groups in Nigeria;
3. explain the gradual evolution of Nigeria as a political unit;
4. analyse the concepts of Trade, Economic and Self-reliance status of the Nigerian peoples towards national development;
5. enumerate the challenges of the Nigerian State towards Nation building
6. analyse the role of the Judiciary in upholding people's fundamental rights
7. identify acceptable norms and values of the major ethnic groups in Nigeria; and
8. list and suggest possible solutions to identifiable Nigerian environmental, moral and value problems.

Course Contents

Nigerian history, culture and art up to 1800 (Yoruba, Hausa and Igbo peoples and culture, peoples and culture of the ethnic minority groups); Nigeria under colonial rule (advent of colonial rule in Nigeria, Colonial administration of Nigeria); Evolution of Nigeria as a political unit (amalgamation of Nigeria in 1914, formation of political parties in Nigeria, Nationalist movement and struggle for independence); Nigeria and challenges of nation building (military intervention in Nigerian politics, Nigerian Civil War); Concept of trade and economics of self-reliance (indigenous trade and market system, indigenous apprenticeship system among Nigeria people, trade, skill acquisition and self-reliance); Social justices and national development (law definition and classification); Judiciary and fundamental rights; Individual, norms and values (basic Nigeria norms and values, patterns of citizenship acquisition, citizenship and civic responsibilities, indigenous languages, usage and development, negative attitudes and conducts); Cultism, kidnapping and other related social vices); Re-orientation, moral and national values (The 3R's – Reconstruction, Rehabilitation and Re-orientation; Re-orientation Strategies); Operation Feed the Nation (OFN), Green Revolution, Austerity Measures, War Against Indiscipline (WAI), War Against Indiscipline and Corruption (WAIC), Mass Mobilization for Self-Reliance, Social Justice and Economic Recovery (MAMSER), National Orientation Agency (NOA); Current socio-political and cultural developments in Nigeria.

BIO 101: General Biology I

(2 Units C: LH 30)

Learning Outcomes

At the end of this course, students should be able to:

1. explain cell's structure and organisations;
2. summarise functions of cellular organelle;
3. characterise living organisms and state their general reproduction;
4. describe the interrelationship that exists between organisms;
5. discuss the concept of heredity and evolution; and
6. enumerate habitat types and their characteristics.

Course Contents

Cell structure and organisation. functions of cellular organelles. characteristics and classification of living things. chromosomes, genes their relationships and importance. General reproduction. Interrelationships of organisms (competitions, parasitism, predation, symbiosis, commensalisms,



mutualism, saprophytism). Heredity and evolution (introduction to Darwinism and Lamarckism, Mendelian laws, explanation of key genetic terms). Elements of ecology and types of habitat.

BIO 102: General Biology II

(2 Units C: LH 30)

Learning Outcomes

At the end of the lectures, students should be able to:

1. List the characteristics, methods of identification and classification of Viruses, bacteria and fungi;
2. state the unique characteristics of plant and animal kingdoms;
3. describe ecological adaptations in the plant and animal kingdoms;
4. explain nutrition, respiration, excretion and reproduction in plants and animals; and
5. describe growth and development in plants and animals.

Course Contents

Basic characteristics, identification and classification of viruses, bacteria and fungi. A generalised survey of the plant and animal kingdoms based mainly on the study of similarities and differences in the external features. Ecological adaptations. Briefs on physiology to include nutrition, respiration, circulatory systems, excretion, reproduction, growth and development.

BIO 107: General Biology Practical I

(1 Unit C: PH 45)

Learning Outcomes

At the end of the course, students should be able to:

1. outline common laboratory hazards;
2. provide precautions on laboratory hazards;
3. state the functions of the different parts of microscope;
4. use the microscope and describe its maintenance;
5. draw biological diagrams and illustrations; and
6. apply scaling and proportion to biological diagrams.

Course Contents

Common laboratory hazards: prevention and first aid. Measurements in biology. Uses and care of microscope. Compound and dissecting microscope. Biological drawings and illustration, scaling, accuracy and proportion; use of common laboratory apparatus and laboratory experiments designed to illustrate the topics covered in BIO 101.



BIO 108: General Biology Practical II

(1 Unit C: PH 45)

Learning Outcomes

At the end of the course, students should be able to:

1. describe the anatomy of flowering plants;
2. differentiate types of fruit and seeds;
3. state ways of handling and caring for biological wares;
4. describe the basic histology of animal tissues; and
5. identify various groups in the animal kingdom.

Course Contents

Anatomy of flowering plants, primary vegetative body: stem, leaf and root to show the mature tissues namely parenchyma, collenchyma, sclerenchyma, xylem and phloem. Types of fruits and seeds. Care and use of dissecting kits and other biological wares. Dissection and general histology of animal tissues based on vertebrate forms. Morphology and functions of epithelial, muscular, nervous and connective tissues. Examination of various groups of lower invertebrates under microscopes, identification of various groups of organisms in Animal Kingdom. And any experiment designed to emphasise the practical aspects of topics in BIO 102.

CHM 101: General Chemistry I

(2 Units C: LH 30)

Learning Outcomes

At the end of this course, the students should be able to:

1. define atom, molecules and chemical reactions;
2. discuss the Modern electronic theory of atoms;
3. write electronic configurations of elements on the periodic table;
4. rationalise the trends of atomic radii, ionization energies, electronegativity of the elements based on their position in the periodic table;
5. identify and balance oxidation – reduction equation and solve redox titration problems.
6. draw shapes of simple molecules and hybridized orbitals;
7. identify the characteristics of acids, bases and salts, and solve problems based on their quantitative relationship;
8. apply the principles of equilibrium to aqueous systems using Le Chatelier's principle to predict the effect of concentration, pressure and temperature changes on equilibrium mixtures;
9. analyse and perform calculations with the thermodynamic functions, enthalpy, entropy and free energy; and
10. determine rates of reactions and its dependence on concentration, time and temperature.

Course Contents

Atoms, molecules and chemical reactions. Modern electronic theory of atoms. Electronic configuration, periodicity and building up of the periodic table. Hybridization and shapes of simple molecules. Valence Forces. Structure of solids. Chemical equations and stoichiometry. Chemical bonding and intermolecular forces. Kinetic theory of matter. Elementary thermochemistry. Rates of reaction. Equilibrium and thermodynamics. Acids, bases and salts. Properties of gases. Redox reactions and introduction to electrochemistry. Radioactivity.



CHM 102: General Chemistry II

(2 Units C: LH 30)

Learning Outcomes

At the end of this course, the students should be able to:

1. state the importance and development of organic chemistry;
2. define fullerenes and its applications;
3. discuss electronic theory;
4. determine the qualitative and quantitative of structures in organic chemistry;
5. describe rules guiding nomenclature and functional group classes of organic chemistry;
6. determine rate of reaction to predict mechanisms of reactions;
7. identify classes of organic functional group with brief description of their chemistry;
8. discuss comparative chemistry of group 1A, IIA and IVA elements; and
9. describe basic properties of Transition metals.

Course Contents

Historical survey of the development and importance of Organic Chemistry. Fullerenes as fourth allotrope of carbon, uses as nanotubes, nanostructures, nanochemistry. Electronic theory in organic chemistry. Isolation and purification of organic compounds. Determination of structures of organic compounds including qualitative and quantitative analysis in organic chemistry. Nomenclature and functional group classes of organic compounds. Introductory reaction mechanism and kinetics. Stereochemistry. The chemistry of alkanes, alkenes, alkynes, alcohols, ethers, amines, alkyl halides, nitriles, aldehydes, ketones, carboxylic acids and derivatives. The Chemistry of selected metals and non-metals. Comparative chemistry of group IA, IIA and IVA elements. Introduction to transition metal chemistry.

CHM 107: General Chemistry Practical I

(1 Unit C: PH 45)

Learning Outcomes

At the end of the course the students should be able to:

1. state the general laboratory rules and safety procedures;
2. collect scientific data and correctly carrying out Chemical experiments;
3. identify the basic glassware and equipment in the laboratory;
4. state the differences between primary and secondary standards;
5. perform redox titration;
6. recording observations and measurements in the laboratory notebooks; and
7. analyse the data to arrive at scientific conclusions.

Course Contents

Laboratory experiments designed to reflect topics presented in courses CHM 101 and CHM 102. These include acid-base titrations, qualitative analysis, redox reactions, gravimetric analysis, data analysis and presentation.



CHM 108: General Chemistry Practical II

(1 Unit C: PH 45)

Learning Outcomes

At the end of this course, the students should be able to:

1. identify the general laboratory rules and safety procedures;
2. collect scientific data and correctly carrying out Chemical experiments;
3. identify the basic glassware and equipment in the laboratory;
4. identify and carry out preliminary tests which includes ignition, boiling point, melting point, test on known and unknown organic compounds;
5. perform solubility tests on known and unknown organic compounds;
6. conduct elemental tests on known and unknown compounds; and
7. conduct functional group/confirmatory test on known and unknown compounds which could be acidic / basic / neutral organic compounds.

Course Contents

Continuation of CHM 107. Additional laboratory experiments to include functional group analysis, quantitative analysis using volumetric methods.

MTH 101: Elementary Mathematics I (Algebra and Trigonometry) (2 Units C: LH 30)

Learning Outcomes

At the end of this course students should be able to:

1. explain basic definition of Set, Subset, Union, Intersection, Complements and use of Venn diagrams;
2. solve quadratic equations;
3. Solve trigonometric functions;
4. identify various types of numbers; and
5. solve some problems using Binomial theorem.

Course Contents

Elementary set theory, subsets, union, intersection, complements, venn diagrams. Real numbers, integers, rational and irrational numbers. Mathematical induction, real sequences and series. Theory of quadratic equations. Binomial theorem. Complex numbers. Algebra of complex numbers. The Argand diagram. De-Moivre's theorem, nth roots of unity. Circular measure, trigonometric functions of angles of any magnitude, addition and factor formulae.

PHY 101: General Physics I (Mechanics)

(2 Units C: LH 30)

Learning Outcomes

At the end of the course, student should be able to;

1. identify and deduce the physical quantities and their units;
2. differentiate between vectors and scalars;
3. describe and evaluate motion of systems on the basis of the fundamental laws of mechanics;
4. apply Newton's laws to describe and solve simple problems of motion;
5. evaluate work, energy, velocity, momentum, acceleration, and torque of moving or rotating objects;
6. explain and apply the principles of conservation of energy, linear and angular momentum;
7. describe the laws governing motion under gravity; and



8. explain motion under gravity and quantitatively determine behaviour of objects moving under gravity.

Course Contents

Space and time. Units and dimension, Vectors and Scalars. Differentiation of vectors: displacement, velocity and acceleration. Kinematics. Newton laws of motion (Inertial frames, Impulse, force and action at a distance, momentum conservation). Relative motion. Application of Newtonian mechanics. Equations of motion. Conservation principles in physics. Conservative forces. Conservation of linear momentum. Kinetic energy and work. Potential energy. System of particles. Centre of mass. Rotational motion: Torque, vector product, moment, rotation of coordinate axes and angular momentum. Polar coordinates. Conservation of angular momentum. Circular motion. Moments of inertia. gyroscopes and precession. Gravitation: Newton's Law of Gravitation. Kepler's Laws of Planetary Motion. Gravitational Potential Energy. Escape velocity. Satellites motion and orbits.

PHY 102: General Physics II (Electricity & Magnetism)

(2 Units C: LH 30)

Learning Outcomes

At the end of this course, the student should be able to:

1. describe the electric field and potential, and related concepts, for stationary charges;
2. calculate electrostatic properties of simple charge distributions using Coulomb's law, Gauss's law and electric potential;
3. describe and determine the magnetic field for steady and moving charges;
4. determine the magnetic properties of simple current distributions using Biot-Savart and Ampere's law;
5. describe electromagnetic induction and related concepts, and make calculations using Faraday and Lenz's laws;
6. explain the basic physical of Maxwell's equations in integral form;
7. evaluate DC circuits to determine the electrical parameters; and
8. determine the characteristics of ac voltages and currents in resistors, capacitors, and Inductors.

Course Contents

Forces in nature. Electrostatics; electric charge and its properties, methods of charging. Coulomb's law and superposition. electric field and potential. Gauss's law. Capacitance. Electric dipoles. Energy in electric fields. Conductors and insulators, current, voltage and resistance. Ohm's law and analysis of DC circuits. Magnetic fields. Lorentz force. Biot-Savart and Ampère's laws. magnetic dipoles. Dielectrics. Energy in magnetic fields. Electromotive force. Electromagnetic induction. Self and mutual inductances. Faraday and Lenz's laws. Step up and step-down transformers: Maxwell's equations. Electromagnetic oscillations and waves. AC voltages and currents applied to inductors, capacitors, resistance, and combinations.



PHY 107: General Practical Physics I

(1 Unit C: PH 45)

Learning Outcomes

At the end of the course, the student should be able to;

1. conduct measurements of some physical quantities;
2. make observations of events, collect and tabulate data;
3. identify and evaluate some common experimental errors;
4. plot and analyse graphs; and
5. draw conclusions from numerical and graphical analysis of data.

Course Contents

This introductory course emphasises quantitative measurements. The treatment of measurement errors, and graphical analysis. A variety of experimental techniques should be employed. The experiments include studies of meters, the oscilloscope, mechanical systems, electrical and mechanical resonant systems. Light. Heat. Viscosity and many others, covered in PHY 101 and PHY 102. However, emphasis should be placed on the basic physical techniques for observation, measurements, data collection, analysis and deduction.

PHY 108: General Practical Physics II

(1 Unit C: PH 45)

Learning Outcomes

At the end of this course, the student should be able to:

1. conduct measurements of some physical quantities;
2. make observations of events, collect and tabulate data;
3. identify and evaluate some common experimental errors;
4. plot and analyse graphs;
5. draw conclusions from numerical and graphical analysis of data; and
6. prepare and present practical reports.

Course Contents

This practical course is a continuation of PHY 107 and is intended to be taught during the second semester of the 100 level to cover the practical aspect of the theoretical courses that have been covered with emphasis on quantitative measurements. The treatment of measurement errors, and graphical analysis. However, emphasis should be placed on the basic physical techniques for observation, measurements, data collection, analysis and deduction.

200 Level

GST 212: Philosophy, Logic and Human Existence

(2 Units C: LH 30)

Learning Outcomes

A student who has successfully gone through this course should be able to:

1. enumerate the basic features of philosophy as an academic discipline;
2. identify the main branches of philosophy & the centrality of logic in philosophical discourse;
3. describe the elementary rules of reasoning;
4. distinguish between valid and invalid arguments;
5. think critically and assess arguments in texts, conversations and day-to-day discussions;



6. critically assesses the rationality or otherwise of human conduct under different existential conditions;
7. develop the capacity to extrapolate and deploy expertise in logic to other areas of knowledge; and
8. guide his or her actions, using the knowledge and expertise acquired in philosophy and logic.

Course Contents

Scope of philosophy; notions, meanings, branches and problems of philosophy. Logic as an indispensable tool of philosophy. Elements of syllogism, symbolic logic— the first nine rules of inference. Informal fallacies, laws of thought, nature of arguments. Valid and invalid arguments, logic of form and logic of content — deduction, induction and inferences. Creative and critical thinking. Impact of philosophy on human existence. Philosophy and politics, philosophy and human conduct, philosophy and religion, philosophy and human values, philosophy and character molding and many others.

ENT 211: Entrepreneurship and Innovation

(2 Units C: LH 30)

Learning Outcomes

At the end of this course, students should be able to:

1. explain the concepts and theories of entrepreneurship, intrapreneurship, opportunity seeking, new value creation, and risk taking;
2. state the characteristics of an entrepreneur;
3. analyse the importance of micro and small businesses in wealth creation, employment, and financial independence;
4. engage in entrepreneurial thinking;
5. identify key elements in innovation;
6. describe stages in enterprise formation, partnership and networking including business planning;
7. describe contemporary entrepreneurial issues in Nigeria, Africa and the rest of the world; and
8. state the basic principles of e-commerce.

Course Contents

Concept of Entrepreneurship (Entrepreneurship, Intrapreneurship/Corporate Entrepreneurship). Theories, Rationale and relevance of Entrepreneurship (Schumpeterian and other perspectives, Risk-Taking, Necessity and opportunity-based entrepreneurship and Creative destruction). Characteristics of Entrepreneurs (Opportunity seeker, Risk taker, Natural and Nurtured, Problem solver and change agent, Innovator and creative thinker). Entrepreneurial thinking (Critical thinking, Reflective thinking, and Creative thinking). Innovation (Concept of innovation, Dimensions of innovation, Change and innovation, Knowledge and innovation). Enterprise formation. Partnership and networking (Basics of Business Plan, Forms of business ownership, Business registration and Forming alliances and joint ventures). Contemporary Entrepreneurship Issues (Knowledge, Skills and Technology, Intellectual property, Virtual office, Networking). Entrepreneurship in Nigeria (Biography of inspirational Entrepreneurs, Youth and women entrepreneurship, Entrepreneurship support institutions, Youth enterprise networks and Environmental and cultural barriers to entrepreneurship). Basic principles of e-commerce.

ANA 201: Anatomy of Upper & Lower Limbs

(3 Units C: LH 30; PH 45)



Learning Outcomes

At the end of this course, students should be able to:

1. define fundamental anatomical terminology and discuss the anatomical position;
2. describe the anatomy of the musculoskeletal system, including the axial skeleton; appendicular skeleton, appendicular and axial muscles, and arthrology;
3. describe the general features of the bones of the upper and lower limbs;
4. identify the major muscles of the upper and lower limbs;
5. explain the types and structure of the joints of the upper and lower limbs;
6. correlate between the attachment of the muscles and their functions on the different joints;
7. identify the major nerves of the upper and lower limbs;
8. describe the functional components of each of the major nerves and its distribution;
9. identify and describe the course of the major superficial veins of the upper and lower limbs; and
10. name the major arteries of the upper and lower limbs.

Course Contents

Descriptive terms, plans and terms of relationship of the human body, terms of comparison, attachment of muscles, types of muscles, movements of joints. Osteology, principles of kinesiology, general organisation of body system. Cutaneous innervation of the upper limb; pectoral region; breast; axilla; shoulder region; arm and cubital fossa; flexor compartment of forearm; extensor compartment of forearm; hand; venous and lymphatic drainage of the upper limb. Applied anatomy of nerves; blood supply of the upper limb. Cutaneous innervation of the lower limb; femoral triangle; adductor canal and medial side of the thigh; gluteal region; back of the thigh, popliteal fossa; extensor compartment of the leg and dorsum of the foot; peroneal and flexor compartment of the leg; sole of the foot, arches of the foot; mechanism of walking; venous and lymphatic drainage of the lower limb; applied anatomy of the nerves and blood supply to the lower limb.

ANA 203: General and Systemic Embryology

(2 Units C: LH 30)

Learning Outcomes

At the end of this course, students should be able to:

1. explain how the embryo forms from the zygote;
2. discuss the role of cleavage and gastrulation in animal development;
3. demonstrate; understanding of embryology and significance of prenatal diagnostic methods;
4. describe structural features of primordia in tissue and organs at different developmental stages;
5. define risk periods in histo- and organogenesis; and
6. analyse the most often observed developmental anomalies.



Course Contents

Spermatogenesis, oogenesis; ovarian follicles; ovulation; corpus luteum; menstruation; uterine cycle; hormonal control of uterine cycle; fertilisation; cleavage; implantation; reproductive technologies-IVF/surrogacy/embryo transfer; embryo manipulation & potency/twinning; molecular embryology and transgenesis; gastrulation; notochord, neurulation; derivatives of the germ layers; folding of the embryo; fetal membranes; placenta; development of limbs and teratology. Growth and perinatology; congenital malformations – general introduction. The cardiovascular system, skin, structure of the nails and hair. Macrophagic system; cellular immunology; lymphoid organs; glands – endocrine and exocrine. Respiratory system. Digestive system. Urinary and genital systems. Electron micrograph studies of each organ.

BCH 201: General Biochemistry I

(2 Units C: LH 30)

Learning Outcomes

At the end of the lectures, students should be able to:

1. explain the structure of different macromolecules in biological system;
2. identify types of chemical reactions involving these macromolecules;
3. explain the various methods of isolation of these macromolecules;
4. estimate the effects of acids and alkalis on the macromolecules;
5. describe purification of macromolecules; and
6. discuss quantification of the various macromolecules.

Course Contents

Introductory chemistry of amino acids, their properties, reactions and biological functions. Classification of amino acids: neutral, basic and acidic; polar and non-polar; essential and non-essential amino acids. Peptides. Introductory chemistry and classification of proteins. Biological functions of proteins. Methods of their isolation, purification and identification. Primary, secondary, tertiary and quaternary structures of proteins. Basic principles of tests for proteins and amino acids. Introductory chemistry of carbohydrates, lipids and nucleic acids. Nomenclature of nucleosides and nucleotides, effects of acid and alkali on hydrolysis of nucleic acids.

BCH 203: General Biochemistry Practical I

(1 Unit C: PH 45)

Learning Outcomes

At the end of this course students should be able to:

1. describe the laboratory experiments designed to reflect the topics covered; and
2. discuss the laboratory procedures used in the study of various biochemical processes.

Course Contents

Laboratory experiments designed to reflect the topics covered in BCH 201 and BCH 202. Introduction to laboratory methods and procedures employed in studying biochemical processes.



PIO 201 Introductory Physiology and Blood

(2 Units C: LH 30)

Learning Outcomes

At the end of this course, students should be able to:

1. describe the composition of a cell membrane;
2. explain how a potential difference across a membrane will influence the distribution of a cation and an anion;
3. describe how transport rates of certain molecules and ions are accelerated by specific membrane transport proteins;
4. distinguish between active (primary and secondary) transport, facilitated diffusion, and passive diffusion based on energy source and carrier protein involvement;
5. identify the mechanisms and role of selective transporters for amino acids, neurotransmitters, nutrients, etc.;
6. explain the general concepts of homeostasis and the principles of positive and negative feedback in physiological systems;
7. identify the site of erythropoietin production, the stimulus for its release, and the target tissue for erythropoietin action;
8. discuss the normal balance of red blood cell synthesis and destruction, including how imbalances in each lead to anemia or polycythemia;
9. list and differentiate the various types of leukocytes;
10. describe the role of thrombocytes in haemostasis; and
11. list clotting factors and the discuss the mechanism of anti-coagulants.

Course Contents

Introduction and history of physiology. Structure and functions of cell membranes. Transport process. Special transport mechanism in amphibian bladder, kidney, gall bladder, intestine, astrocytes and exocrine glands. Biophysical principles. Homeostasis and control systems including temperature regulation. Biological rhythms. Composition and functions of blood. Haemopoiesis. WBC and differential count. Plasma proteins Coagulation, fibrinolysis and platelet functions. Blood groups – ABO system – Rh system. Blood transfusion – indication for collection and storage of blood, hazards of blood transfusions. Reticulo- endothelial system. Immunity and immunodeficiency disease and HIV.

PIO 203: Physiology of Excitable Tissues

(2 Units C: LH 30)

Learning Outcomes

At the end of this course students should be able to:

1. list the steps in excitation-contraction coupling in skeletal muscle;
2. describe the structure of the neuromuscular junction;
3. list some intracellular factors that can cause muscle fatigue;
4. describe the distinguishing characteristics of multi-unit and unitary smooth muscles; and
5. explain the steps in the excitation-contraction coupling mechanism in cardiac muscle and compare with skeletal muscle including different mechanisms for sarcoplasmic reticulum calcium release.



Course Contents

Structure and functions of nerves. Cardiac muscle, smooth muscle and skeletal muscle. Muscles: structure, excitation, theories of excitation-contraction. Membrane potentials. Nerve impulse and its physiological properties.

PIO 218: Introduction to Laboratory Physiology 1

(1 Unit C: LH 30)

Learning Outcomes

At the end of this course, students should be able to:

1. demonstrate proper handling of laboratory equipment;
2. dissect laboratory animals and mount an isolated organs for a specific experiment;
3. use human subjects for some of the experiments like blood grouping, and many others; and
4. take recordings of an experiment and interpret the results accordingly.

Course Contents

Laboratory sessions on basic physiology experiments, especially those related to the frog sciatic nerve, smooth muscles and blood physiology.

300 Level

GST 312: Peace and Conflict Resolution

(2 Units C: LH 30)

Learning Outcomes

At the end of the course, students should be able to:

1. analyse the concepts of peace, conflict and security;
2. list major forms, types and root causes of conflict and violence;
3. differentiate between conflict and terrorism;
4. enumerate security and peace building strategies; and
5. describe roles of international organisations, media and traditional institutions in peace building.

Course Contents

Concepts of Peace, Conflict and Security in a multi-ethnic nation. Types and Theories of Conflicts: Ethnic, Religious, Economic, Geo-political Conflicts. Structural Conflict Theory. Realist Theory of Conflict. Frustration-Aggression Conflict Theory. Root causes of Conflict and Violence in Africa. Indigene and settlers' phenomenon. Boundaries/border disputes. Political disputes. Ethnic disputes and rivalries. Economic Inequalities. Social disputes. Nationalist Movements and Agitations. Selected Conflict Case Studies – Tiv-Junkun; Zango Kartaf, Chieftaincy and Land disputes and many others. Peace Building, Management of Conflicts and Security: Peace & Human Development; Approaches to Peace & Conflict Management (Religious, Government, Community Leaders and many others). Elements of Peace Studies and Conflict Resolution: Conflict dynamics assessment Scales. Constructive & Destructive Justice and Legal framework: Concepts of Social Justice. The Nigeria Legal System. Insurgency and Terrorism. Peace Mediation and Peace Keeping. Peace & Security Council (International, National and Local levels). Agents of Conflict resolution – Conventions, Treaties. Community Policing: Evolution and Imperatives. Alternative Dispute Resolution (ADR); a.) Dialogue, b.) Arbitration, c.) Negotiation, d.) Collaboration and many others. Roles of International Organisations in Conflict Resolution a.) The United Nations (UN) and its Conflict Resolution Organs. b.) The African Union & Peace Security Council c.).



ECOWAS in Peace Keeping. Media and Traditional Institutions in Peace Building. Managing Post-Conflict Situations/Crisis: Refugees; Internally Displaced Persons (IDPs). The role of NGOs in Post-Conflict Situations/Crisis.

ENT 312: Venture Creation

(2 Units C: LH 15; PH 45)

Learning Outcomes

At the end of this course, students, through case study and practical approaches, should be able to:

1. describe the key steps in venture creation;
2. spot opportunities in problems and in high potential sectors regardless of geographical location;
3. state how original products, ideas, and concepts are developed;
4. develop business concept for further incubation or pitching for funding;
5. identify key sources of entrepreneurial finance;
6. implement the requirements for establishing and managing micro and small enterprises;
7. conduct entrepreneurial marketing and e-commerce;
8. apply a wide variety of emerging technological solutions to entrepreneurship; and
9. appreciate why ventures fail due to lack of planning and poor implementation.

Course Contents

Opportunity Identification (Sources of business opportunities in Nigeria, Environmental scanning, Demand and supply gap/unmet needs/market gaps/Market Research, Unutilised resources, Social and climate conditions and Technology adoption gap); New business development (business planning, market research). Entrepreneurial Finance (Venture capital, Equity finance, Micro finance, Personal savings, Small business investment organisations and Business plan competition). Entrepreneurial marketing and e-commerce (Principles of marketing, Customer Acquisition & Retention, B2B, C2C and B2C models of e-commerce, First Mover Advantage, E-commerce business models and Successful E-Commerce Companies). Small Business Management/Family Business: Leadership & Management, Basic book keeping, Nature of family business and Family Business Growth Model. Negotiation and Business communication (Strategy and tactics of negotiation/bargaining, Traditional and modern business communication methods). Opportunity Discovery Demonstrations (Business idea generation presentations, Business idea Contest, Brainstorming sessions, Idea pitching). Technological Solutions (The Concept of Market/Customer Solution, Customer Solution and Emerging Technologies, Business Applications of New Technologies - Artificial Intelligence (AI), Virtual/Mixed Reality (VR), Internet of Things (IoTs), Blockchain, Cloud Computing, Renewable Energy and many others, Digital Business and E-Commerce Strategies).



BCH 304: Metabolism of Amino Acids & Proteins

(2 Units C: LH 30)

Learning Outcomes

At the end of the course, students should be able to:

1. illustrate why and how proteins are broken in cellular systems;
2. explain how to determine the molecular weight of proteins;
3. recognise the relationship between the urea cycle and other pathways of protein metabolism.
4. describe the differences between ketogenic and glucogenic amino acids;
5. identify the role of inorganic nitrogen in protein synthesis and breakdown.

Course Contents

Amino acids as building blocks of proteins; the peptide bond as covalent backbone of proteins. Forces involved in the stabilisation of protein structure. Protein isolation, fractionation, purification and characterisation. Amino acid analysis of peptides and proteins. Methods for the determination of the sequence of amino acids in proteins. Protein Biosynthesis, Molecular weight determination of proteins. Techniques in protein biochemistry. Oxidative degradation of amino acids and metabolism of one carbon units. Ammonia toxicity and urea formation. Ketogenic and Glucogenic amino acids. Biosynthesis of amino acids and some derivatives; the urea cycle; metabolism of inorganic nitrogen. Disorders of amino acid metabolism, Polyamines.

OCT 311: Introduction to Occupational Therapy & Basic Procedures for Rehabilitation Professionals and Ethics (2 Units C: LH 30)

Learning Outcomes

At the end of the course, students should be able to:

1. describe OT as a profession within the Nigerian health care system and the specific role, history and of OT, teamwork and multidisciplinary interaction;
2. outline the philosophy, scope, fields and sectors of practice of OT;
3. explain professional etiquette, ethics, legal responsibilities, rules of conduct of OT;
4. explain the regulatory role of MRTBN and OT professional association, its role and responsibilities;
5. discuss the OT process and practice framework utilised in OT;
6. discuss the fundamentals of client handling and professional and therapeutic relationships, counselling and clinical reasoning; and
7. describe the central concept of occupation in OT.

Course Contents

Definition of Occupational Therapy. Historical perspective, philosophy, knowledge, skills reflective of past, current and future practice. Introduction to occupational therapy theoretical foundations, frames of reference, and practical models. The nature of theory and practice as it relates to scope of practice, ethics, human rights, and legal issues. Role of the Occupational Therapist and the Occupational Therapy Assistant. Local, national, and international associations and accreditation bodies. Trends in healthcare, models of practice including wellness and health promotion. Teamwork and multidisciplinary interaction. Steps in the OT process and health practice models as applicable to all fields of practice. Fundamentals of client handling and professional and therapeutic relationships. Counselling and clinical reasoning.

OCT 312: Occupational Therapy Theory and Practice

(2 Units C: LH 30)



Learning Outcomes

At the end of this course, students should be able to:

1. describe the foundations of occupational therapy and explain various theories and frames of references of Occupational therapy;
2. analyse, synthesise, and apply models of occupational performance;
3. apply theories that underlie the practice of occupational therapy;
4. use theories, models of practice, and frames of reference to guide and inform evaluation and intervention;
5. analyse and discuss how occupational therapy history, occupational therapy theory, and the sociopolitical climate influence practice;
6. compare and contrast models of practice and frames of reference that are used in occupational therapy;
7. apply theoretical constructs to evaluation and intervention with various types of clients in a variety of practice contexts and environments to analyze and effect meaningful occupation outcomes;
8. discuss the process of theory development and its importance to occupational therapy;
9. utilise national and international resources in making assessment or intervention choices; and
10. appreciate the influence of international occupational therapy contributions to education, research, and practice.

Course Contents

Major models of practice in occupational therapy that guide practice. Exploration of how theory supports these models as guides to evaluation and intervention decisions. Occupational therapy theory development. Importance of theory in clinical decision making. Developing a strong occupational therapy professional identity. Theoretical perspectives commonly used in occupational therapy practice with a focus on the occupation-based models. Comparison and contrast of theoretical perspectives and their application to occupational therapy assessment and treatment planning for clients with a variety of occupational needs. Knowledge and skills necessary for the assessments of patients leading to identification of occupational dysfunction. Theory and techniques for measuring physical and physiological entities such as vital signs, strength, muscle tone, joint range of motion, respiratory capacity, circulatory status, pain, balance, posture, gait, and coordination. Importance of precision of measurement, elimination of errors in testing, validity and reliability, and accurate documentation. Critical review of models and outcome measures used by Occupational therapists with a focus on reliability, validity, specificity and sensitivity of the tests. The educational experiences in this course will be designed to progress from normal to pathological across the spectra of age, gender, and race. The relevance and application of functional outcome research in clinical practice will be discussed. The process and principle of producing and keeping records of OT referral, assessment, intervention, and outcomes will be discussed.



OCT 313: Pathology for Occupational Therapy

(2 Units C: LH 30)

Learning Outcomes

At the end of the course, students should be able to:

1. demonstrate general understanding of basic pathology and microbiology of common disease that occupational therapists will encounter in their practice;
2. describe the limitations imposed by pathology on the functioning of the individual; and
3. discuss the pathology of disease and infections in human body.

Course Contents

Definition of pathology. Diseases and relevant terms used in pathology. Causes and classification of diseases. Cell damage and its sequel. Inflammation, function and type. Acute inflammation: features, causes, vascular and cellular events. Chronic inflammation: causes, types, classification. Repair, wound healing by primary and secondary union, factors promoting and delaying the process. Infection and body's defence against it. Cross infection and its control. Some important bacterial, fungal and viral infections including tuberculosis. Hypertrophy, dysplasia and dystrophy. Tumours, their aetiology, types, classifications and characteristics. Cysts, their formation and classification. Developmental anomalies or disturbances. Effects of ionising radiation on human tissues. Trauma, wounds, fractures, dislocations and bleeding. Systems' pathology: Disorders of blood- RBCs, WBCs and thrombocytes. Disorders of circulations, the heart, and respiratory system. Diseases of the gastro-intestinal tract. Disorders of bones and joints. Disorders of blood: Constituents of blood and bone marrow. Regulation of hematopoiesis. Anaemia: Classification, clinical features & laboratory diagnosis. Hemodynamic disorders: Thrombo-embolic disease & shock, Ischemic, necrosis, thrombosis, embolism, Infarction, shock'. Gangrene, Thromboangitis obliterans. Neoplasia – definition, classification, biological behaviour. Benign and malignant carcinoma and sarcoma and principles of their spread. Hypersensitivity diseases and immunity: brief overview of hypersensitivity reaction, allergies and auto immune diseases. Genetic disorders: brief overview of genetic diseases. Neurovascular diseases: i. Outline of cerebro-vascular disorders. ii. Trauma to the brain and spinal cord. iii. Demyelinating diseases like multiple sclerosis. iv. Degenerative diseases like Parkinson's disease. v. Peripheral vascular disease vi. Poliomyelitis. Metabolic disorders – diabetis mellitus- types, pathogenesis, pathology, and laboratory diagnosis.

OCT 314: Pharmacology for Occupational Therapy

(2 Units C: LH 30)

Learning Outcomes

At the end of the course, students should be able to:

1. describe pharmacology of drugs used in major systemic disorder;
2. develop a basic appreciation of important pharmacological terms, discuss the various systems of classification and naming of drugs, and develop an understanding of how drugs are regulated;
3. discuss basic pharmacodynamic concepts, including familiarity with drug-receptor interactions and dose-response relationships;
4. explain the important terms used in pharmacokinetics, describe the events that occur from the time of drug entry into the body to drug exit from the body, and understand factors that influence drug pharmacokinetics;
5. develop a basic appreciation of the routes of drug administration and various forms of drug preparations;



6. describe the systems and processes used in the prescribing (including meaning and use of common abbreviations), dispensing and administration of medication;
7. develop an appreciation for the occupational health issues in handling of medications and medication management plans;
8. explain implication of drug in relation to treatment program; and
9. critically appraise the role of the occupational therapist in medication management as a health maintenance activity and in monitoring the impact of drug therapy on the therapeutic process.

Course Contents

Pharmacokinetics, side effects and drug interactions of medications prescribed to clients who are commonly referred for occupational therapy services. Role of the occupational therapist in medication management as a health maintenance activity and in monitoring the impact of drug therapy on the therapeutic process and occupational performance of clients. History of pharmacology and its development; Introduction to pharmacokinetics, drug absorption and bioavailability. Drug metabolism and pharmaco-genetics. Effects of disease on drug kinetics. Drug in pregnancy and the extreme age. Pharmacodynamics: dose-response relationships, LD₅₀, ED₅₀ and TD₅₀; Therapeutic index. Introduction of new drugs; Clinical trials. Adverse drug reactions and adverse reaction surveillance. Routes of drug administration. Basic principles of pharmacokinetics. Absorption, distribution and biotransformation of drugs. Drug reception interactions. Non-Steroidal Anti-inflammatory Drugs (NSAID). Muscle relaxants, sedatives and analgesic agents, Anti-hypertensive drugs, Bronchodilators and many others.

COS 201: Programming for Rehabilitation Professionals (2 Units C: LH 15; PH 45)

Learning Outcomes

At the end of the course, students should be able to:

1. use the basic AutoCad commands;
2. create images/figures in AutoCad;
3. edit, save, drawing, annotate, plot, customise in AutoCad; and
4. discuss the principles guiding CAD/CAM technology in socket making and also making of different kinds of orthosis and prosthesis.

Course Contents

Basics of CAD: introduction, definition, history, current status, product cycle. Automation, designing, application and benefits. Computer Graphics: Introduction of software. Function of graphic package. Application Software. AutoCad 2010 and updated version: introduction, foundation of AutoCad Commands. Execution of simple 2D Drawings. Understanding 3D commands. Executing 3D Commands. Creating 3D objects. Rendering and Image attached to an object. Starting new projects. Creating, editing, and saving drawings. Annotation. Dimension. Plotting Customization. Auto Lisp. Introduction to CNC. History of CNC. Advantages and disadvantages of N/C, CNC, DNC. Major parts of CNC. Basics of CAM. Introduction of CNC machine. Basics of Computer Aided Designing and Manufacturing (CAD/CAM) and its use in Prosthetic & Orthotics (P & O). Other kinds of computers used in P & O. CAD/CAM Technology in socket making and making of different kinds of orthosis and prosthesis. CAD/CAM in P & O: types of digitizers used, concept of different types of modifying software. CNC carver and its specification. Step wise fabrication procedure of sockets, shells and spinal orthoses and its advantages and disadvantages



Learning Outcomes:

At the end of this course, students should be able to:

1. demonstrate knowledge and understanding of human development through the lifespan;
2. demonstrate knowledge and appreciation for the role of sociocultural, socioeconomic, and diversity factors and lifestyle choices in the development of young children;
3. relate the concepts of traditional developmental theorists to the health care of children;
4. describe typical development of occupational behaviours during the periods of infancy, pre-school, and school age, and explain the influences of family, and cultural and society context on occupational performance;
5. demonstrate beginning skills in observation and interpretation of objective behaviours relative to motor, perceptual-motor, cognitive, psychological, and social development, and within the sociocultural environment of that child;
6. develop initial skills to observe developmental milestones, and describe its influence of on occupational skill development;
7. observe the development behaviours of a typical child. Prepare clear and accurate written documentation describing a child's current developmental performance;
8. identify common problems that may lead to an interruption in occupational skills development such as health and environmental issues, and developmental delay. discuss methods of prevention and the promotion of children's health;
9. demonstrate objectivity in documentation and professional work behaviors through participation in the laboratory activities and execution of course assignments;
10. demonstrate ability to critically review articles developmental research by preparing a review and taking part in a discussion of the implications of research in health care;
11. demonstrate knowledge and appreciation of the role of sociocultural, socioeconomic, and diversity factors and lifestyle choices in contemporary society;
12. demonstrate an understanding of the ethical and practical considerations that affect the health and wellness needs of adolescents, adults and older adults who are at risk for occupational deprivation;
13. describe common social, occupational and health challenges associated with the stages of adolescent, adult and older adults' development, and the problems that may lead to an interruption in occupational skills development;
14. discuss methods of prevention and the promotion of health; and
15. describe impact of occupational role at various stages of adolescent, adult and older adult development, including the sequential and/or cyclical changes in occupational role.



Course Contents

1. Paediatrics: Human growth and development in infancy, childhood, and adolescence in the areas of sensory, motor, physiological, cognitive, psychosocial, and self-care skills. Principles of health promotion and disability prevention and influences of culture and diversity. Examination of the role of age-related occupations on development and within the framework of performance components, performance areas and contexts. Observation and participation in community service and learning settings. Understanding the meaning and cultural influence of occupation, reasons for performing occupation, occupational justice and injustice, therapeutic use of occupations, and occupational right in childhood and adolescence.

2. Adult: Human development for adulthood and elders, with an analysis and integration of normal growth and development in the areas of sensory, motor, perceptual, physical, cognitive, physiological, psychosocial and self-care skills. Principles of health promotion and disease prevention and influences of culture and diversity. Examination of the role of age-related occupations on maturity, aging, death and dying, quality of life and well-being. Study of performance components, performance areas and contexts. observation/participation in community service setting. Understanding the meaning and cultural influence of occupation, reasons for performing occupation, concepts of occupational justice and injustice, therapeutic use of occupations, and occupational right in adults.

OCT 323: Therapeutic Skills and Activity Analysis

(2 Units C: LH 30)

Learning Outcomes

At the end of the course, students should be able to:

1. list the therapeutic values of activities to be applied in clinical situations;
2. identify and describe principles in graded and selected activities for specific group of clients according to the goals and needs;
3. evaluate the effectiveness of the activities base on achievement towards the aims of the treatment; and
4. analyse the values of activity from the therapists' point of views.

Course Contents

Development of competence in the identification, implementation and documentation of therapeutic activities utilised across clinical settings to prepare a client to participate in occupations. Hands-on experience with physical agent modalities, orthosis and prothesis, wound care and therapeutic exercise as well as therapeutic mediums. Active engagement in a variety of activities across the lifespan to master the activity analysis and group dynamics which serve as a foundational skill to all areas of occupational therapy practice. This course will help the student build a firm foundation for the critical analysis of the power of occupation as it relates to health and well-being. Exploration of the real and symbolic meanings of activities and objects in a variety of contexts will be explored as students examine a variety of activities including Occupations (ADL, IADL, Rest & Sleep, Work, Social Participation, Play, Leisure, Education), competitive and non-competitive games, hobbies, crafts, mindfulness activities, expressive arts and media, as well as the tools and objects that are used for each of these.



OCT 324: Kinesiology

(2 Units C: LH 30)

Learning Outcomes

At the end of this course students should be able to:

1. define and describe basic kinesiological concepts (such as planes/axes of movement, types of joint movements, levers, how muscles function, and many others);
2. identify the major muscles of the body and explain their primary contributions to movement;
3. acquire basic knowledge of how a goniometer is utilized to measure joint angles;
4. define and describe basic concepts and terminology relating to posture, balance, lifting, reaching, grasping and walking;
5. analyse an individual's performance of a given activity as evidenced by correctly;
6. describe the movement(s) occurring at joints throughout the body;
7. describe the types of muscle contractions occurring during movement;
8. identify the muscular agonist(s), antagonist(s) and synergist(s) contributing to the movement;
9. analyse a given activity as evidenced by correctly;
10. identify the movement(s) necessary to perform the activity;
11. describe the types of muscle contractions necessary to perform the activity;
12. identify the muscular agonist(s), antagonist(s) and synergist(s) necessary to perform the activity; and
13. compare and contrast "normal" human movement to "abnormal" movement caused by selected pathological conditions.

Course Contents

Review of muscle attachments and muscle action. Nerve supply and neurological control of movements. Location of the centres of gravity of the body. Biomechanics of human motion. Fundamental starting positions/postures. Resolution of forces. Roles of muscle action. Types of body movement and uses. Introduction to electromyography studies. Analyses of normal and abnormal human locomotion; Analysis of motor skills.

400 Level

OCT 411: Neuroscience for Occupational Therapy

(2 Units C: LH 30)

Learning Outcomes

At the end of the course, students should be able to:

1. interpret and identify neurological signs and symptoms, and the clinical stages of disease course applied to a neurological condition and the impact on occupational performance;
2. demonstrate advanced clinical reasoning using OT process and OT models, and neurological and OT frames of reference in the selection and provision of OT assessment and intervention of people with neurological conditions;
3. analyse the impact of acute, chronic and degenerative neurological conditions on individuals and their families;
4. design and implement appropriate performance goals and therapeutic interventions that are based on evidence-based practice and inter-professional approaches for individuals with neurological conditions to restore or adapt occupational performance; and
5. communicate and document neurological assessment and interventions to monitor and evaluate occupational performance across acute, rehabilitation and community settings, and in collaboration with relevant stakeholders.



Course Contents

Basic concepts of Neuroanatomy. Constraint Induced Movement Therapy. Evaluation and assessment of neurological conditions. Principles of Neuroplasticity. Assessment and treatment of clients with neurological deficits. Overview of Stroke. Assessment of the upper extremity function such as functional reach and hand function (in details). Assessment of hemiplegic shoulder. Assessment covering: Positioning and posture, Muscle action and range of motion, Control of movement, Sensation- sharp/dull, light touch, touch localization, temperature, 2-point discrimination, monofilaments, stereognosis, proprioception, kinaesthesia, sensation mapping. Evaluation procedures for performance of skills including: ROM, muscle strength, muscle tone, coordination, control of movement, sensation (cutaneous and cortical), trunk control, cognitive perceptual functions, gait, ADL (activities of daily living). Assessment of functional abilities. Special tests in neurology. Special tests for nerve compression, contractures and deformities. Pain assessment. Outcome measures used in neurological rehabilitation for ADL. Cognitive assessment tests. Visual assessment and test of visual perceptual skills. Overview of the following approaches: Biomechanical, Roods, NDT–Bobath for adults, Movement Therapy, Brunnstrom Approach, Proprioceptive neuromuscular facilitation. Motor relearning theory and problem-oriented approach, Rehabilitative approach and Affolter's approach. Task oriented approach.

OCT 412: Assistive Technology, Prosthetics, and Orthotics (2 Units C: LH 15; PH 45)

Learning Outcomes

At the end of the course, students should be able to:

1. describe the goals of splinting;
2. explain classification of hand splints and their application to treatment;
3. identify splint types and materials used for fabricating them;
4. demonstrate and apply the principles of hand splinting process for preparing splints;
5. outline how to conduct assistive technology evaluations and consultations, designing, fabricating, modifying, customizing, and maintaining devices; and AT service coordination;
6. differentiate among assistive devices, adaptive equipment, computer hardware/software, and other electronic devices that support participation of people with a range of disabilities; and
7. fabricate and/or adapt the tools of everyday living to support therapeutic.

Course Contents

Appraisal of the different assistive devices: techniques, methods of fabrication and application of these devices. Different types of orthotic and prosthetic devices for correcting or assisting specific problems. Wheelchair seating and assessment. Specific measurement considerations for wheelchair seating. Wheelchair prescriptions including adaptations. Electro-mechanical mobility aids and motorised wheelchairs. Adaptive devices and assistive technology including reachers, mouse and keyboard adaptations, and mobility impairment aid. Care, uses and prescription of wheelchairs and other assistive devices for activities of daily living such as crutches, walking frames and sticks. Bio-mechanical principles in giving prosthesis and orthosis and the criteria for selection. Patient's education on care, maintenance and uses of orthosis and prosthesis. Dangers, complications and contraindications in the use of the different assistive/corrective devices. Hand Splinting: Occupational therapy in the rehabilitation of the amputee. Spinal Orthoses: Principles, goals, classification, specification in application, indications and contraindications; Demonstration of methods of training in the use of spinal orthoses. Practical Work: Mobile arm supports and slings. Basic principles in application of Biofeedback and FES and as adjunct to therapy.



Environmental control units: writing, feeding, and toileting aids. Prescribing and designing footwear modifications. Occupation-based activities for a range of clients' needs.

OCT 413: Introduction to Clinical Work in OT I

(2 Units C: PH 90)

Learning Outcomes

At the end of this course, students should be able to:

1. demonstrate entry-level knowledge and skills necessary for the assessments of patients to identify occupational dysfunction;
2. apply the theory and techniques for measuring occupational performance as well as physical and physiological entities such as vital signs, strength, muscle tone, joint range of motion, respiratory capacity, circulatory status, pain, balance, posture, gait, and coordination;
3. critically review models and outcome measures used by occupational therapists for different client groups with a focus on reliability, validity, specificity and sensitivity of the tests; and
4. discuss the relevance and application of functional outcomes in research in clinical practice.

Course Contents

Hands-on assessment, treatment planning, and client intervention. Learning to be part of the therapy team and professionally interacting with clients and healthcare providers. Translation of professional behaviour, observation skills, performance skills, and clinical application of knowledge into a clinical setting.

OCT 414: Physical Dysfunction and Rehabilitation I

(2 Units C: LH 30)

Learning Outcomes

At the end of this course, students should be able to:

1. discuss the aetiology, pathology, signs and symptoms, treatment and prognosis of common physical conditions, and disease processes;
2. synthesise Occupational Therapy perspective with knowledge of medical, and physical conditions in adolescents, adults and geriatrics;
3. explain the effects of acute and chronic disability on occupational performance in the context of adult rehabilitation;
4. evaluate and treat adults with orthopaedic rehabilitative needs should be emphasized;
5. discuss the theoretical frames of reference and the various intervention approaches; and
6. explain the techniques and strategies for enhancing functional performance.

Course Contents

Dynamic splinting. Teaching activities in Occupational Therapy. Evaluation of sensation and intervention for sensory deficits. Evaluation of performance skills. Burns and burns rehabilitation. Common assessment tools for physical dysfunction. Physical agent modalities.



OCT 415: Occupational Therapy in Paediatrics I

(2 Units C: LH 30)

Learning Outcomes

At the end of this course, students should be able to:

1. outline the aetiology, pathology, signs and symptoms, treatment and prognosis of conditions/diseases processes in paediatrics;
2. use standardised and non-standardized screening tools to determine the need for occupational therapy intervention from infancy through adolescence;
3. discuss the influence of culture, diversity, environmental context, impact of occupation and health promotion/disease prevention;
4. describe developmental milestones, motor control, neonatal reflexes, and role of reflexes in movement development; and
5. select appropriate assessment tools including outcomes based on the needs of the child.

Course Contents

Feeding and oral motor assessment in paediatrics. Developmental milestone assessment. Fine motor and handwriting assessment. Visual perceptual and low vision assessment. Behaviour assessment in paediatrics. Assistive devices for paediatrics. Intervention for challenging behaviours. Play assessment. Overview of motor control and motor learning. Sensory integration and praxis test. Sensory profile. Introduction to sensory training. Overview of Bobath NDT, Rood's neuromuscular facilitation, Ayre's Sensory Integration Approach; Biomechanical frame of reference. Behaviour modification. Peto's - conductive Education. Special Education. Principles of education for perceptual and cognitive training. Assessment of developmental coordination disorder. Overview of Neurological disorders: CNS malformations, CNS infection and inflammatory diseases in childhood. Head injury in childhood. CNS tumours in childhood. CVD in childhood. Neurocutaneous syndromes. Spinocerebellar degeneration. Neural tube defects. Poliomyelitis. Chromosomal disorders. Muscle disorders in childhood. School function assessment. WeeFim and other ADL assessments for paediatrics. Gross Motor and function assessment. Social functioning and participation. Overview of sickle cell disease. Introduction to school-based occupational therapy practice – handwriting, behavioural and social skills, transition planning; inclusive education, special needs schools, and the twin-track approach to educating children with disabilities.

OCT 421: Neuro-Rehabilitation for Occupational Therapy

(2 Units C: LH 30)

Learning Outcomes

At the end of this course, students should be able to:

1. interpret and identify neurological signs and symptoms, and the clinical stages of disease course applied to a neurological condition and the impact on occupational performance;
2. demonstrate advanced clinical reasoning using OT process and OT models, and neurological and OT frames of reference in the selection and provision of OT assessment and intervention of people with neurological conditions;
3. analyse the impact of acute, chronic and degenerative neurological conditions on individuals and their families;
4. design and implement appropriate performance goals and therapeutic interventions that are based on evidence-based practice and inter-professional approaches for individuals with neurological conditions to restore or adapt occupational performance; and



5. communicate and document neurological assessment and interventions to monitor and evaluate occupational performance across acute, rehabilitation and community settings, and in collaboration with relevant stakeholders.

Course Contents

Overview of Stroke. Overview of neuro-degenerative conditions. Occupational therapy interventions for specific neurological conditions: Cerebrovascular accident, Spinal Cord Injury, Parkinson's disease, Multiple Sclerosis, Gullian Barre Syndrome, Amyotrophic Lateral Sclerosis, Traumatic Brain Injury, Cerebellar ataxia, Intra cranial tumours, Diabetic Neuropathy, and Myasthenia gravis and many others. Application of occupational therapy principles and techniques in the evaluation and treatment of specific neurological conditions: Cerebrovascular accident, Spinal Cord Injury, Parkinson's disease, Multiple Sclerosis, Gullian Barre Syndrome, Amyotrophic Lateral Sclerosis, Traumatic Brain Injury, Cerebellar ataxia, Intra cranial tumours, Diabetic Neuropathy, Myasthenia gravis and many others. Discharge planning. Brief discussion of return-to-work evaluation and work capacity assessments in relation to neurological conditions. Case study and problem-based learning. Driving and community mobility for people with neurological conditions.

OCT 422: Physical Dysfunction and Rehabilitation II

(2 Units C: LH 30)

Learning Outcomes

At the end of this course, students should be able to:

1. explain the importance of balancing areas of occupation to the achievement of health and wellness;
2. discuss the effects of heritable diseases, genetic conditions, disability, trauma and injury to the physical health and occupational performance of the individual;
3. develop a holistic, client- and occupation-centred health promotion perspective for physical disability practice;
4. describe the various practice settings for OT practice in the arena of physical disabilities;
5. discuss the types of services typically provided in the various practice settings;
6. identify ways in which different practice settings affect the occupational performance of persons receiving occupational therapy services;
7. identify the environmental attributes that afford the most realistic projections of how the client will perform in the absence of the therapist;
8. identify environmental and temporal aspects of at least three practice settings;
9. describe ways in which the therapist can alter environmental and temporal features to obtain more accurate measures of performance;
10. explain how some of the opportunities and challenges which physical disabilities practitioners face today are a result of the way the history of occupational therapy evolved;
11. describe the need for the OTPF in the practice of occupational therapy (OT) for persons with physical disabilities;
12. briefly describe the OT intervention levels, and give an example of each as it might be used in a physical disability practice setting;
13. define hospice and palliative care;
14. explain the therapeutic value of occupational engagement while living with a life- threatening illness;
15. describe the role of occupational therapy in hospice and palliative care, as described in the OTPF;



16. identify outcome measures for hospice and palliative occupational therapy;
17. articulate strategies for clinician self-care;
18. describe the philosophy of the independent living movement and compare and contrast its view of the medical model and the social model of disability;
19. discuss the implications of the independent living movement philosophy in occupational therapy practice;
20. describe the personal context of the disability experience, noting the effects of individual differences, gender, type of disability, interests, beliefs, and stage of life;
21. explain the usefulness of the stage models of disability adaptation;
22. describe the social context of disability using the concepts of stigma, stereotypes, liminality, and spread;
23. discuss the effects on social context of person-first language, the culture of disability, and universal design principles;
24. describe the ways the International Classification of Functioning, Disability and Health (ICF) challenges worldwide, mainstream ideas of health and disability; and
25. discuss various relationship issues between the occupational therapist and the person with a disability.

Course Contents

The Occupational Therapy Practice Framework and the Practice of Occupational Therapy for People with Physical Disabilities. Health Promotion and well-being for People with Physical Disabilities. Personal and social contexts of disability: disability experience, individual differences, stage models of adjustment to disability, social model of disability. Stages of life and self-concept. Understanding individual experience. Social context, social status and disability. Disability as a collective experience. Occupational therapy practice and the independent living philosophy. Person-First Language. Culture of disability. Design and disability. Interactional Process: The Person with a disability and the environment. International Classification of Functioning, Disability, and Health. Relationship between the OT and the person with disability. The Therapist as an environmental factor. Teaching activities in Occupational Therapy Practice settings for physical disabilities: Continuum of healthcare, inpatient settings, community-based settings, outpatient settings. History and practice trends in physical dysfunction intervention. Hospice and Palliative care. Evidence-based for occupational therapy services. Role of occupational therapy. Performance skills and client factors. Evaluation and intervention: Evaluation of motor control. Occupation-based functional motion assessment. Joint range of motion. Evaluation of muscle strength. Evaluation of sensation and intervention for sensory dysfunction. Evaluation and intervention for perception dysfunction. Evaluation and treatment of limited occupational performance secondary to cognitive dysfunction. Eating and swallowing. Pain Management. Disorders of the motor unit. Burns and burn rehabilitation.; Cardiac and pulmonary diseases and rehabilitation.



Learning Outcomes

At the end of this course, students should be able to:

1. develop activity-based intervention plans and strategies, including goals and methods to achieve them based on needs;
2. provide evidence-based effective therapeutic intervention related to performance areas, performance components, and performance contexts directly and in collaboration with the child and family;
3. employ relevant occupations and purposeful activities that support the intervention goals, are culturally relevant, and meaningful to the client;
4. develop and promote the use of appropriate home and community programming to support performance in the child's natural environment;
5. demonstrate the ability to educate and train child/family/caregiver to facilitate skills in performance areas as well as prevention, health maintenance, and safety; and
6. exhibit the ability to use the teaching-learning process with child/family/caregiver, colleagues, other health providers, and the public.

Course Contents

Paediatric OT process. Feeding, swallowing, and oral motor interventions. Cognitive development and interventions. Sensory integration interventions. Intervention in disorders of sensory discrimination, modulation and praxis. Handwriting and fine motor coordination interventions. Neuromotor interventions. Play interventions. OT application (including review of each condition): Cardio respiratory conditions of childhood. Visio-perceptual and Visio-motor dysfunction. Muscular dystrophy. Erb's palsy. Poliomyelitis / PPRP. Spina bifida and hydrocephalus. Nutritional disorders. Mental retardation and Down's syndrome. Congenital Syndromes and Chromosomal abnormalities. Specific learning disabilities. Perverse Developmental Disorder. Attention Deficit Hyperactivity Disorder. Behaviour disorders. Visual / auditory loss. Speech and communication disorder. Acquired Immuno Deficiency Syndrome in paediatrics. Seizure disorders. Haemophilia. Arthrogryphosis and other congenital orthopaedic disorders. Early intervention for congenital neurological disorders (high risk infants). Occupational Therapy in Intensive Care Unit (ICU). Intervention in learning disabilities. Autism Spectrum disorders. Behavior management in paediatrics. Amputations and UE congenital anomalies. Paediatric splinting and adaptive devices (including seating devices, adaptations for feeding, mobility and ambulatory devices); Indication and use of splint for correction of disabilities. Overview of models, Frames of reference and guidelines in the assessments and treatment of various C & A conditions such as Autism, conduct disorders depression, ADHD, Down Syndrome, Learning disabilities, Juvenile Delinquencies, Psychotic disorders and many others.



OCT 424: Introduction to Clinical Work in OT II

(2 Units C: PH 90)

Learning Outcomes

At the end of this course, students should be able to:

1. apply and demonstrate effective professional behaviours on a day-to-day basis when working with clients/patients, multidisciplinary team members and peers;
2. display professional behaviours consistent with the OT Code of Ethics;
3. interpret evaluation findings to diagnose occupational performance and participation based on theory, evidence and interdisciplinary knowledge, to develop occupation-based goals and intervention plans based on the stated needs of the client as well as the data gathered during the evaluation process in collaboration with the client and others;
4. examine and apply direct occupational therapy interventions and procedures to a client;
5. address occupational needs of clients, as identified by site stakeholders, through a collaborative project;
6. apply sound judgment in regard to safety of self and others and adhere to safety regulations throughout the occupational therapy process as appropriate to the setting and scope of practice;
7. document occupational therapy services to ensure accountability of service provision and to meet standards;
8. identify factors that might bias assessment results, such as culture, disability status, and situational variables related to the individual and context;
9. delineate the roles of the healthcare and community providers necessary for care coordination, case management, and transition services; and
10. develop and demonstrate occupation-based intervention plans to address psychosocial and cognitive needs of the client in collaboration with the client and others.

Course Contents

Hands-on skills in assessment, treatment planning, and client intervention. Translation of students' professional behaviour, observation skills, performance skills, and clinical application of their knowledge into a clinical setting;

OCT 425: Research Methods in Medical Rehabilitation

(2 Units C: LH 30)

Learning Outcomes

At the end of the course, students should be able to:

1. explain the importance of research, scholarly activities, and the continued development of a body of knowledge relevant to the profession of occupational therapy;
2. locate and evaluate information, including the quality of research evidence;
3. use research literature to make evidence-based decisions;
4. utilise basic descriptive, correlational, and inferential quantitative statistics and code, analyse, and synthesize qualitative data;
5. critique the validity of research studies, including designs (both quantitative and qualitative) and methodologies;
6. demonstrate the skills necessary to design a research proposal;
7. implement one or more aspects of research methodology. These may be simulated or actual and may include, but are not limited to, designing research instruments, collecting data, and analysing or synthesising data. These research activities may be completed individually, with a group, or with a faculty member;



8. demonstrate basic skills necessary to write a research report in a format for presentation or publication; and
9. demonstrate the process of locating and securing grants and how grants can serve as a fiscal resource for research and practice.

Course Contents

Introduction to Biostatistics. Definitions of statistics and biostatistics. Applications of biostatistics. Data collection from experiments & surveys. Variables: qualitative & quantitative, discrete and continuous. Presentation of data: tabular presentation of data – statistical table, format of a table. Frequency distribution – construction of frequency distribution table, cumulative and relative frequency distribution. Exclusive and inclusive method of classification of data; Diagrammatic presentation of data: bar diagrams, pie diagram, line diagram, pictogram, cartogram or statistical map. Graphical representation of a frequency distribution – histogram, frequency, polygon, frequency curve, ogives or cumulative frequency curves. Quantitative research methods. Qualitative research methods. Research methodology: Introduction to Research methodology. Meaning of research. Objectives of research. Types of research & research approaches. Research problem: statement of the research problem. Statement of purpose and objectives of research problem. Necessity of defining the problem. Research design: meaning of research design, need for research design. Sampling techniques: criteria for selecting a sampling procedure. Measurement & scaling techniques: measurement in research, measurement scales, sources of error in measurement. Methods of data collection: collection of primary data, sampling fundamentals, need for sampling. Analysis of data: types of analysis. Testing of hypothesis.

500 Level

OCT 511: Imaging and Physical Diagnosis

(2 Units C: LH 15; PH 45)

Learning Outcomes

At the end of this course, students should be able to:

1. read and interpret radiographs, CT scan and MRI of conditions commonly seen in Occupational Therapy practice;
2. integrate results of radiological tests into clinical decision-making process in occupational therapy practice;
3. demonstrate familiarity with the use of MRI, CT scan and contrast imaging; and
4. discuss the role of MRI and PET scans in research.

Course Contents

Overview of the principles of radio-density with respect to human tissues. Contrast methods. Effect of projection angle. Correct viewing methods. Fracture assessment and perception of radiographic assessment of the axial and appendicular skeleton. MRI, CT, and contrast imaging of the neuromuscular, musculoskeletal and cardiovascular/pulmonary systems, with an emphasis on weighing radiological test results when formulating differential diagnoses for patients/clients across the lifespan. The role of functional MRI and PET scans in research.



OCT 512: Ergonomics and Universal Design

(2 Units C: LH 30)

Learning Outcomes

At the end of the course, students should be able to:

1. apply intervention strategies for the prevention of injuries and accommodation of disability in the contexts of work environments; and
2. apply interventions designed to alter the contextual factors to foster occupational performance.

Course Contents

Definition ergonomics. The scope of ergonomics in Occupational Therapy. Objectives of Ergonomics. Work simplification and energy saving techniques. Joint protection techniques. Application of ergonomics to various aspects of functional performance: self-care, home-making, school, occupation, and recreation.

Application of ergonomic principles to various physical conditions with the following:

- a.) Physical environment: i. Access, ii. Lighting, iii. Ventilation, iv. Temperature, v. Noise.
- b.) Organisational environment: i. Work flow ii. Work routine/rest breaks iii. Work hours/overtime iv. Work pressure v. Training vi. Line of responsibility C. Individual factors i. Worker interaction ii. Psychological factors D. Individual workstation/task/job i. Tasks ii. Equipment used iii. Tools used iv. Work posture & movements v. Maximum task time.

Principles of universal design in relation to occupational performance and the environment. Overview of the models of occupational therapy that emphasise the importance of environment in occupational performance. Discuss assessments and interventions targeted towards. Architectural barriers and challenges to access, home modification and adaptive equipment such as grab bars, raised toilet seat and many others; Adaptations to the environment that support performance, participation and well-being. Measurement and details of disability friendly work spaces and rooms. Functional capacity evaluation. Accommodation of disability in the context of work environments.

OCT 513: Clinical Work in OT I

(2 Units C: PH 90)

Learning Outcomes

At the end of this course, students should be able to:

1. demonstrate competency in managing therapist-patient, therapist-assistant and student-clinical instructor relationships;
2. demonstrate entry-level skills in patient/client management;
3. demonstrate advanced clinical reasoning skills under supervision of licensed Occupational therapists;
4. demonstrate therapeutic use of self, including one's personality, insights, perceptions, and judgments, as part of the therapeutic process in individual interaction;
5. discuss and evaluate personal and professional abilities and competencies as they relate to job responsibilities;
6. effectively interact through written, oral and nonverbal communication with the client, family, significant others, colleagues and other health providers in their assigned setting in a professionally acceptable manner;
7. document occupational therapy services to ensure accountability of service provision and to meet standard for reimbursement of services;
8. demonstrate the ability to use appropriate screening and assessment tools and procedures to



- evaluate the client's occupational performance;
9. use evaluation findings based on appropriate theoretical approaches, models of practice, and frames of reference to develop occupation-based intervention plans and strategies;
 10. grade and adapt the environment, tools, materials, occupations and interventions to reflect the changing needs of the client, the sociocultural context, and technological advances;
 11. provide occupational therapy interventions and procedures to enhance safety, health and wellness, and performance in ADL's and IADL's;
 12. describe the interdisciplinary, referral, and consultative processes; and
 13. discuss the continuum of care to include understanding of the role of OT in care coordination, case management, & transition services.

Course Contents

Students will be assigned to clinical settings appropriate for their knowledge base at that level of the program. Clinical sites may include specialty areas such as paediatrics, geriatrics, burn rehabilitation, psychiatry and home care settings and many others. Students will be required to present a 20-minute case report concerning one relevant case for occupational therapy based on their clinical experience; OT students along with consultants in the faculty and clinical instructors will participate in Grand Rounds. This experience will focus on exploring the expectations of occupational therapy students in a clinical setting.

OCT 514: Organisation and Administration in Occupational Therapy (2 Units C: LH 30)

Learning Outcomes

At the end of this course, students should be able to:

1. define and discuss terms related to management;
2. explain the role of the supervisor within the clinic settings;
3. discuss the broad spectrum of influences that impact on health care delivery and ethical practice; and
4. plan the setting up of a new department.

Course Contents

Management of a hospital-based department and staff. Management of a district-based rehabilitation service. Understanding the needs and concerns of OTA. Ethical obligation of OTs towards OTA. Steps in setting up a private practice. Management, leadership and supervisory process. Quality control, time management. Budgeting and financial controls. Stock taking, resource utilisation and management. Team work. Cultural sensitivity and diversity markers in Nigeria. In view of the new government policies cultural sensitivity towards diversity is central to all facets of life. Portfolio is used to develop critical thinking and reflective learning.



OCT 515: Occupational Therapy in Mental Health

(2 Units C: LH 30)

Learning Outcomes

At the end of this course, students should be able to:

1. identify occupational therapy assessment strategies;
2. identify and explain psychiatric diagnoses based on the mostly current diagnostic and statistical manual DSM;
3. describe the models and frame of references used in mental health settings;
4. demonstrate occupational therapy process and practice in contemporary mental health contexts; and
5. apply theoretical and practical knowledge of recovery.

Course Contents

Model of human occupation (MOHO). Ecological models used in mental health (Person-Environment-occupation-Performance Model, Ecology of human performance). Overview of mental health conditions: depression; Cognitive behavioural therapy. International occupation-based models used in mental health (KAWA model, Canadian Model of Occupational Performance). Therapeutic use of self theories and strategies to enhance occupational performance. Overview of substance use disorders and drug induced psychosis. Overview of schizophrenia and other psychotic conditions.

OCT 521: Vocational Rehabilitation

(2 Units C: LH 15; PH 45)

Learning Outcomes

At the end of this course, students should be able to:

1. apply principles of case management within relevant legislative frameworks to facilitate return to work of an injured worker;
2. recommend appropriate assessments, interventions and evaluations in order to respond to changes in human systems and work environment resulting from disabilities, chronic health conditions, injury and abnormal development or of a psychological nature and which affects vocational performance;
3. develop appropriate program plans including selection of assessments, interventions and evaluations with regard to risk identification and management using vocational rehabilitation theories and processes;
4. differentiate between models of employment support for individuals with physical, intellectual and psychosocial conditions; and
5. provide clear, accurate and comprehensive documentation as required for the relevant regulatory organisation(s) for vocational rehabilitation programs.

Course Contents

Knowledge and skills related to occupational and vocational rehabilitation. Work-related injury management. Employment support for people with an activity or participation restriction. Case management occupational rehabilitation and available disability legislation. Application of previously developed skills of observation and report writing. Simulated professional practice experience and workplace visits to provide opportunity for students to apply learned skills and knowledge.



OCT 522: Evidence-Based Practice

(2 Units C: LH 15; PH 45)

Learning Outcomes

At the end of this course, the students should be able to:

1. demonstrate skills in making clinical decisions;
2. exhibit competence in searching, identifying, locating, retrieving, understanding and applying the principles of research to the practice of OT;
3. evaluate the relevance and credibility of research evidence and decide appropriately when faced with conflicting information in the literature;
4. contribute to the rehabilitation literature as clinicians by completing modules on case reports and the peer review process; and
5. demonstrate ability of being knowledgeable consumers of research and the professional literature as it relates to the practice of OT.

Course Contents

Key concepts of evidence-based rehabilitation science. Issues relating to diagnosis, prognosis, and intervention. Making clinical decisions that are consistent with evidence in professional literature. Experience in searching the literature by developing clinical questions in a form that is compatible with electronic search engines and learning differences in available electronic data bases. Types of professional writing useful to occupational therapists including: grant proposals, journal articles, books, client education materials, and presentation of proposals and papers. Form and content of a range of technical documents and the processes of writing, peer review and critique.

CT 523: Clinical Work in OT II

(2 Units C: PH 90)

Learning Outcomes

At the end of the course, the students should be able to:

1. gather necessary pre-test information or materials before interviewing or testing patient/client;
2. select evaluation and/or tools which are appropriate to the patient/client;
3. administer test/interview evaluation in a climate appropriate to the patient's/client's disability, age and personality;
4. administer test/interview evaluation in a climate appropriate to the patient's/client's disability, age and personality;
5. demonstrate competence in evaluation techniques/instruments by adapting method to elicit data when standardized or recommended technique is not possible;
6. obtain additional or supplementary information from appropriate persons and available records;
7. define problem areas for treatment using information from interviews and observations as well as data from appropriate tests;
8. determine long-term treatment goals in accordance with probable discharge situation and develops treatment plan with patient;
9. guide patient's/client's selection of appropriate activities to lead achievement;
10. demonstrate ability to establish treatment priorities and proposes several alternatives or solutions to problems;
11. arrange equipment and materials according to treatment purpose;
12. set appropriate limits in response to undesirable physical or social behaviour;



13. select or modify available treatment environment to support patient's/client/s best performance;
14. establish and maintain therapeutic relationship with patient/client;
15. re-evaluate patient's/client's status at appropriate intervals;
16. demonstrate awareness of the patient's/client's status by making programme; modifications in response to changes in the patient/client or his environment
17. plan for patient's/client's discharge in adequate time;
18. demonstrate ability to terminate treatment appropriately;
19. evaluate the effectiveness of treatment procedures used;
20. demonstrate the appropriate professional attitudes and values required for OT practice;
21. interpret occupational therapy to others according to their level of interest; and
22. demonstrate ability to collaborate with OT assistant and OT aide.

Course Contents

In-depth experience in delivering occupational therapy services to clients. Focusing on the application of purposeful and meaningful occupation and research, administration, and management of occupational therapy services. It is recommended that the student be exposed to a variety of clients across the life span and to a variety of settings.

OCT 524: Special Topic Seminar

(2 Units C: SH 60)

Learning Outcomes

At the end of this course, the students should be able:

1. demonstrate skills required for seminar presentation (search, collate information and make presentation); and
2. discuss current trends and issues in allied health professions.

Course Contents

Consideration of current trends and issues in the area of allied health profession. Group discussions relating to philosophy of methods of treatment in rehabilitation generally and in each medical rehabilitation profession. Examination of problems and issues in rehabilitation. Ethics. Administrative topics in rehabilitation.

OCT 525: Research Project (Dissertation)

(3 Units C: PH 135)

Learning Outcomes

At the end of this course, students should be able to:

1. investigate an identified research problem; and
2. report findings from the investigation in a dissertation using the departmental format.

Course Contents

Students will be guided by a supervisor. The choice of a project will be in an area in which the student is interested within the OT profession. This will lead to a dissertation, which will be presented for assessment during the final examination.



Minimum Academic Standards

Equipment

The list of minimum equipment is organised based on the skills laboratory needed for the acquisition of competencies in occupational therapy. Essential laboratory includes Activity of Daily Living (ADL) laboratory, multisensory laboratory, vocational rehabilitation laboratory, splint and assistive devices laboratory and possibly paediatric laboratory.

Activities of Daily Living Laboratory

1. Living room chairs.
2. Weighted Cuffs.
3. Hand Shower.
4. Standing Mirror.
5. Adjustable Hanging Rack and Hangers.
6. ADL Board, Stairway.
7. Non-Slip Mat.
8. 3-in-1 Commode.
9. Water Closet.
10. Book Shelf.
11. Hand Cones.
12. Peg Board.
13. Wheel Chair.
14. Bath Railings.
15. Bed.
16. Bed/Sliding Sheets.
17. Pillows.
18. Bathtub.
19. Kitchen wares (Oven, Kettle, Cutlery).
20. Typical living apartment.
21. Shower Chair.
22. Grab Bars.
23. Toilet raisers.
24. Transfer Tub Bench.
25. Grooming Set.
26. Plate Guard.

Multi-sensory laboratory

1. UV Pegs and Light Panel.
2. Mood Cube.
3. Sensory Balls.
4. Easy Grip Balls.
5. LED Multi Colour Rope Light.
6. Sky curve Platform Swing.
7. Bubble Tube Novelty Lamp.
8. Sensory Bubble Column.
9. Essential Aromatherapy Oils.
10. Therapy Balls.
11. Sound Oasis Sleep Therapy Pillows.
12. Weighted blanket and jacket.

Vocational rehabilitation laboratory



1. VALPAR Work Components.
2. MODASP work component.
3. Cardboards, Drawing paints.
4. Fishing line and beads.
5. Jamar hand dynamometer and pinch meter.
6. Work Ability Screening Profile (WASP-II).
7. Scissors, pencils and crayons (different colors and sizes).
8. 3- piece Hand evaluation set.

Splint and assistive technology laboratory

1. Low Temperature Thermoplastic.
2. Plumbing Pipe (PVC).
3. Heat Gun.
4. Zadding material.
5. Gum.
6. Foreign Velcro.
7. Leather.
8. Gait Belt.
9. 3D Printers.
10. Manual wheelchairs.
11. Rollator.
12. Cerebral Palsy Chair.
13. Corner Chair.
14. Universal Cuffs.
15. Dycem Roll (8" by 6.5').
16. Knob Extender.
17. Transfer Board.
18. Bed Safety Rail.
19. Book Holder.
20. Medication Aid.
21. Reading/Writing Aid.
22. Pill Box/Pill Organizer.
23. Typing Stick.
24. Handheld Glass Magnifier.
25. Reacher.
26. Hip Kit (dressing stick, sock aid, button hook, elastic shoe lace).
27. Cotton tape (2").
28. D ring.
29. Rivet Pin (husband and wife).
30. Walker.
31. Cane (quad, tripod, single).

Paediatric laboratory

1. Bolster.
2. Positioning Wedges.
3. Peanut Ball.
4. Trampoline.
5. Tunnel.
6. Climbing System (Ladders).
7. Ball Bath and Balls.



8. Therapy Foam/Mat.
9. Goniometer.
10. Sphygmomanometer.
11. Pulse oximeter.
12. Test-tubes.
13. Balance beam.
14. Balance board.
15. Lego/building blocks.
16. Pegs,Gym ball.
17. Dart board.
18. Balance path.
19. Puzzles.
20. Tape measure.
21. Height adjustable plinth.
22. Peg Board (26" by 22"), ROM arc (31" long).
23. Dressing Board.
24. Cone Board.
25. Table-top games (ludo, chess, scrabble, card).
26. Silicon theraputty.
27. Digi-flex.
28. Theraband.
29. Bubbles.
30. Straws.
31. Toys with sound and light.

Staffing

The University shall ensure the provision of adequate human, physical, equipment and library facilities in all the learning areas with strong information communication technology infrastructure for the implementation of these minimum standards.

The minimum ratio of academic staff to students in Basic Medical Sciences (part 2 or 3) shall be 1:15 while the minimum for clinical occupational therapy shall be 1:10. Only occupational therapists currently registered with the Medical Rehabilitation Therapist Board (MRTB) of Nigeria and with acceptable postgraduate qualifications shall qualify to teach Occupational Therapy at the University level. Clinical skills laboratory shall be manned by qualified laboratory technologist/technicians who must have a diploma or bachelor degree in occupational therapy.

Non-teaching Staff shall not exceed 50% of Academic Staff. The ratio of technical staff to student should not exceed 1:30.

Library

There shall be a dedicated medical library with adequate provision of current books and journals periodicals and bibliographic indices on occupational therapy. The library shall have modern information communication facilities for electronic access and retrieval of information. The deployment of these resources, including teaching units, should be organised in a Department of Occupational Therapy



Classrooms, Laboratories and Offices Space

Classroom

The standard requirement of 0.65m² per full-time student should be maintained. Thus the minimum total space requirement for a faculty or department shall be the product of its total full time equivalent student enrolment (FTE) and the minimum space requirement per full-time equivalent i.e. (FTE) 0.65m².

Office

In this respect, each academic staff should have an office space of at least 25 square metres taking into cognisance the status/cadre of the staff

In addition, there should be for the Faculty, a Dean's office and for each Department a Head of Department's office with attached offices for their supporting staff as specified below in m²:

| | | |
|----------------------------------|---|-------|
| Professor's office | - | 18.50 |
| Head of Department's office | - | 18.50 |
| Tutorial teaching staff's office | - | 13.50 |
| Other teaching staff space | - | 7.00 |
| Technical staff space | - | 7.00 |
| Secretarial space | - | 7.00 |
| Staff research laboratory | - | 16.50 |
| Seminar Space/per student | - | 1.85 |
| Laboratory space (per student) | - | 7.50 |

Laboratories

There shall be at least three of the essential skill laboratories where students will acquire practical skills that are germane for competent clinical practice. The skill laboratories shall be adequately furnished with the minimum equipment described in the equipment list section of this curriculum. Each laboratory must be well illuminated and ventilated and must be equipped with fire extinguisher as well as well stocked first aid box.

Clinics

There shall be an affiliated occupational therapy department in a teaching hospital where students will attend clinical posting and acquire fieldwork experience.



O.D Optometry

Overview

The practice of Optometry in Nigeria is regulated by a professional board known as Optometrists and Dispensing Opticians Registration Board of Nigeria (ODORBN). As obtained in different climes, the Optometry programme shall domicile in any of the respective University's College / Faculty or School of Optometry and Vision Science (USA and Canada); OR Faculty / School of Health Sciences (Australia, UK, Nigeria, South Africa and Sweden); OR Faculty of Sciences (Australia, Canada and Nigeria).

The first and second years of the programme are dedicated solely to basic science courses. The third and fourth years offer courses like physiological and ophthalmic optics and pre-clinical optometry among many other hands-on clinical courses. The fifth year is divided in two: the first half is composed of more classes and the second half is structured for a six-month externship (industrial, clinical and practical exposure) that leads into the sixth year. The sixth year focuses on clinical hands-on, seminars, and projects. Graduates from this programme shall be awarded an **Unclassified OD** degree as a Pass or Pass with distinction.

After successful completion at an accredited University Optometry programme, the graduates will write a professional examination, after which successful candidates are inducted into the profession by the Board, and issued a provisional license. This provisional license which gives the opportunity to apply for internship is valid for only one year. Interns must carry out the one year-long internship before they can proceed for the National Youth Service Corps (NYSC) scheme. In 2008, the first post graduate Optometry and Vision Science programme commenced at the University of Benin.

Philosophy

The Philosophy of the Doctor of Optometry (OD) programme is based on the necessity to appreciate recent advances in technology to meet the modern day challenges in Optometry education, and meet the present day practice needs by seeking to impart body of knowledge necessary to cope with these advances within and outside Nigeria, through training, development of abilities, expertise, skills and responsibilities. Precisely, the philosophy is to train and produce highly knowledgeable, clinically skilled and professionally competent Optometrists who can meet the present and future eye health care and visual needs of the people globally.

Objectives

The objectives of the OD degree programme are to:

1. provide students with a broad and balanced foundation of knowledge in Optometry and Vision Science as well as practical and clinical skills;
2. instil in students a sense of enthusiasm for Optometry, an appreciation of its application in different contexts and to involve them in an intellectually stimulating and satisfying experience of continuous learning and studying;
3. develop in students the ability to apply their knowledge in Optometry, and skills to the solution of theoretical and practical problems in Optometry and Vision Science;
4. produce Optometry graduates with broad and balanced foundation, and a range of transferable practical and clinical skills of value in line with best global practices;



5. produce Doctors of Optometry with skills and ethics with which they can practice the profession;
6. provide students with knowledge and skills base with which they can proceed to further studies in specialised areas of Optometry and Vision Science; and
7. generate in students an appreciation of importance of Optometry in an Industrial, Clinical, Economic, Environmental and Social context.

Unique Features of the Programme

The unique features of this programme are followings:

1. normal duration for the programme is 6 years after secondary school;
2. name/title of the degree programme is Doctor of Optometry (OD);
3. the degree is unclassified;
4. the curriculum covers eight (8) specialty areas in Optometry profession;
5. bridge model of didactic and clinical training;
6. concurrency of classroom lectures, laboratory and clinical instructions in client/patient's handling under supervision; and
7. the programme produces graduates with: 1) ability to communicate well; 2) good problem solving skills; 3) good team spirit and adaptability; 4) caring and understanding attitude; 5) good analytical and clinical skills; 6) potential for hard work and good reasoning skills in client / patient management.

Employability Skills

The Optometry and Vision Science programme prepares graduates for areas of specialisation in the profession of Optometry, which include the following: Primary care Optometry, Cornea and contact lens care, Ocular health, Pediatric Optometry, Orthoptics, Low Vision and Rehabilitative Optometry, Environmental and Public Health Optometry, and Vision Science. Graduates can work in government hospitals, military forces, government parastatals, community health centers, private eye clinics, universities, research institutes, industries, government parastatals, and non-governmental organisations/agencies. This six-year OD programme curriculum aligns with the expected outcomes / competencies of the World Council of Optometry. In countries like USA and Canada, Optometrists complete pre-professional undergraduate (at least three years) degree in a university, and then four years of professional Optometry education at a university college or school of Optometry, leading to the Doctor of Optometry (OD) degree. This curriculum is comparable with those of developed countries. Graduates from the programme are eligible to sit for licensing examinations in Nigeria and various countries like USA, Canada, UK and Australia who are accepted leaders in Optometry; and these are countries whose curricula have been reviewed to benchmark this curriculum.

21st Century Skills

1. Critical thinking, problem solving, reasoning, analysis, interpretation, synthesising information
2. Research skills and practices, interrogative questioning
3. Creativity, artistry, curiosity, imagination, innovation, personal expression
4. Perseverance, self-direction, planning, self-discipline, adaptability, initiative
5. Oral and written communication, public speaking and presenting, listening
6. Leadership, teamwork, collaboration, cooperation, facility in using virtual workspaces
7. Information and communication technology (ICT) literacy, media and internet literacy, data interpretation and analysis, computer programming.



Admission and Graduation Requirements

The modes of admission are Unified Tertiary Matriculation Examination (UTME) and Direct Entry. To be admitted into the programme the candidate must meet the entry requirements stated below. Throughout the course of study, the student is required to maintain a professional code of conduct as embodied in the fundamental ethical principles of the Optometry profession. The Department/School/Faculty of Optometry and Vision Science offering the Optometry programme will serve as a guardian of these principles on behalf of the Board. At the end of academic training, the successful candidates would be recommended to the University Senate through the Faculty for the award of Doctor of Optometry (OD) degree.

1. **Six-Year Degree programme:** Candidate for admission into the 100 level of study must have a minimum of Five (5) Senior Secondary Certificate (SSC) credits or its equivalents at one sitting in English, Mathematics, Physics, Chemistry, and Biology.
2. **Direct Entry (DE):**
 - i. Candidate must have passed Physics, Chemistry, and Biology at A/Level General Certificate of Education (GCE) or its equivalent with a minimum aggregate of 13 points
 - ii. A bachelor's degree in any Basic Sciences, Medical Science or related Health Sciences from a recognised / accredited University with a minimum of second-class upper division in addition to the one-sitting five SSC basic requirements.
 - iii. Higher National Diploma with minimum of Upper Credit from a recognised Institution in addition to the one-sitting five SSC basic requirements depending on the appropriateness of their requisite academic preparation.

NOTE: All candidates for Direct Entry must fulfil all the UTME entry requirements. Additionally, they must register and pass all compulsory general study courses at 100 and 200 Levels.

Attainment levels

The degree shall be **Unclassified**. Excellence shall be recognized through the awards of distinction and prizes. Methods of assessment shall include:

1. Formal examinations
2. Laboratory reports/records
3. Problem-solving exercises
4. Oral presentations



Global Course Structure

Preamble

Courses shall be provided leading to the degree of Doctor of Optometry (OD), which may be awarded to students who have successfully fulfilled all academic requirements and whose conduct conform to ethics expected of a prospective Optometrist. The Optometry training shall be a combination of teacher-directed, tutorial-guided, self-learning and problem-based methods as well as hands-on including clinical teaching / learning and laboratory activities.

Course Structure

1. the non-Optometry subject's areas to be covered shall include, but not limited to the following: Physics, Chemistry, Biology, Mathematics, Computer Science, Gross Anatomy and Histology, Physiology, Biochemistry, Pathology, Pharmacology, Biostatistics, Medical Ethics/Sociology, Entrepreneurship, Psychology, Endocrinology and Nutrition;
2. the period of teaching and learning at "a" above represents the basic and pre-clinical phase of the programme;
3. the Optometry modalities and basic procedure courses are taught at the 200/300 levels, which serves as the Optometry Introductory / Pre-clinical Phase;
4. the Clinical Phase of the training where applications of basic procedures in managing specific clinical conditions are taught and learned with hands-on practical exposures, runs from 400 to 600 level of the programme; and
5. no student shall be allowed to proceed to the clinical phase of the training until all the pre-requisite pre-clinical courses have been satisfactorily passed.

100 Level

| Course Code | Course Title | Unit(s) | Status | LH | PH |
|-------------|--------------------------------|-----------|--------|----|----|
| GST 111 | Communication in English | 2 | C | 30 | - |
| GST 112 | Nigerian Peoples and Culture | 2 | C | 30 | - |
| BIO 101 | General Biology I | 2 | C | 30 | - |
| BIO 102 | General Biology II | 2 | C | 30 | - |
| BIO 107 | General Biology Practical I | 1 | C | - | 45 |
| BIO 108 | General Biology Practical II | 1 | C | - | 45 |
| CHM 101 | General Chemistry I | 2 | C | 30 | - |
| CHM 102 | General Chemistry II | 2 | C | 30 | - |
| CHM 107 | General Chemistry Practical I | 1 | C | - | 45 |
| CHM 108 | General Chemistry Practical II | 1 | C | - | 45 |
| MTH 101 | Elementary Mathematics I | 2 | C | 30 | - |
| MTH 102 | Elementary Mathematics II | 2 | C | 30 | - |
| PHY 101 | General Physics I | 2 | C | 30 | - |
| PHY 102 | General Physics II | 2 | C | 30 | - |
| PHY 107 | General Physics Practical I | 1 | C | - | 45 |
| PHY 108 | General Physics Practical II | 1 | C | - | 45 |
| | Total | 26 | | | |



200 level

| Course Code | Course Title | Unit(s) | Status | LH | PH |
|--------------------|---------------------------------------|----------------|---------------|-----------|-----------|
| GST 212 | Philosophy, Logic and Human Existence | 2 | C | 30 | - |
| ENT 211 | Entrepreneurship and Innovation | 2 | C | 30 | - |
| ANA 201 | Anatomy of Upper and Lower Limb | 3 | C | 30 | 45 |
| ANA 203 | General and Systemic Embryology | 2 | C | 30 | - |
| BCH 201 | General Biochemistry I | 2 | C | 30 | - |
| OPT 203 | Optics Laboratory | 1 | C | - | 45 |
| PIO 201 | Introductory Physiology and Blood | 2 | C | 30 | - |
| PIO 203 | Physiology of Excitable Tissues | 2 | C | 30 | - |
| OPT 215 | Geometrical Optics | 1 | C | 15 | - |
| OPT 216 | Physical Optics | 1 | C | 15 | - |
| OPT 218 | Ocular Anatomy I | 2 | C | 15 | 45 |
| OPT 220 | Ocular Anatomy Laboratory | 1 | C | - | 45 |
| OPT 224 | History of Optometry | 1 | C | 15 | - |
| | Total | 21 | | | - |

Note: Direct Entry students must register for and pass all 100 Level GST courses.

300 Level

| Course Code | Course Title | Unit(s) | Status | LH | PH |
|--------------------|---------------------------------------|----------------|---------------|-----------|-----------|
| ENT 312 | Venture Creation | 2 | C | 15 | 45 |
| GST 312 | Peace and Conflict Resolution | 2 | C | 30 | - |
| OPT 301 | Ophthalmic Optics Laboratory | 1 | C | - | 45 |
| OPT 302 | Physiological Optics Laboratory I | 1 | C | - | 45 |
| OPT 303 | Physiological Optics I | 2 | C | 15 | 45 |
| OPT 305 | Ophthalmic Optics I | 2 | C | 30 | - |
| OPT 306 | Ophthalmic Optics II | 1 | C | 15 | - |
| OPT 307 | General Optometry 1 | 2 | C | 30 | - |
| OPT 309 | Ocular Anatomy II | 1 | C | 15 | - |
| OPT 311 | Ocular Physiology | 1 | C | 15 | - |
| OPT 312 | General Optometry II | 1 | C | 15 | - |
| OPT 313 | General Pathology | 1 | C | 15 | - |
| OPT 315 | Optometric Ethics and Jurisprudence | 1 | C | 15 | - |
| OPT 316 | Physiological Optics II | 1 | C | 15 | - |
| OPT 318 | Ocular Genetics and Molecular Biology | 1 | C | 15 | - |
| OPT 322 | Ocular Neurophysiology | 2 | C | 30 | - |
| OPT 324 | General Pharmacology | 1 | C | 30 | - |
| OPT 326 | Ocular Microbiology | 2 | C | 15 | 45 |
| | Total | 25 | | | |



400 level

| Course Code | Course Title | Unit(s) | Status | LH | PH |
|--------------------|------------------------------------|----------------|---------------|-----------|-----------|
| OPT 401 | Physiological Optics Laboratory II | 1 | C | - | 45 |
| OPT 402 | Clinical and Mechanical Optics I | 2 | C | 15 | 45 |
| OPT 403 | General Optometry Laboratory | 1 | C | - | 45 |
| OPT 405 | Physiological Optics III | 2 | C | 15 | 45 |
| OPT 406 | Ocular Pathology I | 2 | C | 30 | - |
| OPT 407 | General Optometry III | 1 | C | 15 | - |
| OPT 409 | Ocular Pathology II | 1 | C | 15 | - |
| OPT 410 | Endocrinology and Nutrition | 1 | C | 15 | - |
| OPT 411 | Ocular Pharmacology | 1 | C | 15 | - |
| OPT 412 | General Optometry IV | 1 | C | 15 | - |
| OPT 413 | Contact Lenses I | 2 | C | 30 | - |
| OPT 414 | Contact Lenses II | 2 | C | 15 | 45 |
| OPT 415 | Optometric Instrumentation | 1 | C | - | 45 |
| OPT 416 | Physiological Optics IV | 1 | C | 15 | - |
| OPT 417 | Epidemiology | 1 | C | 15 | - |
| OPT 418 | Environmental Vision | 1 | C | 15 | - |
| OPT 419 | Functional Optometry | 1 | C | 15 | - |
| OPT 420 | Strabismus and Amblyopia | 2 | C | 15 | 45 |
| OPT 422 | Scientific Research & Methodology | 2 | C | 30 | - |
| | Total | 26 | | | |

500 Level

| Course Code | Course Title | Unit(s) | Status | LH | PH |
|--------------------|---|----------------|---------------|-----------|-----------|
| OPT 501 | Clinical and Mechanical Optics II | 1 | C | - | 45 |
| OPT 503 | Primary Optometry Clinic | 2 | C | - | 90 |
| OPT 505 | Contact Lens Clinic | 1 | C | - | 45 |
| OPT 507 | Specialty Optometry Laboratory | 1 | C | - | 45 |
| OPT 509 | Paediatric Optometry | 1 | C | 15 | - |
| OPT 511 | Low Vision and Rehabilitative Optometry | 2 | C | 15 | 45 |
| OPT 513 | Optometric Practice Management | 1 | C | 15 | - |
| OPT 515 | Orthoptics | 2 | C | 15 | 45 |
| OPT 517 | Geriatric Optometry | 1 | C | 15 | - |
| OPT 519 | Applied Psychology for Optometrists | 1 | C | 15 | - |
| OPT 521 | Community Optometry Outreach | 1 | C | - | 45 |
| OPT 598 | Externship and SIWES | 3 | C | - | 135 |
| | Total | 17 | | | |

*Note: OPT 598 course runs through 500 Level 2nd semester and the immediate long vacation preceding 600 Level. This is to satisfy the "one-tier 6 month" Students Industrial Work Exposure Scheme (SIWES) requirement.



600 level

| Course Code | Course Title | Unit(s) | Status | LH | PH |
|-------------|--------------------------------------|-----------|--------|----|-----|
| OPT 601 | Primary Care Optometry Clinic I | 2 | C | - | 90 |
| OPT 602 | Primary Care Optometry Clinic II | 2 | C | - | 90 |
| OPT 603 | Rehabilitative and Low Vision Clinic | 1 | C | - | 45 |
| OPT 604 | Paediatric Clinic | 1 | C | - | 45 |
| OPT 605 | Patient Management Seminars | 1 | C | - | 45 |
| OPT 607 | Advanced Practice Management | 1 | C | 15 | - |
| OPT609 | Neuropathology | 1 | C | 15 | - |
| OPT 611 | Seminar in Research Topics | 1 | C | - | 45 |
| OPT 613 | Hospital Practice Exposure | 1 | C | - | 45 |
| OPT 698 | Research Project | 3 | C | - | 135 |
| | Total | 14 | | | |

Course Contents and Learning Outcomes**100 level****GST 111: Communication in English****(2 Units C: LH 15; PH 45)****Learning Outcomes**

At the end of this course, students should be able to:

1. identify possible sound patterns in English Language;
2. list notable Language skills;
3. classify word formation processes;
4. construct simple and fairly complex sentences in English;
5. apply logical and critical reasoning skills for meaningful presentations;
6. demonstrate an appreciable level of the art of public speaking and listening; and
7. write simple and technical reports.

Course Contents

Sound patterns in English Language (vowels and consonants, phonetics and phonology). English word classes (lexical and grammatical words, definitions, forms, functions, usages, collocations). Sentence in English (types: structural and functional, simple and complex). Grammar and Usage (tense, mood, modality and concord, aspects of language use in everyday life). Logical and Critical Thinking and Reasoning Methods (Logic and Syllogism, Inductive and Deductive Argument and Reasoning Methods, Analogy, Generalisation and Explanations). Ethical considerations, Copyright Rules and Infringements. Writing Activities: (Pre-writing, Writing, Post writing, Editing and Proofreading; Brainstorming, outlining, Paragraphing, Types of writing, Summary, Essays, Letter, Curriculum Vitae, Report writing, Note making and many others, Mechanics of writing). Comprehension Strategies: (Reading and types of Reading, Comprehension Skills, 3RsQ). Information and Communication Technology in modern Language Learning. Language skills for effective communication. Major word formation processes. Writing and reading comprehension strategies. Logical and critical reasoning for meaningful presentations. Art of public speaking and listening.



GST 112: Nigerian Peoples and Culture

(2 Units C: LH 30)

Learning Outcomes

At the end of the course, students should be able to:

1. analyse the historical foundation of the Nigerian culture and arts in pre-colonial times;
2. list and identify the major linguistic groups in Nigeria;
3. explain the gradual evolution of Nigeria as a political unit;
4. analyse the concepts of Trade, Economic and Self-reliance status of the Nigerian peoples towards national development;
5. enumerate the challenges of the Nigerian State towards Nation building;
6. analyse the role of the Judiciary in upholding people's fundamental rights;
7. identify acceptable norms and values of the major ethnic groups in Nigeria; and
8. list and suggest possible solutions to identifiable Nigerian environmental, moral and value problems.

Course Contents

Nigerian history, culture and art up to 1800 (Yoruba, Hausa and Igbo peoples and culture; peoples and culture of the ethnic minority groups). Nigeria under colonial rule (advent of colonial rule in Nigeria; Colonial administration of Nigeria). Evolution of Nigeria as a political unit (amalgamation of Nigeria in 1914; formation of political parties in Nigeria; Nationalist movement and struggle for independence). Nigeria and challenges of nation building (military intervention in Nigerian politics; Nigerian Civil War). Concept of trade and economics of self-reliance (indigenous trade and market system; indigenous apprenticeship system among Nigeria people; trade, skill acquisition and self-reliance). Social justices and national development (law definition and classification. Judiciary and fundamental rights. Individual, norms and values (basic Nigeria norms and values, patterns of citizenship acquisition; citizenship and civic responsibilities; indigenous languages, usage and development; negative attitudes and conducts. Cultism, kidnapping and other related social vices). Re-orientation, moral and national values (The 3R's – Reconstruction, Rehabilitation and Re-orientation; Re-orientation Strategies: Operation Feed the Nation (OFN), Green Revolution, Austerity Measures, War Against Indiscipline (WAI), War Against Indiscipline and Corruption (WAIC), Mass Mobilization for Self-Reliance, Social Justice and Economic Recovery (MAMSER), National Orientation Agency (NOA). Current socio-political and cultural developments in Nigeria.

BIO 101: General Biology I

(2 Units C: LH 30)

Learning Outcomes

At the end of this course, students should be able to:

1. explain cell's structure and organisations;
2. summarise functions of cellular organelle;
3. characterise living organisms and state their general reproduction;
4. describe the interrelationship that exists between organisms;
5. discuss the concept of heredity and evolution; and
6. enumerate habitat types and their characteristics.



Course Contents

Cell structure and organisation. functions of cellular organelles. characteristics and classification of living things. chromosomes, genes their relationships and importance. General reproduction. Interrelationships of organisms (competitions, parasitism, predation, symbiosis, commensalisms, mutualism, saprophytism). Heredity and evolution (introduction to Darwinism and Lamarckism, Mendelian laws, explanation of key genetic terms). Elements of ecology and types of habitat.

BIO 102: General Biology II

(2 Units C: LH 30)

Learning Outcomes

At the end of the lectures, students should be able to:

1. List the characteristics, methods of identification and classification of Viruses, bacteria and fungi;
2. state the unique characteristics of plant and animal kingdoms;
3. describe ecological adaptations in the plant and animal kingdoms;
4. explain nutrition, respiration, excretion and reproduction in plants and animals; and
5. describe growth and development in plants and animals.

Course Contents

Basic characteristics, identification and classification of viruses, bacteria and fungi. A generalised survey of the plant and animal kingdoms based mainly on the study of similarities and differences in the external features. Ecological adaptations. Briefs on physiology to include nutrition, respiration, circulatory systems, excretion, reproduction, growth and development.

BIO 107: General Biology Practical I

(1 Unit C: PH 45)

Learning Outcomes

At the end of the course, students should be able to:

1. outline common laboratory hazards;
2. provide precautions on laboratory hazards;
3. state the functions of the different parts of microscope;
4. use the microscope and describe its maintenance;
5. draw biological diagrams and illustrations; and
6. apply scaling and proportion to biological diagrams.

Course Contents

Common laboratory hazards: prevention and first aid. Measurements in biology. Uses and care of microscope. Compound and dissecting microscope. Biological drawings and illustration, scaling, accuracy and proportion; use of common laboratory apparatus and laboratory experiments designed to illustrate the topics covered in BIO 101.



BIO 108: General Biology Practical II

(1 Unit C: PH 45)

Learning Outcomes

At the end of the course, students should be able to:

1. describe the anatomy of flowering plants;
2. differentiate types of fruit and seeds;
3. state ways of handling and caring for biological wares;
4. describe the basic histology of animal tissues; and
5. identify various groups in the animal kingdom.

Course Contents

Anatomy of flowering plants, primary vegetative body: stem, leaf and root to show the mature tissues namely parenchyma, collenchyma, sclerenchyma, xylem and phloem. Types of fruits and seeds. Care and use of dissecting kits and other biological wares. Dissection and general histology of animal tissues based on vertebrate forms. Morphology and functions of epithelial, muscular, nervous and connective tissues. Examination of various groups of lower invertebrates under microscopes, identification of various groups of organisms in Animal Kingdom. And any experiment designed to emphasise the practical aspects of topics in BIO 102.

CHM 101: General Chemistry I

(2 Units C: LH 30)

Learning Outcomes

At the end of this course, the students should be able to:

1. define atom, molecules and chemical reactions;
2. discuss the Modern electronic theory of atoms;
3. write electronic configurations of elements on the periodic table;
4. rationalise the trends of atomic radii, ionization energies, electronegativity of the elements based on their position in the periodic table;
5. identify and balance oxidation – reduction equation and solve redox titration problems.
6. draw shapes of simple molecules and hybridized orbitals;
7. identify the characteristics of acids, bases and salts, and solve problems based on their quantitative relationship;
8. apply the principles of equilibrium to aqueous systems using Le Chatelier's principle to predict the effect of concentration, pressure and temperature changes on equilibrium mixtures;
9. analyse and perform calculations with the thermodynamic functions, enthalpy, entropy and free energy; and
10. determine rates of reactions and its dependence on concentration, time and temperature.

Course Contents

Atoms, molecules and chemical reactions. Modern electronic theory of atoms. Electronic configuration, periodicity and building up of the periodic table. Hybridization and shapes of simple molecules. Valence Forces. Structure of solids. Chemical equations and stoichiometry. Chemical bonding and intermolecular forces. Kinetic theory of matter. Elementary thermochemistry. Rates of reaction. Equilibrium and thermodynamics. Acids, bases and salts. Properties of gases. Redox reactions and introduction to electrochemistry. Radioactivity.



CHM 102: General Chemistry II

(2 Units C: LH 30)

Learning Outcomes

At the end of this course, the students should be able to:

1. state the importance and development of organic chemistry;
2. define fullerenes and its applications;
3. discuss electronic theory;
4. determine the qualitative and quantitative of structures in organic chemistry;
5. describe rules guiding nomenclature and functional group classes of organic chemistry;
6. determine rate of reaction to predict mechanisms of reactions;
7. identify classes of organic functional group with brief description of their chemistry;
8. discuss comparative chemistry of group 1A, IIA and IVA elements; and
9. describe basic properties of Transition metals.

Course Contents

Historical survey of the development and importance of Organic Chemistry. Fullerenes as fourth allotrope of carbon, uses as nanotubes, nanostructures, nanochemistry. Electronic theory in organic chemistry. Isolation and purification of organic compounds. Determination of structures of organic compounds including qualitative and quantitative analysis in organic chemistry. Nomenclature and functional group classes of organic compounds. Introductory reaction mechanism and kinetics. Stereochemistry. The chemistry of alkanes, alkenes, alkynes, alcohols, ethers, amines, alkyl halides, nitriles, aldehydes, ketones, carboxylic acids and derivatives. The Chemistry of selected metals and non-metals. Comparative chemistry of group IA, IIA and IVA elements. Introduction to transition metal chemistry.

CHM 107: General Chemistry Practical I

(1 Unit C: PH 45)

Learning Outcomes

At the end of the course the students should be able to:

1. state the general laboratory rules and safety procedures;
2. collect scientific data and correctly carrying out Chemical experiments;
3. identify the basic glassware and equipment in the laboratory;
4. state the differences between primary and secondary standards;
5. perform redox titration;
6. recording observations and measurements in the laboratory notebooks; and
7. analyse the data to arrive at scientific conclusions.

Course Contents

Laboratory experiments designed to reflect topics presented in courses CHM 101 and CHM 102. These include acid-base titrations, qualitative analysis, redox reactions, gravimetric analysis, data analysis and presentation.



CHM 108: General Chemistry Practical II

(1 Unit C: PH 45)

Learning Outcomes

At the end of this course, the students should be able to:

1. identify the general laboratory rules and safety procedures;
2. collect scientific data and correctly carrying out Chemical experiments;
3. identify the basic glassware and equipment in the laboratory;
4. identify and carry out preliminary tests which includes ignition, boiling point, melting point, test on known and unknown organic compounds;
5. perform solubility tests on known and unknown organic compounds;
6. conduct elemental tests on known and unknown compounds; and
7. conduct functional group/confirmatory test on known and unknown compounds which could be acidic / basic / neutral organic compounds.

Course Contents

Continuation of CHM 107. Additional laboratory experiments to include functional group analysis, quantitative analysis using volumetric methods.

MTH 101: Elementary Mathematics I (Algebra and Trigonometry) (2 Units C: LH 30)

Learning Outcomes

At the end of this course students should be able to:

1. explain basic definition of Set, Subset, Union, Intersection, Complements and use of Venn diagrams;
2. solve quadratic equations;
3. Solve trigonometric functions;
4. identify various types of numbers; and
5. solve some problems using Binomial theorem.

Course Contents

Elementary set theory, subsets, union, intersection, complements, venn diagrams. Real numbers, integers, rational and irrational numbers. Mathematical induction, real sequences and series. Theory of quadratic equations. Binomial theorem. Complex numbers. Algebra of complex numbers. The Argand diagram. De-Moivre's theorem, nth roots of unity. Circular measure, trigonometric functions of angles of any magnitude, addition and factor formulae.

MTH 102: Elementary Mathematics II (Calculus)

(2 Units C: LH 30)

Learning Outcomes

At the end of this course students should be able to:

1. identify the types of rules in differentiation and integration;
2. describe the meaning of Function of a real variable, graphs, limits and continuity; and
3. solve some applications of definite integrals in areas and volumes.



Course Contents

Function of a real variable, graphs, limits and idea of continuity. The derivative, as limit of rate of change. Techniques of differentiation. Extreme curve sketching; Integration as an inverse of differentiation. Methods of integration, Definite integrals. Application to areas, volumes.

PHY 101: General Physics I (Mechanics)

(2 Units C: LH 30)

Learning Outcomes

At the end of the course, student should be able to;

1. identify and deduce the physical quantities and their units;
2. differentiate between vectors and scalars;
3. describe and evaluate motion of systems on the basis of the fundamental laws of mechanics;
4. apply Newton's laws to describe and solve simple problems of motion;
5. evaluate work, energy, velocity, momentum, acceleration, and torque of moving or rotating objects;
6. explain and apply the principles of conservation of energy, linear and angular momentum;
7. describe the laws governing motion under gravity; and
8. explain motion under gravity and quantitatively determine behaviour of objects moving under gravity.

Course Contents

Space and time. Units and dimension, Vectors and Scalars. Differentiation of vectors: displacement, velocity and acceleration. Kinematics. Newton laws of motion (Inertial frames, Impulse, force and action at a distance, momentum conservation). Relative motion. Application of Newtonian mechanics. Equations of motion. Conservation principles in physics. Conservative forces. Conservation of linear momentum. Kinetic energy and work. Potential energy. System of particles. Centre of mass. Rotational motion: Torque, vector product, moment, rotation of coordinate axes and angular momentum. Polar coordinates. Conservation of angular momentum. Circular motion. Moments of inertia. gyroscopes and precession. Gravitation: Newton's Law of Gravitation. Kepler's Laws of Planetary Motion. Gravitational Potential Energy. Escape velocity. Satellites motion and orbits.

PHY 102: General Physics II (Electricity & Magnetism)

(2 Units C: LH 30)

Learning Outcomes

At the end of this course, the student should be able to:

1. describe the electric field and potential, and related concepts, for stationary charges;
2. calculate electrostatic properties of simple charge distributions using Coulomb's law, Gauss's law and electric potential;
3. describe and determine the magnetic field for steady and moving charges;
4. determine the magnetic properties of simple current distributions using Biot-Savart and Ampere's law;
5. describe electromagnetic induction and related concepts, and make calculations using Faraday and Lenz's laws;
6. explain the basic physical of Maxwell's equations in integral form;
7. evaluate DC circuits to determine the electrical parameters; and
8. determine the characteristics of ac voltages and currents in resistors, capacitors, and Inductors.



Course Contents

Forces in nature. Electrostatics; electric charge and its properties, methods of charging. Coulomb's law and superposition. electric field and potential. Gauss's law. Capacitance. Electric dipoles. Energy in electric fields. Conductors and insulators, current, voltage and resistance. Ohm's law and analysis of DC circuits. Magnetic fields. Lorentz force. Biot-Savart and Ampère's laws. magnetic dipoles. Dielectrics. Energy in magnetic fields. Electromotive force. Electromagnetic induction. Self and mutual inductances. Faraday and Lenz's laws. Step up and step-down transformers: Maxwell's equations. Electromagnetic oscillations and waves. AC voltages and currents applied to inductors, capacitors, resistance, and combinations.

PHY 107: General Practical Physics I

(1 Unit C: PH 45)

Learning Outcomes

At the end of the course, the student should be able to;

1. conduct measurements of some physical quantities;
2. make observations of events, collect and tabulate data;
3. identify and evaluate some common experimental errors;
4. plot and analyse graphs; and
5. draw conclusions from numerical and graphical analysis of data.

Course Contents

This introductory course emphasises quantitative measurements. The treatment of measurement errors, and graphical analysis. A variety of experimental techniques should be employed. The experiments include studies of meters, the oscilloscope, mechanical systems, electrical and mechanical resonant systems. Light. Heat. Viscosity and many others, covered in PHY 101 and PHY 102. However, emphasis should be placed on the basic physical techniques for observation, measurements, data collection, analysis and deduction.

PHY 108: General Practical Physics II

(1 Unit C: PH 45)

Learning Outcomes

At the end of this course, the student should be able to:

1. conduct measurements of some physical quantities;
2. make observations of events, collect and tabulate data;
3. identify and evaluate some common experimental errors;
4. plot and analyse graphs;
5. draw conclusions from numerical and graphical analysis of data; and
6. prepare and present practical reports.



Course Contents

This practical course is a continuation of PHY 107 and is intended to be taught during the second semester of the 100 level to cover the practical aspect of the theoretical courses that have been covered with emphasis on quantitative measurements. The treatment of measurement errors, and graphical analysis. However, emphasis should be placed on the basic physical techniques for observation, measurements, data collection, analysis and deduction.

200 Level

GST 212: Philosophy, Logic and Human Existence

(2 Units C: LH 30)

Learning Outcomes

A student who has successfully gone through this course should be able to:

1. describe the basic features of philosophy as an academic discipline;
2. identify the main branches of philosophy & the centrality of logic in philosophical discourse;
3. state the elementary rules of reasoning;
4. distinguish between valid and invalid arguments;
5. think critically and assess arguments in texts, conversations and day-to-day discussions;
6. critically assess the rationality or otherwise of human conduct under different existential conditions;
7. develop the capacity to extrapolate and deploy expertise in logic to other areas of knowledge, and
8. guide his or her actions, using the knowledge and expertise acquired in philosophy and logic.

Course Contents

Scope of philosophy; notions, meanings, branches and problems of philosophy. Logic as an indispensable tool of philosophy. Elements of syllogism, symbolic logic— the first nine rules of inference. Informal fallacies, laws of thought, nature of arguments. Valid and invalid arguments, logic of form and logic of content — deduction, induction and inferences. Creative and critical thinking. Impact of philosophy on human existence. Philosophy and politics, philosophy and human conduct, philosophy and religion, philosophy and human values, philosophy and character molding and many others.

ENT 211: Entrepreneurship and Innovation

(2 Units C: LH 30)

Learning Outcomes

At the end of this course, students should be able to:

1. explain the concepts and theories of entrepreneurship, intrapreneurship, opportunity seeking, new value creation, and risk taking;
2. state the characteristics of an entrepreneur;
3. analyse the importance of micro and small businesses in wealth creation, employment, and financial independence;
4. engage in entrepreneurial thinking;
5. identify key elements in innovation;
6. describe stages in enterprise formation, partnership and networking including business planning; and
7. describe contemporary entrepreneurial issues in Nigeria, Africa and the rest of the world.
8. state the basic principles of e-commerce.



Course Contents

Concept of Entrepreneurship (Entrepreneurship, Intrapreneurship/Corporate Entrepreneurship). Theories, rationale and relevance of entrepreneurship (Schumpeterian and other perspectives, risk-taking, necessity and opportunity-based entrepreneurship and creative destruction). Characteristics of entrepreneurs (Opportunity seeker, risk taker, natural and nurtured, problem solver and change agent, innovator and creative thinker). Entrepreneurial thinking (Critical thinking, reflective thinking, and creative thinking). Innovation (Concept of innovation, dimensions of innovation, change and innovation, Knowledge and innovation). Enterprise formation, partnership and networking (Basics of business plan, forms of business ownership, business registration and forming alliances and joint ventures). Contemporary entrepreneurship issues (Knowledge, skills and technology, intellectual property, virtual office, networking). Entrepreneurship in Nigeria (Biography of inspirational entrepreneurs, youth and women entrepreneurship, entrepreneurship support institutions, youth enterprise networks and environmental and cultural barriers to entrepreneurship). Basic principles of e-commerce.

ANA 201: Anatomy of Upper & Lower Limbs

(3 Units C: LH 30; PH 45)

Learning Outcomes

At the end of this course, students should be able to:

1. define fundamental anatomical terminology and discuss the anatomical position;
2. describe the anatomy of the musculoskeletal system, including the axial skeleton; appendicular skeleton, appendicular and axial muscles, and arthrology;
3. describe the general features of the bones of the upper and lower limbs;
4. identify the major muscles of the upper and lower limbs;
5. explain the types and structure of the joints of the upper and lower limbs;
6. correlate between the attachment of the muscles and their functions on the different joints;
7. identify the major nerves of the upper and lower limbs;
8. describe the functional components of each of the major nerves and its distribution;
9. identify and describe the course of the major superficial veins of the upper and lower limbs; and
10. name the major arteries of the upper and lower limbs.

Course Contents

Descriptive terms, plans and terms of relationship of the human body, terms of comparison, attachment of muscles, types of muscles, movements of joints. Osteology, principles of kinesiology, general organisation of body system. Cutaneous innervation of the upper limb; pectoral region; breast; axilla; shoulder region; arm and cubital fossa; flexor compartment of forearm; extensor compartment of forearm; hand; venous and lymphatic drainage of the upper limb. Applied anatomy of nerves; blood supply of the upper limb. Cutaneous innervation of the lower limb; femoral triangle; adductor canal and medial side of the thigh; gluteal region; back of the thigh, popliteal fossa; extensor compartment of the leg and dorsum of the foot; peroneal and flexor compartment of the leg; sole of the foot, arches of the foot; mechanism of walking; venous and lymphatic drainage of the lower limb; applied anatomy of the nerves and blood supply to the lower limb.



ANA 203: General and Systemic Embryology

(2 Units C: LH 30)

Learning Outcomes

At the end of the course, students should be able to:

1. explain how the embryo is form from the zygote;
2. discuss the role of cleavage and gastrulation in animal development;
3. demonstrate; understanding of embryology and significance of prenatal diagnostic methods;
4. describe structural features of primordia in tissue and organs at different developmental stages;
5. define risk periods in histo- and organogenesis; and
6. analyse the most often observed developmental anomalies.

Course Contents

Spermatogenesis, oogenesis; ovarian follicles; ovulation; corpus luteum; menstruation; uterine cycle; hormonal control of uterine cycle; fertilisation; cleavage; implantation; reproductive technologies-IVF/surrogacy/embryo transfer; embryo manipulation & potency/twinning; molecular embryology and transgenesis; gastrulation; notochord, neurulation; derivatives of the germ layers; folding of the embryo; fetal membranes; placenta; development of limbs and teratology. Growth and perinatology; congenital malformations – general introduction. The cardiovascular system, skin, structure of the nails and hair. Macrophagic system; cellular immunology; lymphoid organs; glands – endocrine and exocrine. Respiratory system. Digestive system. Urinary and genital systems. Electron micrograph studies of each organ.

BCH 201: General Biochemistry I

(2 Units C: LH 30)

Learning Outcomes

At the end of the course, students should be able to:

1. explain the structure of different macromolecules in biological system;
2. identify types of chemical reactions involving these macromolecules;
3. explain the various methods of isolation of these macromolecules;
4. estimate the effects of acids and alkalis on the macromolecules;
5. describe purification of macromolecules; and
6. discuss quantification of the various macromolecules.

Course Contents

Introductory chemistry of amino acids, their properties, reactions and biological functions. Classification of amino acids: neutral, basic and acidic; polar and non-polar; essential and non-essential amino acids. Peptides. Introductory chemistry and classification of proteins. Biological functions of proteins. Methods of their isolation, purification and identification. Primary, secondary, tertiary and quaternary structures of proteins. Basic principles of tests for proteins and amino acids. Introductory chemistry of carbohydrates, lipids and nucleic acids. Nomenclature of nucleosides and nucleotides, effects of acid and alkali on hydrolysis of nucleic acids.



PHS 202: Biostatistics

(2 Units C: LH 30)

Learning Outcomes

At the end of the course, students should be able to:

1. demonstrate knowledge of interval estimation and hypothesis testing;
2. apply the correct statistical method to analyse one or more variables;
3. interpret statistical results effectively and correctly;
4. appreciate the importance of data and demonstrate reasonable statistical skills; and
5. explain the concept of sampling from a study population in a health study.

Course Contents

The course is planned to equip the undergraduates in all the disciplines of health sciences with the necessary tools and skills for collecting, analysing, interpreting data quantitatively. Topics to be covered include: The central role of statistics in health sciences disciplines, data description, elements of probability, description of random variables, applications of the binomial and normal distributions, estimation and confidence intervals, contingency tables, regression and variance analysis, study design and hypothesis testing. For practical purposes, students are provided with specific data to work on and are also required to develop simple questionnaire protocols for analysis.

OPT 203: Optics Laboratory

(1 Unit C: PH 45)

Learning Outcomes

At the end of Optics Laboratory course, the students should be able to:

1. identify different types of lenses and mirrors;
2. describe the nature of images formed by different lenses and mirrors;
3. differentiate between real and virtual images;
4. state the relationship between the object size and image size by a concave mirror as well as magnification;
5. determine the power of the convex lens as well as magnification;
6. describe how to set up the optical bench with lens holders, lenses, screen position to calculate focal length; and
7. explain the use of a meter rule in focal length determination.

Course Contents

Techniques learned in geometrical and physical optics are practiced using optical bench experiments; object-image relationship, with lenses and mirrors. Magnification. Aberration; Effect of prisms on rays. Ray tracing. Optical principles of lensometry.



PIO 201 Introductory Physiology and Blood

(2 Units C: LH 30)

Learning Outcomes

At the end of this course, students should be able to:

1. describe the composition of a cell membrane;
2. explain how a potential difference across a membrane will influence the distribution of a cation and an anion;
3. describe how transport rates of certain molecules and ions are accelerated by specific membrane transport proteins;
4. distinguish between active (primary and secondary) transport, facilitated diffusion, and passive diffusion based on energy source and carrier protein involvement;
5. identify the mechanisms and role of selective transporters for amino acids, neurotransmitters, nutrients, etc.;
6. explain the general concepts of homeostasis and the principles of positive and negative feedback in physiological systems;
7. identify the site of erythropoietin production, the stimulus for its release, and the target tissue for erythropoietin action;
8. discuss the normal balance of red blood cell synthesis and destruction, including how imbalances in each lead to anemia or polycythemia;
9. list and differentiate the various types of leukocytes;
10. describe the role of thrombocytes in haemostasis; and
11. list clotting factors and the discuss the mechanism of anti-coagulants.

Course Contents

Introduction and history of physiology. Structure and functions of cell membranes. Transport process. Special transport mechanism in amphibian bladder, kidney, gall bladder, intestine, astrocytes and exocrine glands. Biophysical principles. Homeostasis and control systems including temperature regulation. Biological rhythms. Composition and functions of blood. Haemopoiesis. WBC and differential count. Plasma proteins Coagulation, fibrinolysis and platelet functions. Blood groups – ABO system – Rh system. Blood transfusion – indication for collection and storage of blood, hazards of blood transfusions. Reticulo- endothelial system. Immunity and immodeficiency disease and HIV.

PIO 203 Physiology of Excitable Tissues

(2 Units C: LH 30)

Learning outcomes

At the end of this course, students should be able to:

1. list the steps in excitation-contraction coupling in skeletal muscle;
2. describe the structure of the neuromuscular junction;
3. list some intracellular factors that can cause muscle fatigue;
4. describe the distinguishing characteristics of multi-unit and unitary smooth muscles;
5. explain the steps in the excitation-contraction coupling mechanism in cardiac muscle and compare with skeletal muscle including different mechanisms for sarcoplasmic reticulum calcium release;
6. explain how the resting membrane potential is generated
7. state the Nernst equation, and indicate how this equation accounts for both the chemical and electrical driving forces that act on an ion;



8. discuss the mechanisms by which an action potential is propagated along both nonmyelinated and myelinated axons;
9. describe the principle of the voltage clamp and how it is used to identify the ionic selectivity of channels; and
10. discuss the disorders that can occur at the neuromuscular junction.

Course Contents

Structure and functions of nerves, cardiac muscle, smooth muscle and skeletal muscle, Muscles: structure, excitation, theories of excitation-contraction. Membrane potentials. Nerve generation and conduction of impulse and its physiological properties. Synapses and synaptic transmission

OPT 215: Geometrical Optics

(1 Unit C: LH 15)

Learning Outcomes

At the end of OPT 215 (Geometrical Optics) course, students should be able to:

1. appreciate the importance of the relationship of optics to the eye's optical media, particularly the crystalline lens;
2. have good knowledge of the different types of lenses and mirrors;
3. describe the formation of images by both concave and convex mirrors;
4. describe the formation of images by both concave and convex lenses;
5. describe the principles of reflection and refraction in the formation of images;
6. describe how to use light source to construct images formed through rays tracing; and
7. have knowledge about some optical instruments and their functions such as telescope and microscope.

Course Contents

The course deals with the study of the nature, properties and phenomena of light in optical media. Principles of geometrical optics including reflections and refractions. Formation of images. The influence of mirrors and lenses. Spherical and cylindrical lenses; mirrors; thin and thick lenses. Lens systems; Ray tracing. Apertures; Prisms. Aberrations. Lens formulae, symbols, design and optical instruments. Neutrallisation; Transposition and specification of ophthalmic lenses. Laboratory work is included.

OPT 216: Physical Optics

(1 Unit C: LH 15)

Learning Outcomes

At the end of OPT 216 (Physical optics) course, the students should be able to:

1. state the types of waves and their properties;
2. devise how to deduce the wave formulas;
3. demonstrate light interferences and diffraction in the laboratory;
4. state the function of polarization in binocular vision;
5. describe how to measure light by the use of some scientific instruments such as spectrophotometer, radiation thermocouples, radiometer and many others; and
6. discuss the principle of optical bench set-up for ray tracing and focal point determination.



Course Contents

Principles of wave optics, interferences, diffraction, polarization, radiometry, holography, quantum nature of light, spectroscopy, lasers. Relativistic optics. Laboratory work is included.

OPT 218: Ocular Anatomy I

(2 Units C: LH 15; PH 45)

Learning Outcomes

At the end of OPT 218 (Ocular Anatomy I) course, the students should be able to:

1. identify the basic parts of the eye and surrounding structures including the orbit;
2. identify the nerves, muscles and blood vessels that are related to the eye and vision in general;
3. describe the tears formation, secretion and drainage and its regulations;
4. discuss the rotations of the eye, in order to be able to discover certain eye movement problems; and
5. identify certain ocular disorders resulting from different parts of the eye.

Course Contents

An overview of the anatomy of the eye and orbit. Structure of the orbit, eye lids, lachrymal apparatus, conjunctiva, sclera, cornea, anterior chamber iris, posterior chamber, lens, ciliary body and extra ocular muscles.

OPT 220: Ocular Anatomy Laboratory

(1 Unit C: PH 45)

Learning Outcomes

At the end of Ocular Anatomy Laboratory course, the students should be able to:

1. describe how to dissect and prepare slides of sections of the eyeball;
2. identify different sections of the eye;
3. describe how to use the microscope to view slides using different magnification;
4. identify the different orbital bones and sutures of the eye;
5. identify the fossi of the orbit; and
6. have good knowledge of the cranial fossi.

Course Contents

Prepared slides of various section of the eye. Identification of bones and sutures, fossi of the orbits and Cranium. Dissection of Bovine eye.

OPT 224: History of Optometry

(1 Unit C: LH 15)

Learning Outcomes

At the end of the History of Optometry course, the student should be able to:

1. explain the history and development of Optometry as a profession;
2. discuss Hammurabi the sixth king of Babylon who established standards and laws for commercial interactions between individuals and trades;
3. discuss development through the middle age centuries, the renaissance period and the seventeenth / eighteenth centuries regarding optometry;
4. describe the golden age of optics till present period;
5. discuss the history of Optometry in Nigeria; and



6. state the roles of organisations like Nigerian Optometric Association, Optometrists and Dispensing Opticians Registration Board of Nigeria; and the World Council of Optometry.

Course Contents

History of Optometry: Development of Optometry as a profession. The ancient times and personalities (such as the code of Hammurabi); The middle age centuries; the renaissance period; the seventeenth and eighteenth centuries. The golden age of optics till present period, including history of Optometry in Nigeria. Roles of the Nigerian Optometric Association; Optometrists and Dispensing Opticians Registration Board of Nigeria; World Council of Optometry. First institution to start Optometry education in Nigeria. The first Nigerian institution to commence the Doctor of Optometry programme. An introduction to Optometric terms.

300 Level

GST 312: Peace and Conflict Resolution

(2 Units C: LH 30)

Learning Outcomes

At the end of the GST 312 (Peace and Conflict Resolution) course, students should be able to:

1. analyse the concepts of peace, conflict, and security;
2. list major forms, types and root causes of conflict and violence;
3. differentiate between conflict and terrorism;
4. enumerate security and peace building strategies; and
5. describe roles of international organisations, media, and traditional institutions in peace building.

Course Contents

Concepts of peace, conflict, and security in a multi-ethnic nation. Types and theories of conflicts: Ethnic, religious, economic, geo-political conflicts; Structural conflict theory, Realist Theory of conflict, Frustration-Aggression Conflict Theory. Root causes of conflict and violence in Africa: Indigene and settlers' phenomenon; Boundaries/boarder disputes; political disputes; ethnic disputes and rivalries; economic inequalities; social disputes; Nationalist movements and agitations; selected conflict case studies – Tiv-Junkun; Zango Kartaf, Chieftaincy and land disputes and many others. Peace building, management of conflicts and security: Peace & human development. Approaches to peace & conflict management --- (Religious, Government, Community Leaders and many others). Elements of peace studies and conflict resolution: Conflict dynamics assessment scales: Constructive & destructive. Justice and legal framework: Concepts of social justice; The Nigeria Legal System. Insurgency and terrorism. Peace mediation and peace keeping. Peace & security council (International, National and Local levels) agents of conflict resolution – Conventions, Treaties Community Policing: Evolution and imperatives. Alternative Dispute Resolution, ADR. Dialogue b). Arbitration c). Negotiation d). Collaboration and many others. Roles of International Organisations in Conflict Resolution. (a). The United Nations, UN and its Conflict Resolution Organs. (b). The African Union & Peace Security Council (c). ECOWAS in Peace Keeping. Media and Traditional Institutions in peace building. Managing post-conflict situations/crisis: Refugees. Internally Displaced Persons, IDPs. The role of NGOs in Post-conflict situations/crisis.



ENT 312: Venture Creation

(2 Units C: LH 15; PH 45)

Learning Outcomes

At the end of this course, students, through case study and practical approaches, should be able to:

1. describe the key steps in venture creation;
2. spot opportunities in problems and in high potential sectors regardless of geographical location;
3. state how original products, ideas, and concepts are developed;
4. develop business concept for further incubation or pitching for funding;
5. identify key sources of entrepreneurial finance;
6. implement the requirements for establishing and managing micro and small enterprises;
7. conduct entrepreneurial marketing and e-commerce;
8. apply a wide variety of emerging technological solutions to entrepreneurship; and
9. appreciate why ventures fail due to lack of planning and poor implementation.

Course Contents

Opportunity identification (Sources of business opportunities in Nigeria, environmental scanning, demand and supply gap/unmet needs/market gaps/market research, unutilised resources, Social and climate conditions and technology adoption gap). New business development (business planning, market research). Entrepreneurial finance (Venture capital, equity finance, micro finance, personal savings, small business investment organisations and business plan competition). Entrepreneurial marketing and e-commerce (Principles of marketing, customer acquisition & retention, B2B, C2C and B2C models of e-commerce, first mover advantage, e-commerce business models and successful e-Commerce companies,). Small business management/family business: Leadership & management, basic book keeping, nature of family business and family business growth model. Negotiation and business communication (Strategy and tactics of negotiation/bargaining, Traditional and modern business communication methods). Opportunity discovery demonstrations (Business idea generation presentations, Business idea contest, brainstorming sessions, idea pitching). Technological solutions (The concept of market/customer solution, customer solution and emerging technologies, business applications of new technologies - Artificial intelligence (AI), virtual/mixed reality (VR), Internet of things (IoTs), Blockchain, Cloud Computing, Renewable energy and many others. Digital business and e-commerce strategies).

OPT 301: Ophthalmic Optics Laboratory

(1 Unit C: PH 45)

Learning Outcomes

At the end of OPT 301 (Ophthalmic Optics Laboratory) course, students should be able to:

1. define the physico-chemical properties of frame materials;
2. identify different type of ophthalmic frames and their categories;
3. state how to measure the parameters of ophthalmic frames;
4. describe how to measure patient pupillary distance both at far and near distances;
5. assist in selecting the right ophthalmic frame for patient;
6. identify different types of corrective ophthalmic lens materials;
7. prepare lens format based on type of frame;
8. describe techniques of cutting, chipping and fitting lenses into frames; and
9. explain the concept of hands-on frame repairs.



Course Contents

Techniques learned in ophthalmic optics lectures are practiced. Frame and facial measurement. Approach of frame selection, and patient styling. Ophthalmic lens materials, manufacture, surfacing and edging. Mounting of lenses into frames and frame repairs.

OPT 302: Physiological Optics Laboratory I

(1 Unit C: PH 45)

Learning Outcomes

At the end of OPT 302 (Physiological Optics Laboratory) course, the students should be able to:

1. demonstrate and identify Purkinje images (reflections of objects from the optical structures of the eye);
2. describe the principle and know different types of optometer;
3. describe the principle and the use of refractometer;
4. discuss about schematic eye, visual acuities, stereo acuity and contrast sensitivity; and
5. conduct/perform experiment on measurement with optometer set-up, using the badal optometer.

Course Contents

Measurement with Optometer set-ups; Demonstration of Purkinje images, optical aberrations, effect of defocus on visual acuity and refractive anomalies. Schematic eye, visual acuities; vernier acuity, stereoacuity, optometer, contrast sensitivity. "AC/A ratio"

OPT 303: Physiological Optics I

(2 Units C: LH 15; PH 45)

Learning Outcomes

At the end of OPT 310 (Physiological Optics I) course, students should be able to:

1. identify the various ocular tissue structures with optical properties;
2. identify the contribution(s) of the various tissues to the optics of the eye;
3. identify and know the features of a schematic eye and the different types of schematic eye;
4. define the different types of refractive errors, their presentation and characteristics;
5. describe optical aberration and the different types of optical aberrations;
6. describe what optometer is, the different types of optometer and their features;
7. explain what visual acuity entails, its notations, and the different ways it can be assessed;
8. differentiate between visual acuity and vernier acuity;
9. explain purkinje images in relation to ocular surfaces' reflections as well as uses of the purkinje images; and
10. demonstrate refractive errors, optical aberrations, acuity, optometer, and purkinje images in a laboratory set-up.

Course Contents

The eye as an optical instrument; reduced and schematic eyes; anomalies of refraction and optical aberrations of the eye. The Badal optometer; resolution and visual acuity. Laboratory work is included.



OPT 305: Ophthalmic Optics I

(2 Units C: LH 30)

Learning Outcomes

At the end of OPT 305 (Ophthalmic Optics I) course, the students should be able to:

1. differentiate the different types of ophthalmic lens materials and know when to use plastic or glass lenses;
2. identify different types of spherical, aspheric, and toric lenses;
3. record sphero-cylindrical (astigmatic) lenses;
4. perform transposition of cylindrical and sphero-cylindrical lenses from plus to minus or minus to plus cylinder form;
5. perform hand neutralisation of spherical and sphero-cylindrical lenses;
6. verify the power of any spectacle lens using the lensmeter / focimeter;
7. explain how to resolve, compound prism;
8. perform relevant calculation of lens curvatures and thickness using lens measures;
9. discuss the principle of prism (how to induce prismatic effect in a spectacle lens (decentration) and
10. recognise the importance of centration and decentration to avoid prismatic effects.

Course Contents

The history and development of ophthalmic lenses, lens materials and frames. Manufacture of spectacle materials; ophthalmic glass; plastic lenses and frames. Forms of spectacle lenses: spherical, cylindrical; toric or sphero-cylindrical lenses. Single vision lens designs; base curve, surface powers, front vertex power, back vertex power, effective power. Lens neutralization; spherical power; cylindrical power and toric lenses. Transposition. Lensometry. Parts of frames; frame measurements and designs; IPD measurement; Lens and frame specifications; Toric surfaces; centration and decentration; ophthalmic prisms and prismatic effects. Special lenses.

OPT 306: Ophthalmic Optics II

(1 Unit C: LH 15)

Learning Outcomes

At the end of OPT 306 (Ophthalmic Optics II) course, the students should be able to:

1. explain the different type of bifocal and multifocal lenses and their functions;
2. identify different types of coats, tints / dyes and mechanism of absorptive lenses;
3. explain the reason behind dispensing tinted, photochromic and protective lenses;
4. explain and differentiate high power lenses such as lenticular lens, high index lenses and many others;
5. discuss about the manufacturing of lenses both glass and plastic lenses;
6. identify different parts of ophthalmic frames, and concept of impact resistance;
7. obtain interpupillary distance measurements;
8. discuss the concept of lens and frame specifications;
9. explain facial measurements of presbyopic patient for proper lens fitting; and
10. describe the principle of vertex power in the optics of both contact and spectacle lenses.

Course Contents

Bifocal and multifocal lenses; base curve and near ADD; types and specifications of bifocal segments; trifocals; absorptive lenses; coats; tints and dyes; optics of contact lenses and low vision devices; impact resistance.



OPT 307: General Optometry 1

(2 Units C: LH 30)

Learning Outcomes

At the end of OPT 307 (General Optometry I) course, students should be able to:

1. discuss the historical development of optometry as a profession through the golden
2. age of optics (ophthalmic optics) to optometry;
3. describe the optics of spherical lenses, cylindrical lenses, sphero-cylindrical lenses, toric lenses, and ophthalmic prisms in relation to their clinical uses;
4. identify all the components and the arrangement of the components of a trial set/refraction unit;
5. state the classification of refractive errors and how each can be corrected;
6. have basic knowledge of what accommodative and binocular vision anomaly entails;
7. discuss the science and clinical steps involved in case history assessment;
8. discuss the science and clinical steps involved in visual acuity assessment;
9. discuss the science and clinical steps involved in cover test examination, Maddox rod test, Maddox wing test, stereo-acuity test, and red lens test;
10. discuss the science and clinical steps involved in worth-4-dot test; and
11. discuss the science and clinical steps involved in inter-pupillary distance (IPD) assessment.

Course Contents

Review of optics of spherical, cylindrical, sphero-cylindrical or toric lenses as well as ophthalmic prisms. Trial lens set and refraction-examination accessories. Overview of refractive status of the eye: concepts of emmetropia and ametropia. Distribution, classification and correction of refractive errors; concept of emmetropization. Introduction to accommodative and binocular anomalies. Scope of general optometric examination: Case history, theory and clinical measurement of visual acuity, cover test. Maddox rod test, Red lens test, Worth-4-dot test, Maddox wing test, Stereo-acuity and inter-pupillary distance (IPD). The types and incidence of refractive errors.

OPT 309: Ocular Anatomy II

(1 Unit C: LH 15)

Learning Outcomes

At the end of OPT 309 (Ocular Anatomy II) course, students should be able to:

1. describe the refractive media of the eye and their properties such as aqueous and vitreous humors;
2. identify the layers of the retina and how they contribute to vision perception;
3. identify the cranial nerves that are involved with vision and eye movements;
4. describe how the eye gets its nourishments from the several blood vessels; and
5. discuss how the eye developed from the embryo.

Course Contents

The structure of the vitreous, choroid and retina. Nerve and blood supplies to the eye and orbit. Embryology and development of the eye. Laboratory work is included.



OPT 311: Ocular Physiology

(1 Unit C: LH 15)

Learning Outcomes

At the end of OPT 311 (Ocular Physiology) course, students should be able to:

1. discuss the basic functions of the different parts of the eye and their disease states;
2. identify how the eye bring about vision through the refractive media and light perception;
3. identify the basic refractive disorders; their anatomies and correction;
4. explain intraocular pressure and its disorders; and
5. describe basic tear dynamics and regulations.

Course Contents

The physiology of the eye. Functions of the eyelids, lacrimal apparatus. Conjunctiva sclera, cornea, anterior and posterior chamber, iris lens, ciliary muscle, retina, choroid and optic nerve. Production and drainage of extra and intraocular fluids. Intra ocular pressure. Metabolism. Laboratory work is included.

OPT 312: General Optometry II

(1 Unit C: LH 15)

Learning Outcomes

At the end of OPT 312 (General Optometry II) course, the students should be able to:

1. describe the procedure involved in carrying out ocular penlight examination, the recording of the findings, and clinical implication of the findings;
2. describe the procedure involved in carrying out ocular trans-illumination test, the recording of the findings, and clinical implication of the findings;
3. describe the procedure involved in carrying out pupillary function test, the recording and clinical implication of the findings;
4. describe the procedure involved in carrying out version and vergence test, the recording of the findings, and clinical implication of the findings;
5. describe the procedure used in assessing far and near point of accommodation, the recording and clinical implication of the findings;
6. explain how to use a raf rule and a placido disc, the pattern of recording findings of these tests and the clinical significance of the findings;
7. conduct munson sign and ocular palpation assessments, the recording of findings and clinical significance of findings;
8. discuss perimetry, the types and their basic features;
9. conduct different tests/device used in colour vision assessment, the procedure, recording, and clinical significance of findings;
10. explain the working principle of a retinoscope; the procedure, recording, and clinical implications of retinoscopic findings;
11. describe the working principle of a keratometer; the procedure, recording, and clinical implications of findings in keratometry; and
12. describe the working principle of an ophthalmoscope; the procedure, recording, and clinical implications of ophthalmoscopic findings.



Course Contents

Clinical techniques used to evaluate the optical properties of the eye; theory and measurement of visual acuity and retinoscopy. An introduction to keratometry, ophthalmoscopy and external examination techniques. Accommodation: Its measurement and relationship to convergence. Ocular deviations: phorias, tropias, and an introduction to their measurement.

OPT 313: General Pathology

(1 Unit C: LH 15)

Learning Outcomes

At the end of OPT 313 (General Pathology) course, students should be able to:

1. explain the concept of pathology and its subdivisions;
2. discuss the normal cell structure, the plasma coat, cytoplasm, and cell organelles;
3. describe fundamental pathological processes such as cellular reactions and adaptations;
4. discuss the anomalies of cellular functions and human immunology;
5. describe cell injury and cell death, the causes, cellular swelling, cell necrosis and its types;
6. describe inflammation and repair processes, including exudates, fluid and hemodynamic derangements; and
7. discuss genetic disorders and systemic implications.

Course Contents

Introduction to pathology and its subdivisions. The normal cell; the plasma cell coat; cytoplasm and its organelles; the nucleus. Fundamental pathological processes. Cellular adaptation: atrophy, hypertrophy, hyperplasia, metaplasia, hypoplasia, dysplasia, agenesis, and aplasia. Anomalies of cellular functions and human immunology. Cell injury and cell death: causes, cellular swelling, cell necrosis and types, somatic death, signs of death, cadaveric changes, intracellular accumulations, hyaline change, and cellular aging. Inflammation and Repair. Exudates. Healing and repair. Fluid and hemodynamic derangements. Genetic disorders and systemic implications. Infectious diseases. Disorders of organ systems.

OPT 315: Optometric Ethics and Jurisprudence

(1 Unit C: LH 15)

Learning Outcomes

By the end of OPT 315 (Optometric Ethics and Jurisprudence) course, students should be able to:

1. appreciate and be able to explain the importance of health care ethics, in relation to the practice of optometry;
2. explain the concept of consent and informed consent in relation to health care treatment, particularly to the practice of optometry;
3. explain the significance of the tort of trespass to the person (assault, battery and false imprisonment) in relation to health care practitioners, and why the law makes it actionable;
4. analyse the principles underlying the law on medical negligence in relation to optometrists;
5. explain the defences available to an optometrist in legal action for trespass to the person of his patient and for practice negligence;
6. state the ethics and the legal implications of optometry practice location, in relation to fellow practitioner and/or other health care providers; and
7. state the roles of associations and agencies involved in the education and practice of optometry.



Course Contents

Knowledge of optometry as an ethically guided profession and its relationship with other associated health-care professions including ophthalmology and opticianary. The function and scope of the optometrist and other vision-care professionals at present and in the future. Legal recognition of optometry and the role of professional organisations; The national code of ethics for Nigeria; Codes of the Nigerian Optometric Association; Optometrists and Dispensing Opticians Registration Board of Nigeria; World Council of Optometry; Association of African Optometric Educators. Road to legal recognition; Code of ethics and in-depth study of the Optometry Practice Law in Nigeria. Scope of modern Optometric practice and survey of its development worldwide. Jurisprudence and Legal requirements in the practice of Optometry: Rules of professional conduct; Basic concept of ethics and ethical issues in the practice of Optometry; The Optometrist in court and the requirements of expert evidence. Concept of developing a personal philosophy of Optometry.

OPT 316: Physiological Optics II

(1 Unit C: LH 15)

Learning Outcomes

At the end of OPT 316 (Physiological Optics II) course, students should be able to:

1. describe the basic electrical activities associated with the extraocular muscles and their nerve supply;
2. identify the contribution(s) of the various extraocular muscles to the optics of the eye with respect to their origins, insertions, and actions;
3. explain the physiology behind the optical changes that occurs during accommodation;
4. explain the role of vergence movements in the optics of the eye and the different components of vergence;
5. explain the relationship between accommodation and convergence in the form of the AC/A ratio;
6. explain the role of versional movements in the optics of the eye and the different forms of version movement;
7. describe retinal disparity and the effects it has on the optics of the eye;
8. describe fusion and the effects it has on the optics of the eye;
9. describe the different forms of fixation pattern and their effects on the optics of the eye;
10. explain all that is involved in binocular coordination; and
11. describe the Horopter, Panum's Fusional Area, Phoria, and Tropia.

Course Contents

The extra-ocular muscles, their electrophysiology, actions, and innervation. Accommodation, convergence, the AC/A ratio and binocular co-ordination. Fusion, fusional vergence, retinal disparities and the horopter. Laboratory work is included.



OPT 318: Ocular Genetics and Molecular Biology

(1 Unit C: LH 15)

Learning Outcomes

At the end of OPT 318 (Ocular Genetics and Molecular Biology) course, students should be able to:

1. define genetics and explain Mendelian genetics in particular;
2. discuss the process of linkage and mapping;
3. explain the nucleic acids, the concept of replication and mutation in relation to abnormalities of human eye;
4. describe genetic code and protein synthesis;
5. describe principle of genetic engineering;
6. discuss gene regulation in bacteria and viruses, and implications for human health conditions and diseases; and
7. discuss the pattern and control of inherited diseases.

Course Contents

Introduction to genetics. Mendelian genetics. Linkage and mapping. Nucleic acids. Replication and mutation in relation to ocular structures. The genetic code and protein synthesis as related to the eye and vision. Genetic engineering. Gene regulation in bacteria and viruses. Implications for human health conditions and diseases are reviewed. Inherited diseases; their pattern and control.

OPT 322: Ocular Neurophysiology

(2 Units C: LH 30)

Learning Outcomes

At the end of OPT 322 (Ocular Neurophysiology) course, the students should be able to:

1. describe the parts of the brain responsible for vision;
2. identify several disorders relating lesions of the visual pathways;
3. Identify the mechanisms responsible for different kinds of visual outputs;
4. discuss neurophysiological and clinical assessments of visual function;
5. discuss neurophysiological and clinical aspect of edinger wesphal nucleus;
6. be acquainted with recent advances in the researches related to visual functions;
7. explain the effects of cortical and tectal lesions on eye movements;
8. discuss the clinical implications of visual evoked potential (VER) and electroretinogram (ERG); and
9. discuss the basic physiology, functions, and clinical correlates of the cerebral cortex (including Brodmann's areas), limbic system, cerebellum and cranial nerves; and also, the physiological basis and importance of pupillary light reflex and accommodation-convergence reflex.

Course Contents

Detailed function of central nervous system and its relationship with ocular structures and vision. Neurophysiology of retina; physiology and functions of the suprachiasmatic system; ganglion cell, optic nerve, lateral geniculate body, visual cortex, forebrain, superior colliculus, pre-tectal and tectal regions, cerebellum, vestibular system, inferior colliculus. Brodmann and the 'V' classifications of the brain. Functional mappings in the brain like colour, memory and many others. Electroretinogram (ERG); electrophysiology of the visual system: Centre-Surround configuration; transient and sustained cells, X,Y,W categories; Boycott and Dowling Schema; pre-colliculus and superior Colliculus features; Tectal Oculomotor control; Lateral geniculate physiology; striate and



pre-striate cortex (in cat and monkey); Visual input to parietal and temporal lobes; the limbic system and prefrontal cortex; effects of cortical and tectal lesions and eye movements; Clinical implications of visual evoked potential (VER) and Electroretinogram (ERG).

OPT 324: General Pharmacology

(1 Unit C: LH 15)

Learning Outcomes

At the end of OPT 324 (General Pharmacology) course, students should be able to:

1. define pharmacology in its basic and simple form;
2. explain the meaning of pharmacokinetics and pharmacodynamics;
3. explain all the processes involved in the pharmacokinetics of drugs and identify the factors that can influence each of the processes;
4. explain all the processes involved in the pharmacodynamic of drugs and identify the factors that can influence each of the processes;
5. describe the basic mechanisms of drugs actions;
6. explain the concepts involved in drug-receptor interactions;
7. identify and explain the different types of dose-response relationships;
8. describe the autonomic nervous system and identify drugs that have effect(s) on this system;
9. identify the different classes of anti-inflammatory drugs with specific examples;
10. understand the concept of on the counter (OTC) and prescription drugs; and
11. Identify the different classes of chemotherapy agents with specific examples.

Course Contents

General principles of pharmacology. Definition of basic concepts in pharmacology: pharmacy, pharmacognosy, pharmacotherapeutics, toxicology and many others. Drug administration: methods and absorption of drugs; distribution; biotransformation and excretion of drugs. Drug receptor interaction; dose - response relationship. Fate of systemically administered drugs. Autonomic nervous system pharmacology: principles and classification of autonomic drugs; Anti-inflammatory drugs; Chemotherapy agents. Action of drugs, factors influencing it. Compatibility and incompatibility, tolerance, tachyphylaxis, potentiation, synergism, additive, antagonism and many others.

OPT 326: Ocular Microbiology

(2 Units C: LH 15; PH 45)

Learning Outcomes

At the end of OPT 326 (Ocular Microbiology) course, the students should be able to:

1. discuss the origin and different kinds of infections;
2. identify different form of infections that may affect the body system, particularly the eye, its adnexa vestibular and oculo-visual systems;
3. apply the acquired knowledge in microbiology to insulate optometry patients from cross infections in the clinic;
4. discuss the classification of bacteria (gram-positive and gram-negative);
5. describe the characteristics and structure of bacteria;
6. describe the normal flora and microbiota of the human eye;
7. analyse microscopic culture and sensitivity tests for microorganisms implicated in ocular infections;
8. state the characteristics of viruses and fungi that infect the eye;
9. explain the concept of host-parasite relationship;



10. discuss the effect of antibiotics, antiviral and antifungal preparations on bacteria, viruses and fungi;
11. refer to appropriate corollary and other health professionals such as ophthalmologist, family doctor, a neurologist on any infections that may require medical/surgical attention; and
12. apply the acquired knowledge by listing out the needed steps for infection control in an Optometry clinic setting.

Course Contents

Scope of microbiology, historical approach to infections and its control, classifications and nomenclature of microorganisms. Introduction to the microbial world, introduction to bacteriology, mycology, virology and parasitology (the protozoans); disinfection and sterilization; natural and acquired resistance to infection; determination of innate immunity; deep/superficial tissue infections; fungal infections: deep and systemic mycosis, perichondral/cartilaginous/osseous infections; hospital associated infections. Microscopy; growth and nutrition of bacteria. Classification of bacteria (Gram-positive and Gram-negative). Characteristics and structure of bacteria. Normal flora and microbiota of the human eye. The microscopic culture and sensitivity tests for microorganisms (bacteria) implicated in ocular infections. Characteristics of viruses and fungi that infect the eye. Host-parasite relationship; chemotherapeutic agents – the effect of antibiotics, antiviral and antifungal preparations on bacteria, viruses and fungi.

400 Level

OPT 401: Physiological Optics Laboratory II

(1 Unit C: PH 45)

Learning Outcomes

At the end of OPT 401 (Physiological Optics Laboratory II) course, students should be able to:

1. describe the Pulfrich phenomenon in vision processes;
2. explain the concept of Pastpointing, Pre-adaptation;
3. explain the concept of normal colour vision perception;
4. explain the concept of fixation disparity, convergence, and the AC/A ratio; and
5. explain the principles involved in optical illusions holography, entoptic phenomenon and horopter.

Course Contents

Pulfrich phenomenon. colour vision tests. dark adaptation theory and Lab. fixation disparity. Optical illusions experiment. Horopter. leaf room. Holography. tests of stereopsis. visual threshold experiments. entoptic phenomenon.



OPT 402: Clinical and Mechanical Optics I

(2 Units C: LH 15; PH 45)

Learning Outcomes

At the end of OPT 402 (Clinical and Mechanical Optics I) course, the students should be able to:

1. discuss the process of manufacturing ophthalmic lenses;
2. discuss lens surfacing, polishing and glazing techniques;
3. discuss the principle of grinding of prismatic and cylindrical lenses;
4. describe the process of edging, and insertion of lenses into frame;.
5. Discuss the front bench spectacle works and job verification;
6. conduct facial measurement and selection based on frame sizes/shape;
7. demonstrate format, and marking / placement of optical centres, particularly in bifocals and multifocal lenses;
8. describe spectacle adjustments and repairs; and
9. discuss manufacture of contact lenses and ocular prosthesis.

Course Contents

Ophthalmic lens manufacture; Lens surfacing, polishing and glazing techniques; Grinding of prismatic and cylindrical lenses. Edging, insertion of lenses into frames. Front bench spectacle works and verification; patient fitting; ophthalmic frames, facial measurement and selection based on frame sizes. Format making; marking and placement of optical centres; bifocals and multifocal segments. Spectacle adjustments and repairs. Manufacture of contact lenses and ocular prosthesis. Laboratory sessions are included.

OPT 403: General Optometry Laboratory

(1 Unit C: PH 45)

Learning Outcomes

At the end of OPT 403 (General Optometry Laboratory) course, the students should be able to:

1. describe the procedure involved in assessment of patient's case history and then be able to carry out the procedure on selected patients;
2. describe the procedure involved in assessment of visual acuity and then be able to carry out the procedure on selected patients;
3. describe the procedure involved in basic external penlight examination of patients and then be able to carry out the procedure on selected patients;
4. describe the procedure involved in direct ophthalmoscopy assessment of patients and then be able to carry out the procedure on selected patients;
5. describe the procedure involved in the use of binocular indirect ophthalmoscope for patients' examination and then be able to carry out the procedure on selected patients;
6. describe the procedure involved in retinoscopic objective refraction and then be able to carry out the procedure on selected patients;
7. describe the basic procedure involved in keratometry and then be able to carry out the procedure on selected patients;
8. describe the procedure involved in patient subjective refraction and then be able to carry out the procedure on selected patients;
9. state the procedure involved in lensometry and then be able to carry out the procedure to determine the type, power, and axis of unknown lenses;
10. state the basic procedure involved in the use of a slit-lamp biomicroscopy in patients' examination and then be able to carry out the procedure on selected patients;



11. state the procedure involved in gonioscopy and then be able to carry out the procedure on selected patients;
12. describe the basic procedures associated with the different types of tonometry used in involved in assessing intraocular pressure and then be able to carry out the different procedures on selected patients;
13. describe the procedures involved in the different types of perimetry used in assessing patients' visual field and then be able to carry out the procedures on selected patients; and
14. state basic information and steps used in patients' case analysis and then be able to do a case analysis on selected patients record files in order to arrive at diagnosis and management plan.

Course Contents

Techniques learnt in OPT 407 and general optometry courses are practised and developed preparatory to examining patients.

OPT 405: Physiological Optics III

(2 Units C: LH 15; PH 45)

Learning Outcomes

At the end of OPT 405 (Physiological Optics III) course, the students should be able to:

1. identify the steps involved in sensory vision;
2. describe the basic biochemical reactions/activities involved in vision processes;
3. explain the concept of visual thresholds and visual adaptation in relation to visual processing;
4. explain the processes involved in the perception of colours;
5. identify all the colour vision defects, their significance, and how they can be detected;
6. explain the principle involved in various colour vision tests and how to carry out the tests;
7. explain the basic electrical activities taking place in the retina and the visual pathway during visual processing;
8. discuss the physiology behind selected visual phenomena;
9. identify the various electrophysiological techniques and their applications; and
10. explain the concept of optical illusions, examples, and demonstration of each.

Course Contents

The photochemistry of vision. Sensory aspects of vision; thresholds and adaptation. The mechanisms of colour vision; colour vision defects, their detection and significance. Electrophysiology of the retina and visual pathway. Laboratory work is included.

OPT 406: Ocular Pathology I

(2 Units C: LH 30)

Learning Outcomes

At the end of OPT 406 (Ocular Pathology I) course, the students should be able to:

1. describe the clinical presentations and management plan of the different disorders of the iris;
2. explain the clinical presentations and management plan of the different disorders of the ciliary body;
3. explain the clinical presentations and management plan of the different disorders of the lens;
4. describe the clinical presentations and management plan of the different disorders of the choroid;



5. explain the clinical presentations and management plan of the different disorders of the vitreous;
6. explain the clinical presentations and management plan of the different disorders of the retina and optic nerve;
7. discuss the pathogenesis and pathophysiology of glaucoma;
8. pinpoint the differential diagnosis of posterior segment disorders that have similar and overlapping presentations;
9. identify the ocular manifestations of common systemic diseases; and
10. identify the various ocular emergencies and the management plan for each.

Course Contents

Diseases of the iris, ciliary body, lens, choroid, glaucoma, vitreous; retina and optic nerve disorders: Their sign and symptoms, clinical presentations, pathophysiology, detection, diagnosis and management. Differential diagnosis and management of posterior segment disorders. Oculo-systemic diseases. Ocular emergencies. Clinical demonstration is included.

OPT 407: General Optometry III

(1 Unit C: LH 15)

Learning Outcomes

At the end of OPT 407 (General Optometry III) course, the students should be able to:

1. describe the principle, procedure, recording, and significance of findings of the different types of clinical visual acuity assessment methods;
2. describe the principle, procedure, recording, and significance of findings of cover test; version test; vergence test; fusion test; and near point of convergence test;
3. describe the principle/theory, procedure, recording, and significance of findings in keratometry and retinoscopy (static and dynamic);
4. describe the principle and steps involved in subjective refraction (distance and near); measurement of amplitude of accommodation; determination of near addition; and photometry;
5. state the principle and steps involved in graphical analysis;
6. describe the principle and steps involved in Von-Graefe phoria assessment; prism vergence tests; monocular and binocular balancing; fogging; fan-dial test; and monocular cross cylinder test; and
7. state the principle and steps involved in disparometry and polaroid tests.

Course Contents

The optometric examination: visual acuities, cover testing, test of versions and vergences, near point of convergence, fusion test and keratometry. Techniques of photometry Von Graefe phoria testing and prism vergence testing. Static and dynamic retinoscopy subjective sight testing, fogging, fan-dial, monocular cross cylinder, monocular and binocular balancing. Methods of measuring amplitude of accommodation and determining the near addition.



OPT 409: Ocular Pathology II

(1 Unit C: LH 15)

Learning Outcomes

At the end of OPT 409 (Ocular Pathology II) course, the students should be able to:

1. describe and classify ocular disease processes;
2. explain the mechanism of ocular pathology such as eyelid diseases and diseases of ocular adnexa;
3. describe clinical presentation of different ocular adnexa diseases;
4. discuss differential diagnosis of anterior segment disorders; and
5. discuss the management anterior eyes segment disorders.

Course Contents

Classification of ocular disease processes; mechanism of ocular pathology. Disease of eyelid and adnexa. Patho-physiology, detection, diagnosis and management of anterior segment disorders: Tear film, conjunctiva, cornea, episclera and sclera; their signs and symptoms, clinical presentations. Differential diagnosis of anterior segment disorders. Clinical demonstration is included.

OPT 410: Endocrinology and Nutrition

(1 Unit C: LH 15)

Learning Outcomes

At the end of OPT 410 (Endocrinology and Nutrition), the students should be able to:

1. state different types of hormones that are produced in the body and the tissues and organs that produce the hormones;
2. describe how hormones work (i.e. mechanism of action of hormones) and different ways by which hormones can be assayed;
3. explain the effect of some endocrine pathologies on vision;
4. discuss the importance of different types of nutritional constituents, especially vitamins and trace elements on vision;
5. discuss the impact of nutritional deficiency and excess nourishment on vision; and
6. offer necessary dietary advice for better nutrition and vision.

Course Contents

Basic human endocrine systems, their general functions, modes of action, regulation and transport. Metabolic disturbances related to dietary deficiencies and excesses.

OPT 411: Ocular Pharmacology

(1 Unit C: LH 15)

Learning Outcomes

At the end of the OPT 411 (Ocular Pharmacology) course, students should be able to:

1. discuss concept needed in writing and interpreting drug prescription;
2. describe the unique features of the ocular tissues that impact the pharmacokinetics and pharmacodynamics of drugs;
3. identify the different classes of ophthalmic drugs with examples, mechanism of action, indication(s), side/adverse effects, and dosing;
4. identify ocular manifestations of the side/adverse effects of systemically administered drugs;
5. discuss basic principles and precautions in the use of ophthalmic diagnostic drugs



6. describe route of administration of ophthalmic drugs and the different formulations of ophthalmic drugs; and
7. state basic concept of prescription writing and ophthalmic medications.

Course Contents

Principles of ocular pharmacology and prescription writing. Adrenergic: agonist and antagonist. Cholinergic: agonist and antagonist. Anti-glaucoma drugs. Ocular (topical/local) anesthetics. Choice and administration of diagnostic and prophylactic ophthalmic drugs. Anti-allergic drugs; Anti-inflammatory drugs; Anti-infective preparations. Optometric examinations using diagnostic aids. Examination under drugs: interpretation and allowances. Precautions and adverse effects from use of ophthalmic drugs. Therapeutics Clinical work is included.

OPT 412: General Optometry IV

(1 Unit C: LH 15)

Learning Outcomes

At the end of the OPT 412 (General Optometry IV) course, students should be able to:

1. discuss principles of effective case history; case analysis; graphical analysis; diagnosis and prognosis in patients' management;
2. discuss procedure involved in clinical assessment of accommodation and convergence, and their clinical relationship;
3. define ocular deviations, and the procedure involved in their clinical measurements;
4. discuss the principle, procedure, recording, and clinical implications of findings as regard the different techniques/devices used in assessing intraocular pressure (tonometry);
5. discuss the principle, procedure, recording, and clinical implications of findings of slit-lamp biomicroscopy; direct and indirect ophthalmoscopy; gonioscopy; perimetry; and sphygmomanometry;
6. describe skills in lensometry / focimetry; and
7. discuss the principle, procedure, recording, and clinical implications of findings of the different colour vision test devices.

Course Contents

A continuation of OPT 407. The case history and its relationship to optometric examination; the integration of individual findings. Visual analysis, graphical analysis, diagnosis, prognosis and therapy. Introduction to specialised techniques such as tonometry, ophthalmoscopy, lensometry, biomicroscopy, stereoacuity testing, gonioscopy perimetry, colour vision testing and sphygmomanometry.

OPT 413: Contact Lenses I

(2 Units C: LH 30)

Learning Outcomes

At the end of OPT 413 (Contact Lenses I) course, the students should be able to:

1. discuss the history of the development of contact lenses;
2. appreciate the trends of current usage of contact lenses;
3. describe insertion and removal of rigid and soft contact lenses
4. discuss fitting of rigid and soft contact lenses;
5. discuss the approach to aftercare of contact lens patients;
6. discuss the physiological basis of contact lens wear;
7. appreciate alternative contact lens options;



8. devise solutions to contact lens problems;
9. comprehend the significance of new developments in the contact lens field;
10. confidently handle contact lens patients/cases;
11. insert and remove rigid and soft contact lenses;
12. undertake preliminary measurements for rigid and soft contact lens fitting;
13. use the slit lamp biomicroscope and keratometer for contact lens fitting purpose;
14. evaluate the fit of rigid and soft contact lenses;
15. carry out an over-refraction with rigid and soft contact lenses; and
16. explain contact lens related technological issues to patients.

Course Contents

History and development of contact lenses. Physico-chemical and mechanical properties of contact lens materials. Optical and mathematical concepts. The anatomical implications of, and physiological response to contact lens wear. Patient selection: Indications and contraindications for contact lens wear. Contact Lens selection and designs/types. Basic fitting techniques for hydrogel soft contact lenses. Care and maintenance of contact lenses. Assessing success of contact lens therapy.

OPT 414: Contact Lenses II

(2 Units C: LH 15; PH 45)

Learning Outcomes

At the end of OPT 414 (Contact Lenses II) course, the students should be able to:

1. differentiate and demonstrate the ability to fit different types of rigid gas permeable (hard) contact lenses;
2. describe different types of contact lens modifications;
3. describe systemic diseases that can effect contact lens wear;
4. demonstrate the ability to perform advanced fitting of contact lenses;
5. demonstrate the ability to fit contact lenses for specific needs;
6. describe the knowledge of orthokeratology and its applications;
7. describe the knowledge of refractive surgery and its implications to contact lenses;
8. identify the trends in contact lenses development;
9. identify different types and brands available in the market;
10. explain the steps involved for contact lens pre-fitting examinations;
11. describe the basic concept of contact lens selection;
12. describe the concept of inspecting and verifying contact lens parameters;
13. explain the concept of contact lens insertion and removal;
14. discuss the evaluation of contact lens fit;
15. describe modification of hard rigid gas permeable (RGP) lens;
16. write contact lens parameters / specifications and order the lens; and
17. explain the concept of checking before dispensing contact lenses.



Course Contents

A continuation of OPT 413. Comparison between soft and rigid gas permeable contact lenses. Fitting techniques for rigid gas permeable contact lenses. Detection and management of chronic and acute complications induced by contact lenses. Advanced fitting techniques for toric and bi-toric lenses. Contact lens management options for special conditions such as dry eye, aphakia and keratoconus (and other corneal irregularities). Scleral lenses. Disposable lenses and replacement regimes. Monitoring contact lens wearers and fitting presbyopic patients. Alternative management of refractive errors such as orthokeratology and refractive surgery. Laboratory sessions include pre-fitting examination, contact lens selection and fitting, evaluation of fit, insertion and removal. Lens inspection and verification. Lens modification (Hard or rigid gas permeable lens) ordering and dispensing.

OPT 415: Optometric Instrumentation

(1 Unit C: PH 45)

Learning Outcomes

At the end of OPT 415 (Optometric Instrumentation) course, the students should be able to:

1. describe the operations, maintenance, and basic repairs of a lensmeter / focimeter;
2. describe the operations, maintenance, and basic repairs of an ophthalmoscope;
3. describe the operations, maintenance, and basic repairs of a retinoscope;
4. describe the operations, maintenance, and basic repairs of a slit-lamp biomicroscope;
5. describe the operations, maintenance, and basic repairs of tonometers;
6. describe the operations, maintenance, and basic repairs of a keratometer;
7. explain the operations and maintenance of a visual acuity unit;
8. discuss the operations and maintenance of a trial set;
9. discuss the operations and maintenance of a phoropter;
10. explain the operations and maintenance of a perimeter; and
11. explain the operations and maintenance of a synoptophore.

Course Contents

Description of the principles behind the operation of optometric / ophthalmic instruments; Principle of design, basic maintenance and repairs of common Optometric instruments. Advances in Optometry instrumentation.

OPT 416: Physiological Optics IV

(1 Unit C: LH 15)

Learning Outcomes

At the end of the OPT 416 (Physiological Optics IV) course, students should be able to:

1. identify the mechanisms involved in the visual perceptions of distance and depth;
2. describe the mechanisms involved in the visual perceptions of direction of an object in space;
3. discuss the mechanisms involved in the visual perceptions of the size of an object in space;
4. describe the mechanisms involved in the visual perceptions of the shape of an object in space;
5. describe the mechanisms involved in the visual perceptions of the motion of an object in space;
6. differentiate the optics and physiology behind optical illusions and entoptic phenomena, as well as their clinical significance and application; and
7. conduct laboratory demonstration of entoptic phenomena and optical illusions.

Course Contents



The perception of depth, direction, size, shape, distance, motion and time through the visual medium. Optical illusions and entoptic phenomena; their causes and significance to the visual system. Laboratory work is included.

OPT 417: Epidemiology

(1 Unit C: LH 15)

Learning Outcomes

At the end of the Epidemiology course, student should be able to:

1. discuss the definition and basic tenets of epidemiology;
2. discuss the concept of disease, health, disease prevention, and population at risk;
3. conduct research on natural history of disease and epidemiologic model of disease occurrence;
4. explain the epidemiology of ocular diseases;
5. describe disease occurrence in populations in terms of person-time-place model;
6. describe disease occurrence in populations in terms of agent-host-environment model;
7. explain epidemiologic measures of risk of disease in a population such as incidence rate, prevalent rate, relative risk ratio, attributable risk and many others;
8. discuss the principles of screening in disease control and surveillance;
9. describe different study designs in epidemiology and morbidity survey such as case control, cohort study, clinical trials and many others;
10. engage in activities towards community support for eye care;
11. engage in decision analysis and clinical decision making in relation to epidemiological data; and
12. apply biostatistical techniques in epidemiology in relation to Optometry and vision science.

Course Contents

General epidemiologic concepts: Principles and methods of epidemiology. Distribution and dynamics of diseases; description and application of the descriptive epidemiological models of person-time-place, and agent-host-environment relationships with respect to specific diseases. Description of natural history of disease and the epidemiologic methods for prevention and control. Definition and application of epidemiological measures of risks in a population. The concept and practice of screening, and disease surveillance in the control and prevention of diseases. Basic principles and techniques of morbidity surveys, retrospective (case-control) and prospective (cohort) studies. Infectious disease epidemiology. Application of epidemiological principles and methods in decision analysis and clinical decision. Application of basic biostatistical techniques in epidemiology



OPT 418: Environmental Vision

(1 Unit C: LH 15)

Learning Outcomes

At the end of OPT 418 (Environmental Vision), student should be able to:

1. assess the impacts of various environmental conditions on the visual system;
2. assess the visual demands associated with different occupations;
3. identify the basic ocular protective devices and their specification in relation to specific industries;
4. identify the basic requirements in setting up occupational visual programme in industries;
5. identify different ocular hazards and the approaches to prevention;
6. identify common ocular injuries and management options;
7. acquired the basic necessary skill and knowledge to be able to serve as a resource person in industrial visual safety; and
8. identify the visual demands and the visual skills needed in different sports/driving/specialised environments or occupations.

Course Contents

Biophysics of radiation and illumination. Protection against radiation and other hazards. Role of Optometry in health care systems. Introduction to environmental Optometry. Vision screening. Occupational Optometry (Visual efficiency; Eye protection programmes in industry). Chemical injuries to external eye structures and First aid care. Lighting strategies (Evaluation and design of Lighting). Visual ergonomics in the workplace; Adaptation of vision to specific vocational needs: testing devices, analytical and demonstrative techniques in vocational prescribing. Visual requirements for driving (Vision and highway/transportation safety). Vision through the atmosphere; Problems of vision under water; Human factors in the solution to visual problems.

OPT 419: Functional Optometry

(1 Unit C: LH 15)

Learning Outcomes

At the end of the OPT 419 (Functional Optometry) course, the students should be able to:

1. discuss the role of visual process in human behaviour; and
2. explain visual case analysis using Optometry extension programme techniques.

Course Contents

Analytical methods in evaluating Optometric data using 21-step eye examination approach. Optometry extension programme (OEP) methods. Case analysis of the OEP techniques.

OPT 420: Strabismus and Amblyopia

(2 Units C: LH 15; PH 45)

Learning Outcomes

At the end of the OPT 420 (Strabismus and Amblyopia), students should be able to:

1. identify the basic prerequisite for normal binocular vision;
2. identify the higher centres involved in binocular vision and the function of each centres;
3. identify the various causes of strabismus and amblyopia;
4. explain the basic classification of strabismus;
5. identify the different types of strabismus and their management options;
6. state the basic classification of amblyopia, explain the clinical characteristics of each and the management options;



7. identify all the adaptive conditions associated with ocular deviations, describe the tests for each adaptive condition and the treatment options; and
8. describe devices used in assessing strabismic and amblyopic patients.

Course Contents

Overview of requisites for normal binocular vision. Incidence and classification of strabismus and amblyopia. Neuro-physiological basis for binocular vision. Causes of strabismus and amblyopia. Adaptive conditions commonly associated with strabismus. Clinical characteristics of eyes with amblyopia. Routine examination of strabismus patients and anisometropic amblyopes. Clinical work is included. Techniques learned in theory lectures are practiced with basic instrumentation.

OPT 422: Scientific Research Methodology

(2 Units C: LH 30)

Learning Outcomes

At the end of the Scientific Research Methodology course, students should be able to:

1. state the importance of scientific research;
2. describe basic principles of scientific research and their applications;
3. identify sources and how to source relevant materials for a research idea;
4. identify and devise means of solving common health problems through research;
5. conduct, present and defend research findings in conventional manners;
6. state steps involved in developing a research project;
7. identify a problem and develop a study on the problem;
8. conduct literature search/survey to write a background knowledge of what is in the literature about research problem;
9. brainstorm and come up with the appropriate study design to address the problem;
10. demonstrate how to write null and alternative hypothesis;
11. determine relevant statistic tests to use for data analysis;
12. apply probability distribution and analysis of variance;
13. describe the process of data sampling;
14. analyse continuous and categorical data;
15. use of computer software (such as graphics using SPSS, SAS, and EXCEL spread sheet) to aid in the collection, collation and analysis of data; and
16. write research report from data.

Course Contents

Introduction to the basic principles of scientific research. Literature search and review of current literature. Conceptualisation and definition of research problems. Experimental design; project planning; work plan and budget; Data collection; data analysis; review of statistical methods; interpretation of results; conclusion and referencing. Format for project write-up. Preparation / seminar write-up and presentation of data as oral and poster on selected research topic.



500 Level

OPT 501: Clinical and Mechanical Optics II

(1 Unit C: PH 45)

Learning Outcomes

At the end of OPT 501 course, the students should be able to:

1. state difference between ophthalmic and non-ophthalmic frames;
2. explain the concept of patient's facial measurement and frame selection;
3. discuss ophthalmic laboratory job order writing and billing;
4. explain the process of ordering of patient's prescription;
5. discuss front bench dispensing and verification of orders received;
6. describe patients' fitting, adjustment of frames and minor repairs; and
7. explain concept of emergency frame and/or lens repair.

Course Contents

Ophthalmic and non-ophthalmic frames. Posting to optical dispensing and frame display unit to handle patients referred for spectacle dispensing. Patients' facial measurement and frame sizes; frame selection and patients' styling. Placement/positioning of optical centres, bifocals and multifocal segments. Ophthalmic laboratory job order writing and billing; Ordering of the prescription; front bench dispensing and verification of orders received; patients' fitting and adjustment of frames and minor repairs. Emergency frame and/or lens repair. Laboratory work is included.

OPT 503: Primary Optometry Clinic

(2 Units C: PH 90)

Learning Outcomes

At the end of OPT 503 (Primary Optometry Clinic) course, the students should be able to:

1. prepare patients and give them instruction on eye examination;
2. perform routine optometric examination under supervision of an optometrist;
3. examine the posterior segment of the eye with the aid of ophthalmoscope;
4. detect refractive errors using basic retinoscopy; and
5. perform subjective refraction from refining retinoscopy findings.

Course Contents

Examination, diagnosis, and treatment of patients/clients in the optometry clinic under the supervision of an Optometrist. Emphasis is placed on routine optometric examination and detection of refractive errors and any other oculo-visual disorders.

OPT 505: Contact Lens Clinic

(1 Unit C: PH 45)

Learning Outcomes

At the end of OPT 505 (Contact Lens Clinic) course, the students should be able to:

1. carry out prefitting examination on patients and prescribe the appropriate contact lenses;
2. describe the basic concept of contact lens selection to patients;
3. insert and remove of contact lens;
4. explain and teach patient the technique of contact lens insertion and removal;
5. state how to carry out the evaluation of contact lens fit;
6. inspect and verify contact lens parameters;



7. modify rigid gas permeable (RGP) lens;
8. write contact lens parameters / specifications and order the lens;
9. check and dispense contact lens;
10. carry out advanced fitting techniques such as toric and bi-toric lenses;
11. fit keratoconic patients with contact lenses; and
12. examine and fit presbyopic patients with contact lenses.

Course Contents

Examination, diagnosis, and treatment of patients for contact lens wear. Management of contact lens cases using appropriate fitting techniques and care regimen. Advanced fitting techniques; toric and bi-toric lenses, Keratoconic patients. Monitoring Contact lens wear and fitting presbyopic patients.

OPT 507: Specialty Optometry Laboratory

(1 Unit C: PH 45)

Learning Outcomes

At the end of the Specialty Optometry Lab course, student should be able to:

1. determine the procedure to use for managing a particular ocular disorder;
2. explain normal childhood development in relation to visual function;
3. determine type of therapy for pediatric visual disorder;
4. determine the treatment protocol for geriatric oculo-visual conditions;
5. apply orthoptic therapy appropriately as needed;
6. develop basic skills in the use of special equipment such as synoptophore in managing binocular vision anomalies; and
7. acquired basic knowledge in the use of special ophthalmic equipment for diagnosis and management of ocular conditions.

Course Contents

Laboratory exercises in Orthoptics, Geriatric, Paediatric Clinics. Use of instruments and techniques in these fields.

OPT 509: Paediatric Optometry

(1 Unit C: LH 15)

Learning Outcomes

At the end of the Paediatric Optometry course, student should be able to:

1. explain the development of basic visual anatomy and visual function;
2. explain normal development of the child;
3. explain theories of normal child visual spatial development;
4. discuss anomalous development and pathologies present in children;
5. discuss practical applications of concepts of optometry for clinical usage in paediatric population;
6. identify diagnostic procedures that are applicable for children from birth to five years;
7. perform and adapt diagnostic ophthalmic procedures specific to examining children from birth to five years;
8. develop and adapt a management plan to be specific to visual anomalies of children;
9. clinically interact with infant, toddler and paediatric patients;
10. manage visual problems of children from birth to five years;
11. educate the caregiver on home programme for challenged children; and



12. educate caregiver on the importance of infection control and follow-up of treatment.

Course Contents

A review of the development of vision and the distribution of refractive errors among infants, common congenital disorders, clinical assessment procedures for the young patient (birth through elementary school), identification of learning disorders and recommendation of appropriate remedial programme. Clinical work is included.

OPT 511: Low Vision and Rehabilitative Optometry (2 Units C: LH 15; PH 45)

Learning Outcomes

At the end of OPT 511 (Low Vision and Rehabilitative Optometry) course, the students should be able to:

1. explain/describe the basic principle and features of low vision, visual impairment, and blindness;
2. discuss psychological, sociological, and vocational impacts/implication of low vision, visual impairment, and blindness;
3. exhibit basic knowledge and skills in the assessment, prognosis, and management of low vision/visual impairment cases;
4. exhibit basic knowledge relating to the science of various low vision aids/devices and the guidelines used in prescribing them in clinical setting;
5. explain what rehabilitation is/involves;
6. exhibit basic knowledge and skills needed for visual rehabilitation;
7. describe the multidisciplinary approaches to visual rehabilitation;
8. carry out proper assessment and management plan for cases requiring the use of ocular prosthesis; and
9. exhibit basic knowledge and skills in the handling of various instrument used in examining low vision / visual impairment patients.

Course Contents

Principles of low vision; magnification, telescopic systems. microscopic systems and magnifiers. The definition and aetiology of low vision. Prognosis and management; illumination control, optical and non-optical aids. Ocular prostheses. Aniseikonia.

OPT 513: Optometric Practice Management (1 Unit C: LH 15)

Learning Outcomes

At the end of OPT 513 (Optometric Practice Management) course, the students should be able to:

1. discuss the scope and various modes of management practices in single or privately owned hospital or clinic, partnership or group and as well understand the principles of management practice while they were employed as optometrist in the hospitals owned by government or an industry;
2. develop and manage optometric practices with the idea of location and layout of office establishment for the purpose of optometric operation;
3. develop and gained much knowledge on how to manage relationship with individuals, groups or peers internally and externally in relation to professional and outside world; and



4. appreciate the role and functions of the key stakeholders which include an optometrist, Optometrists and Dispensing Opticians' Registration Board of Nigeria for proper policy documentation on unethical business practices and secure license for security that is in line with the operation of optometrist practices.

Course Contents

The scope and various modes of practice; single/solo, partnership, group practice, employed practice in hospitals, government and industry. The development and management of an optometric practice. Office location and layout. The development of inter-and intra-professional relationships. Role and function of key stakeholders including Optometrists and Dispensing Opticians Registration Board of Nigeria and many others. Policy document on unethical business practices.

OPT 515: Orthoptics

(2 Units C: LH 15; PH 45)

Learning Outcomes

At the end of the Orthoptics course, students should be able to:

1. explain/describe the basic characteristics of binocular vision anomalies of both the strabismus and non-strabismus patient;
2. explain the basic treatment of problem of convergence and divergence, accommodation, fusional reserves;
3. discuss detection, measurement and treatment of strabismus, eccentric, fixation, and micro-strabismus; and
4. conduct prognosis for a functional or cosmetic cure of binocular vision anomalies.

Course Contents

An introduction to the binocular vision anomalies of both the strabismus and non-strabismus patient. The treatment of problem of convergence and divergence, accommodation, fusional reserves. The detection, measurement and treatment of strabismus, eccentric, fixation, micro-strabismus and many others. The prognosis for a functional or cosmetic cure of binocular vision anomalies.

OPT 517: Geriatric Optometry

(1 Unit C: LH 15)

Learning Outcomes

At the end of the Geriatric Optometry course, student will be able to:

1. explain the concept of geriatric eye care;
2. discuss the psychological, physiological, social and ocular problems of the elderly;
3. discuss the special ocular-visual problems of concern to the elderly patient;
4. identify techniques for refraction, binocularity and ocular health assessment of the elderly;
5. explain presbyopia, cataracts, aphakia, visual field losses, low contrast sensitivity and colour vision with respect to the geriatric patient;
6. handle and counsel the elderly patients;
7. discuss the problems of therapy, management and compliance among the elderly patient; and
8. discuss the special problems of the hospitalised and bedridden elderly patients.



Course Contents

Define the geriatric patient. Psychological, physiological, social and ocular problems of the elderly. Techniques for refraction, binocularity and ocular health assessment of the elderly with emphasis on involuntional and pathological changes. Special ocular-visual problems of concern to the elderly patient. Presbyopia, cataracts, aphakia, visual field losses, low contrast sensitivity and colour vision. Handling, counselling the elderly patient. Problems of therapy, management and compliance. Special problems of the hospitalised and bedridden elderly patients. Clinical work is included.

OPT 519: Applied Psychology for Optometrists

(1 Unit C: LH 15)

Learning Outcomes

At the end of the OPT 519 (Applied Psychology for Optometrists) course, the students should be able to:

1. explain the need for a basic understanding of psychology and collaboration with experts in this field;
2. discuss how vision challenges could predispose patients to some social and psychological conditions;
3. describe basic signs and symptoms of psychopathology (such as; anxiety/phobia, depression, PTSD, stigma, cognitive dissonance and many others.) that could interact or mediate with the treatment outcomes in the optometric clinical setting;
4. utilise psychological knowledge to detect psychopathology in an optometric patient/setting and therefore, use this basic knowledge to help them or make a referral when necessary, using collaborative skills;
5. demonstrate basic techniques of clinician-client relationships such as; respect for patient opinion, right of patients, and boundaries of both clinician and patients in the treatment process; and
6. develop skills that could guide optometric clinicians on how to reduce patients' fear, pain, and non-adherence to treatment; and be able to communicate effectively with patients to optimise the patient-clinician relationship, breaking bad news appropriately, patient care, and the maintenance of the psychological well-being of patients, and their loved ones during the optometric treatment process.

Course Contents

Introduction to clinical psychology. Role of behavioural sciences in optometric practice; clinician-patient relationship. Psychopathology; identification and management, crisis intervention. Clinician- patient communication. Suggestion and hypnosis.



OPT 521: Community Optometry Outreach

(1 Unit C: PH 45)

Learning Outcomes

At the end of OPT 521 (Community Optometry Outreach) course, student should be able to:

1. apply the knowledge and skills needed to generate the socio-demographic characteristics of a given community;
2. describe the basic skills in community penetration as a health worker;
3. determine the relationship between the life pattern of inhabitants of a community and the ocular health status of the community;
4. conduct basic visual health examination on the inhabitants of a community under supervision of a qualified clinician;
5. demonstrate skills in effective clinician-patient communication in a community setting under the supervision of a qualified clinician;
6. demonstrate skills in efficient patients' case analysis and patient management plan in a community setting under the supervision of a certified clinician;
7. determine the common eye problems in a community and their possible causes through analysis of data collected from the community; and
8. conduct out eye-health education/promotion in a community under supervision.

Course Contents

Health education, environmental health, occupational health, public health administration/health care. Epidemiology of communicable and non-communicable diseases. Social medicine. National and international regulations relating to health. Student exposure and participation in practical applications of all procedures on real patients in the community (at both rural and urban health centres, geriatric homes and many others), with appropriate case analysis and clarifications with supervising clinicians. Clinician-patient communication is assessed. Each student is evaluated on the subjective, objective, plan and management aspects of community patient care, such as referral. The community Optometry outreach course follows the Community Based Experience and Service (COBES) approach. Emphasis is on rural communities to deliver eye care services and carry out survey of endemic eye and vision problems under WHO (The Right to Sight) Programme. Participation in vision screening programmes for schools, industries. and institutions for the less privileged.

OPT 598: Externship and SIWES

(3 Units C: PH 135)

Learning Outcomes

At the end of the OPT 598 (Externship and SIWES), the students should be able to:

1. demonstrate more confidence in taking case history and attending to patients;
2. improve on how to use retinoscopy for objective refraction;
3. improve on how to perform subjective refraction;
4. explain cup to disk ratio grading with ophthalmoscopy;
5. conduct diagnosis of external eye conditions especially different types of red eye and treatment options;
6. arrive at and write spectacle prescription for patients;
7. order prescription lenses for patients;
8. glaze and mount lenses into ophthalmic frames;
9. check for good finishing of spectacles before dispensing;



10. recognise a wide range of clinical cases which they might not be privileged to come across in the school clinic;
11. identify optometric diagnostic equipment and procedures outside university facility;
12. develop more confidence in clinical practice and mentoring skill;
13. exposed to the business management aspects of optometric practice;
14. demonstrate experience in optical laboratory and dispensing from centres outside the university;
15. display experience in the handling of optometric instrument from centres outside the university;
16. display experience in patients' management/handling from clinical centres outside the university optometric clinic under supervision;
17. demonstrate experience in workplace principles and ethics from centres outside the university optometric clinic; and
18. produce a written report of the activities that took place during the 6-months clinical (industrial) experience.

Course Contents

OPT 598 (Externship and SIWES): The course is for six months (i.e, 500 Level 2nd Semester and Long vacation) covering industrial and clinical attachment and rotation for ophthalmic care, optical laboratory and dispensing experience in solo/group practice, as well as in optometric instrumentation and patient care provided in hospital, or multi-disciplinary health care settings (external to the University) by students under strict supervision of approved supervisors/preceptors. The aim of the course is for student to acquire industrial (clinical) experience under the Industrial Training Fund (ITF) scheme. Complete 24 weeks of 500 Level 2nd semester and immediate long vacation posting under the Students' Industrial Work Experience Scheme (SIWES) utilizing the 6-month Logbook from ITF. Finally, students on returning to the institution will present a seminar on major duties performed and skills acquired during the training. Grades are allotted according to ITF and individual institution guidelines. Students must submit a report on their ITF experience. The report will form part of the assessment/grade for the course.

600 Level

OPT 601: Primary Care Optometry Clinic I

(2 Units C: PH 90)

Learning Outcomes

At the end of OPT 601 (Primary Care Optometry Clinic I), the student should be able to:

1. conduct visual test for patients of different age groups comprising children, adult and geriatric population;
2. adequately diagnose ocular disorder;
3. fit contact lenses;
4. determine from case history, refractive status and corrected vision of the patient;
5. determine binocularity through findings;
6. determine refractive adjustment for distance vision based on binocular status as well as best vision for near working distance;
7. design suitable treatment plan for each problem presented by the patients or discovered during eye examination in the clinic; and
8. individually handled at least 15 cases and assessed by their supervisors.



Course Contents

Clinical practice with emphasis on total scope of optometric patient care including general care of children, adults and geriatric populations; diagnosis of ocular disease; contact lenses; visual training and dispensing.

OPT 602: Primary Care Optometry Clinic II

(2 Units C: PH 90)

Learning Outcomes

At the end of OPT 602 (Primary Care Optometry Clinic II), the student should be able to:

1. conduct visual test for patients of different age groups comprising children, adult and geriatric population;
2. adequately diagnose ocular disorder;
3. fit contact lenses;
4. determine from case history, refractive status and corrected vision of the patient;
5. determine binocularity through findings;
6. determine refractive adjustment for distance vision based on binocular status as well as best vision for near working distance;
7. design suitable treatment plan for each problem presented by the patients or discovered during eye examination in the clinic; and
8. individually handled at least 15 cases and assessed by their supervisors.

Course Contents

Clinical practice with emphasis on total scope of optometric patient care including general care of children, adults and geriatric populations; diagnosis of ocular disease; contact lenses; visual training and dispensing.

OPT 603: Rehabilitative and Low Vision Clinic

(1 Unit C: PH 45)

Learning Outcomes

At the end of the OPT 603 (Rehabilitative and Low Vision Clinic) course, the students should be able to:

1. carry out effective low vision examination/assessment and diagnosis on patients under supervision by a certified clinician;
2. carry out effective low vision treatment and management on patients under supervision by a certified clinician;
3. conduct a proper referral of low vision patients, when necessary, to clinicians with expert training in managing low vision cases;
4. counsel low vision/visual impairment patients on their condition and the management options;
5. conduct an assessment of the living environment of low vision patients in order to maximize their vision; and
6. display adequate knowledge / proficiency in handling low vision aids, devices, and instrument.



Course Contents

Examination, diagnosis, treatment and management of pediatric and geriatric patients exhibiting various forms of low vision and visual challenges/impairments.

OPT 604: Paediatric Optometry Clinic**(1 Unit C: PH 45)****Learning Outcomes**

At the end of the OPT 604 course, the students should be able to:

1. conduct effective visual examination/assessment on paediatric patients under supervision;
2. conduct effective clinical treatment and management on paediatric patients;
3. properly refer paediatric patients, when necessary, to clinicians with expert training in managing paediatric cases; and
4. counsel parents and/or guardians of paediatric patients on their condition and the appropriate management options.

Course Contents

Examination, diagnosis, treatment, and management of infants to adolescents. Orthoptics practice.

OPT 605: Patient Management Seminars**(1 Unit C: PH 45)****Learning Outcomes**

At the end of the OPT 605 course, the students should be able to:

1. input information on patient's records in an optometric practice;
2. generate a written report from a patient clinical profile;
3. present a report of clinical findings of patients in workshops / seminars;
4. have a grasp of referrals and inter-disciplinary approach to patient care; and
5. display current diagnostic and therapeutic techniques in ophthalmic patient management.

Course Contents

Seminars and clinical rounds: case presentation and discussions of patient management philosophies; Standard optometric analysis and therapies; Current diagnostic and therapeutic techniques; Referrals and inter-disciplinary approach to patient care. Prescription and follow-up care. Advanced patient management.

OPT 607: Advanced Practice Management**(1 Unit C: LH 15)****Learning Outcomes**

At the end of OPT 607 (Advanced Practice Management), students should be able to:

1. source finance for the establishment of an optometric practice and operation;
2. engage in viable purchasing practices for equipment and method of stocking materials, tools and equipment for optometric practices and operation;
3. identify accounting principles, procedures for proper accountability in the field of optometric practices and as well understand the investment practices in the field of optometry operation; and
4. have insightful knowledge about the limited liability companies with respect to registration and documentation policy and legal systems and employment agreement that affect optometric practices.



Course Contents

Financing the optometric practice; Initial purchase of equipment and stock; Accounting procedures; Investments; Limited Liability Companies. Introduction to the legal system; Employment agreements.

OPT 609: Neuropathology**(1 Unit C: LH 15)****Learning Outcomes**

At the end of OPT 609 (Neuropathology) course, the students should be able to:

1. describe the parts of the brain responsible for vision;
2. identify pupillary and accommodative anomalies in neurological diseases;
3. explain headaches, migraines, and other photopsic episodes;
4. describe optic nerve disorders, supra-nuclear, nuclear and intra-nuclear; and
5. explain oculomotor presentations, nystagmus, practical approach to some common non-ocular neurological complaints.

Course Contents

Review of human anatomy. Pupillary and accommodative anomalies in neurological diseases. Headaches, migraines, and other photopsic episodes. Optic nerve disorders, supra-nuclear, nuclear and intra-nuclear. Oculomotor presentations, nystagmus, practical approach to some common non-ocular neurological complaints.

OPT 611: Seminar in Research Topics**(1 Unit C: PH 45)****Learning Outcomes**

At the end of OPT 611 (Seminar in Research Topics), students should be able to:

1. discuss what others have done in previous years in a particular field, topic or study;
2. demonstrate mastery over a desired topic and the subject area;
3. discuss current trends in a given area or specialty;
4. identify gaps, shortcomings, inconsistencies, and debates in a given field;
5. develop a project idea to fill in research gaps or solve health problems; and
6. present thoroughly thought through own idea and project.

Course Contents

Recent developments in Optometry. Current research methods, advantages and disadvantages. Review of current literature. Current diagnostic and therapeutic techniques, advantages and drawbacks.

OPT 613: Hospital Practice Exposure**(1 Unit C: PH 45)****Learning Outcomes**

At the end of the OPT 613 course, the students should be able to:

1. discuss different services offered in the hospital setting;
2. appreciate the hierarchy / organogram of hospitals / health centers;
3. describe how to integrate optometric unit in the hospital or health center setting;
4. state the role of optometric services in an inter-disciplinary setting; and
5. explain how records are managed in health care facilities.



Course Contents

This involves exposure of patients in different units within health care setting external to the University: Hospitals, Health Centres and ambulatory care services. Inter-disciplinary practice.

OPT 698: Research Project**(3 Units C: PH 135)****Learning Outcomes**

At the end of OPT 698 (Research Project), the student should be able to:

1. develop critical thinking skills and strong coping strategies;
2. develop good analytical and presentation skills;
3. develop good interpersonal relationship with teachers and peers;
4. develop good mastery of handling equipment with effective utilization;
5. collect and use data to fill gaps in knowledge and improving eye care delivery; and
6. present thoroughly thought through own idea and project orally, poster and mini-dissertation.

Course contents

An investigation is carried out in specialised areas of optometry under the supervision of academic staff and a thesis embodying the results is submitted and defended at the end.



Minimum Academic Standards

Equipment

Physiological Optics and Geometrical Optics unit

| | | |
|--|---|--------|
| 1. Nagel anomaloscope | - | 1 Unit |
| 2. 100 Hue colour test instrument or ishihara plates | - | 2 |
| 3. Monochrometer | - | 2 |
| 4. Red and green filters | - | 4 |
| 5. Lenses and lens holders | - | 5 |
| 6. Optical benches | - | 4 |
| 7. Wratten colour filters (Nos. 22,473,74,290 | - | 3 sets |
| 8. Neutral density filters (0.1,0.2---1.0,2.0,3.0) | - | 3 sets |
| 9. Artificial pupils (1mm,2mm,2.5mm) | - | 3 sets |
| 10. Dark adaptometer | - | 1 |
| 11. Schematic eyes | - | 6 |
| 12. Trial frames and lenses (A.O. or equivalent) | - | 3 |
| 13. Lens measures | - | 6 |
| 14. IPD rule | - | 20 |
| 15. Mirrors | - | 10 |

Low vision and rehabilitative optometry laboratory

| | | |
|--|---|--------|
| 1. Low vision kits | - | 3 sets |
| 2. Stand magnifiers | - | 2 |
| 3. Pinholes | - | 6 |
| 4. Artificial eyes (Ocular prostheses) | - | 2 |
| 5. Trial lens case | - | 2 |
| 6. Artificial pupils | - | 4 |
| 7. Telescopes | - | 3 |

Binocular vision laboratory unit

| | | |
|---|---|--------|
| 1. Haplosopes and grades I,II,III targets | - | 5 sets |
| 2. Trial Lens Set | - | 5 |
| 3. Phoropter | - | 2 sets |
| 4. Vectograms | - | 5 |
| 5. Prism bars | - | 5 |
| 6. Stereogram and stereogram mounts | - | 5 |
| 7. After – image equipment | - | 1 |
| 8. Hess – lancaster screen | - | 2 |
| 9. Haidinger brush apparatus | - | 1 |
| 10. Worth – 4 dot test apparatus | - | 2 |
| 11. Meridional magnifiers | - | 2 sets |
| 12. Space eikonometer | - | 1 |
| 13. Polaroid lens and spectacles | - | 2 |
| 14. Disparometers | - | 2 |



Contact lens laboratory unit

| | | | |
|-----|---------------------------------|---|----------|
| 1. | Hard contact lens trial set | - | 2 sets |
| 2. | Hard contact lens solutions | - | 30 packs |
| 3. | Soft contact lens Solutions | - | 30 packs |
| 4. | Soft contact lens trial sets | - | 10 |
| 5. | Radiuscope | - | 1 |
| 6. | Diameter gauge | - | 2 |
| 7. | Keratometer | - | 1 |
| 8. | Slit lamp biomicroscope | - | 1 |
| 9. | Suction cups for holding lenses | - | 5 |
| 10. | Purging machine | - | 1 |
| 11. | Saline solution (bottles) | - | 10 |
| 12. | Schirmer tear test strip boxes | - | 5 |

Ocular anatomy laboratory

| | | | |
|----|---|---|----|
| 1. | Dissection kits | - | 5 |
| 2. | Plastic Human Skulls | - | 5 |
| 3. | Microscopes | - | 4 |
| 4. | Prepared assorted Slides for Histological Studies | - | 10 |
| 5. | Bovine Eyes (consumables) | - | 20 |
| 6. | Refrigerator | - | 1 |

Pre-clinical laboratories unit

| | | | |
|-----|--|---|----------|
| 1. | Phoropters and phoropter stands | - | 20 units |
| 2. | Diagnostic kit | - | 4 |
| 3. | Trial lens cases | - | 8 |
| 4. | Lensometer | - | 4 |
| 5. | Slit lamp biomicroscope | - | 2 |
| 6. | Keratometer | - | 2 |
| 7. | Visual field equipment: central -2, peripheral-2 | | |
| 8. | Tonometers indentation-2, applanation-2 | | |
| 9. | Acuity charts near-4, distance-4 | | |
| 10. | Archer – elliot distance VA cabinet-4 | | |

Optometric clinic unit

| | | | |
|-----|---|---|------------|
| 1. | Diagnostic sets/kits | - | 8 |
| 2. | Phoropters and phoropter stands | - | 10 |
| 3. | Keratometers | - | 4 |
| 4. | Slit lamps | - | 4 |
| 5. | Trial lens cases | - | 10 |
| 6. | Lensometers / focimeters | - | 10 |
| 7. | Visual field equipment: central-4, peripheral-4 | | |
| 8. | Tonometers – indentation-5, applanation-5, non-contact | - | 2 |
| 9. | Acuity charts-4, (near and distance) – illiterate (snellen)-3, non illiterate (snellen) children- 3, low vision | | - 3 - 3 |
| 10. | Archer elliot distance V.A. charts | | - 10 |
| 11. | Low vision diagnostic/management kits | | - 3 |
| 12. | Contact lens trial sets (hard)- 4, (soft) | - | 4 |



| | | | |
|-----|-----------------------------------|---|-------------|
| 13. | Handheld maddox rod | - | 6 |
| 14. | IPD rule | - | 10 |
| 15. | Hydraulic chairs for phoropters | - | 10 |
| 16. | Synoptophores | - | 2 |
| 17. | Grades I,II,III targets | - | 2 Sets each |
| 18. | Lenses (consumables) | - | 250 |
| 19. | Frames (consumables) | - | 250 |
| 20. | Diagnostic drugs (consumables) | - | 50 |
| 21. | Binocular indirect ophthalmoscope | - | 2 |

Ophthalmic / dispensing optics laboratory unit

| | | | |
|-----|------------------------------------|---|------------|
| 1. | Edgers (Manual) | - | 4 Units |
| 2. | Edgers (Automatic) | - | 2 |
| 3. | Bead (frame) Heaters | - | 2 |
| 4. | Formats for glazing | - | 100 |
| 5. | Lensometers | - | 2 |
| 6. | Pattern Markers | - | 5 |
| 7. | Surfacing Machines | - | 5 |
| 8. | Frames (consumables) | - | 200 |
| 9. | Lenses (consumables) | - | 200 pairs |
| 10. | IPD Rule | - | 10 |
| 11. | Layout Card | - | 10 |
| 12. | Indian Ink (bottles) (consumables) | - | 10 bottles |

Staffing

Academic

1. The minimum ratio of academic staff to students in the OD programme shall be 1:10. The academic staff to student ratio should not exceed 1: 15 for the programme.
2. The programme should have at least 70% of its total academic staff possessing PhD degree or relevant postgraduate professional qualifications. In addition candidates possessing higher academic qualifications such as M.Sc. / PhD or FNCO with OD in relevant specialties can be employed as a Lecturer I. The entry point for a licensed Optometrist with OD is Lecturer II. An academic staff without first degree qualification in Optometry cannot head the Doctor of Optometry programme. Academic staff should be in the right mix in accordance with stipulated guidelines.
3. No Lecturer will be promoted to the rank of Senior Lecturer without a PhD degree or relevant postgraduate professional qualifications in Optometry.
4. There should be availability of adequately qualified lecturers in a minimum of five (5) of eight (8) areas of Optometry specialisations with at least two (2) lecturers (of Lecturer I / II and a Senior lecturer status and above) for each specialty in order to operate a full Doctor of Optometry curriculum.

The areas of specialties in Optometry are:

Primary care optometry,
Cornea and Contact Lens care,
Pediatric optometry,
Ocular health
Orthoptics,
Low vision and rehabilitative optometry,



Environmental and public health Optometry, and Vision science.

Non-academic Staff:

There shall be technical and administrative staff support for the OD programme, with the following specifically domiciled in the School/Department:

Four Technologists to maintain and repair the equipment used in Optometry Clinic and Laboratories and provide technical support,

Two Administrative Officers with at least one not below the rank of Assistant Registrar, Library Officer to manage the Departmental virtual and physical libraries,

Secretarial staff including at least one in the rank of Confidential Secretary,

Information and Communication Technology (ICT) Officer, and

Office Support junior Staff including office assistants and many others.

Library & Information Resources

There shall be a School/Departmental-based hybrid of physical and virtual library with modern information communication technology facilities (such as PCs, Laptops and audio-visual materials) for electronic access and retrieval of information.

Additionally, the Faculty/College/University Library shall have a dedicated section with adequate provision of current books and journals, periodicals and bibliographic indices on Optometry and Vision Science.

Classroom, Laboratories and Office Spaces

The University shall ensure the provision of adequate human, physical, equipment and library facilities in all the learning areas with strong information communication technology infrastructure for the implementation of these minimum standards.

The University shall provide purpose-built Optometry building structure and necessary facilities with adequate and appropriate equipment to facilitate effective teaching and learning of the different areas of this curriculum, with adequate and efficient maintenance back-up.

Classroom

The standard requirement of 0.65m² per full-time student should be maintained. Thus the minimum total space requirement for a faculty or department shall be the product of its total full time equivalent student enrolment (FTE) and the minimum space requirement per full-time equivalent i.e. (FTE) 0.65m².

Office

In this respect, each academic staff should have an office space of at least 25 square metres taking into cognisance the status/cadre of the staff

In addition, there should be for the Faculty, a Dean's office and for each Department a Head of Department's office with attached offices for their supporting staff as specified below in m²:

| | | |
|----------------------------------|---|-------|
| Professor's office | - | 18.50 |
| Head of Department's office | - | 18.50 |
| Tutorial teaching staff's office | - | 13.50 |
| Other teaching staff space | - | 7.00 |
| Technical staff space | - | 7.00 |
| Secretarial space | - | 7.00 |
| Staff research laboratory | - | 16.50 |



| | | |
|--------------------------------|---|------|
| Seminar Space/per student | - | 1.85 |
| Laboratory space (per student) | - | 7.50 |

Each professor shall have a spacious office with an ante-office for the secretary or administrative staff working with the professor.

Senior Lecturer and above should be given one office with complimentary furniture including at least one bookshelf, one file cabinet, fridge and TV. Lecturers II and I should not be more than two in one office.



B.Sc. Pharmacology

Overview

Pharmacology is the study of drugs and their effects on living organisms. It is concerned with basic processes of how drugs interact with receptors, cells, tissues and whole animals based on a good knowledge and understanding of basic organic chemistry, physiology, biochemistry and recently genomics in the treatment of diseases and how the body interacts with the drug (i.e., the ways in which the body breaks down and gets rid of them). When combined with drug discovery, development and regulation modules, it will also focus on how new drugs are designed, synthesised and manufactured and existing therapies improved upon and/or repurposed.

In summary, knowledge and skills relevant to the pharmaceutical industry and services that will help to address global health challenges in tackling antibiotic resistance, discovering new drugs to treat Ebola and Covid-19; Alzheimer's and Parkinson's diseases; diabetes, cardiovascular disease and repurposing existing drugs for the treatment of new diseases will be gained.

Philosophy

To train high level, globally-competitive pharmacologists with excellent employment prospects in the area of drug discovery, development and control so as to fill the gaps in the pharmaceutical industries, research institutes and drug regulatory agencies, serve as trainers who can further train towards specialisation in health institutions, have sufficient management ability to play leadership role in the health sector and sound entrepreneurship skills.

Objectives

Objectives of the Bachelor of Science in Pharmacology are to:

1. expose students to intellectually stimulating and satisfying experience of learning, studying, research, creativity and innovation;
2. equip students to become scientists and researchers with broad and balanced knowledge and practical skills about drugs at the molecular, cellular, tissue and systems levels to enable them perform effectively independently or in collaboration with others in health-related industries;
3. produce graduates of Pharmacology that can become skilled health care workers in pharmaceutical industries (in area of drug discovery and development) and drug regulatory affairs;
4. enable graduates of the programme to be broad-knowledged and skilled pharmacologists who would meet global standards and could undertake further training towards specialisation in different areas of the field;
5. produce graduates that can serve as future pharmacology teachers in the University most especially in the Schools/Colleges of Medicine, Pharmacy and other Allied Health Sciences; and
6. enable graduates of the programme to develop sufficient management ability to play leadership role in a wide range of career positions in the health sector and sound entrepreneurship skills in establishing self and employing others.



Unique Features of the Programme

The course content of the programme is comparable to those of several Universities in the USA, UK (England and Scotland) and Europe that have established standards of education and research in the areas of biomedical sciences including Pharmacology.

Relevant knowledge and skills required for a career in Pharmacology are taught and gained in this curriculum.

Specifically

1. Introduction to General Microbiology (MCB 201, 2 units) has been added to the courses.
2. Drug discovery and development course (PHA 302) as introduced, was non-existent in the NUC BMAS. This course forms the bedrock of Pharmacology because traditionally and still relevant today, the programme graduates seek employment primarily in research, pharmaceutical industry and recently, drug regulatory affairs.
3. SIWES has been moved from 200 Level (a level when even basic pharmacology courses have not been taught) to 300 Level when the objectives of SIWES will very likely be achieved.
4. Introduction of Molecular Biology (BCH 202, 2 Units) has been added to the courses.
5. Physiology courses have been unbundled into specific body system(s) for effective teaching and learning.

Employability Skills

Subject specific skills

1. an understanding of medications, their sources, chemical properties, biological effects and therapeutic uses;
2. competence in in vitro experimental studies/models and high throughput screening assays;
3. ability to design and carry out controlled in vivo experiments on substances and their effects on organisms;
4. expertise in in silico (use of software to capture analyze and integrate biological and medical data from many diverse sources) drug development procedures;
5. Ability to carry out acute toxicological studies to profile safety indices of drug compounds;
6. expertise in conduct of clinical trials in healthy humans and patients;
7. sound understanding of key advantages of novel drugs over classical ones for drug marketing;
8. employing sophisticated laboratory equipment to collect and analyze data;
9. drawing up proposals for future tests;
10. disseminating the results of the tests to others in the form of written reports, articles to be published in journals, and presentations;
11. analysing the results of patient drug interactions to identify trends. Deciding on the success of trials and whether the dosage needs to be modified; and
12. networking skills and the ability to build effective links with external organisations



Other skills

1. Excellent written and oral communication skills.
2. Ability to work independently and as part of a team.
3. Accuracy and attention to detail.
4. Strong IT skills, including data retrieval and analysis
5. Ability to determine what drugs affect sleep and behavior and how they do this.
6. Critical thinking and inquisitive mind.
7. Excellent time management, self-discipline and ability to work without close supervision.

21st Century Skills

The programme will lead to the development/acquisition of the following 21st Century Skills:

1. collaboration and team work;
2. creativity and imagination;
3. critical thinking;
4. problem solving;
5. flexibility and adaptability;
6. information Literacy;
7. leadership;
8. civic literacy and citizenship;
9. social responsibility;
10. technology literacy; and
11. initiative.

which will prepare students for successful careers in chosen settings nationally and globally.

Admission and Graduation Requirements

There are two different pathways by which candidates can be admitted into the programmes: the Unified Tertiary Matriculation (UTME) and the Direct Entry.

Four-Year Degree Programme (UTME)

The candidate is expected to have successfully passed in Chemistry, Physics, Biology, Mathematics and English Language at the credit level in the Senior Secondary School Certificate (SSC) or its equivalent at not more than two sittings. This is in addition to an acceptable pass in the Uninified Tertiary Matriculation Examination (UTME).

It may be desirable to mount appropriate interviews for candidates before admission in order to ensure that students with the right attitude and aptitude for the competencies expected are selected.

Direct Entry

Candidates for direct entry must have A' Level credits in Chemistry, Physics/Maths and Zoology/Botany/Biology, in addition to UTME requirements.

Candidate seeking admission through this mode should in addition to the UTME requirements possess passes in Physics, Chemistry and Biology or Zoology at the Higher School Certificates or Advanced Level of General Certificate Examination or its equivalent

The programme duration shall be for a period of four academic sessions (eight semester) for UTME candidates and three academic sessions (six semester) for Direct Entry candidates.



Graduation Requirements and Award of BSc Pharmacology Degree

To be eligible for the award of the Bachelor of Science Degree in Pharmacology, a student must have passed all the prescribed core courses and obtain a minimum total of **90 Units** in the three-year programme or **120 Units** in the four-year programme, inclusive of the university course requirements.

Global Course Structure

100 Level

| Course Code | Course Title | Unit(s) | Status | LH | PH |
|-------------|--------------------------------|-----------|--------|----|----|
| GST 111 | Communication in English | 2 | C | 15 | 45 |
| GST 112 | Nigerian Peoples and Culture | 2 | C | 30 | - |
| BIO 101 | General Biology I | 2 | C | 30 | - |
| BIO 102 | General Biology II | 2 | C | 30 | - |
| BIO 107 | General Biology Practical I | 1 | C | - | 45 |
| BIO 108 | General Biology Practical II | 1 | C | - | 45 |
| CHM 101 | General Chemistry I | 2 | C | 30 | - |
| CHM 102 | General Chemistry II | 2 | C | 30 | - |
| CHM 107 | General Chemistry Practical I | 1 | C | - | 45 |
| CHM 108 | General Chemistry Practical II | 1 | C | - | 45 |
| PHY 101 | General Physics I | 2 | C | 30 | - |
| PHY 102 | General Physics II | 2 | C | 30 | - |
| PHY 107 | General Physics Practical I | 1 | C | - | 45 |
| PHY 108 | General Physics Practical II | 1 | C | - | 45 |
| | Total | 22 | | - | - |

200 Level

| Course Code | Course Title | Unit(s) | Status | LH | PH |
|-------------|---|-----------|--------|----|----|
| GST 212 | Philosophy, Logic and Human Existence | 2 | C | 30 | |
| ENT 211 | Entrepreneurship and Innovation | 2 | C | 30 | - |
| ANA 201 | Anatomy of Upper & Lower Limbs | 2 | C | 15 | 45 |
| BCH 201 | General Biochemistry I | 2 | C | 30 | - |
| BIO 201 | Genetics 1 | 2 | C | 30 | - |
| PMB 201 | Introduction to Pharmaceutical Microbiology | 2 | C | 15 | 45 |
| PCH 203 | Pharmaceutical Organic Chemistry | 2 | C | 30 | - |
| BIO 208 | Biostatistics | 1 | C | 15 | - |
| PIO 201 | Introductory Physiology and Blood | 2 | C | 30 | - |
| PIO 305 | Neurophysiology I | 2 | C | 15 | 45 |
| PIO 214 | Introduction to Cardiovascular & Respiratory Physiology | 2 | C | 15 | 45 |
| PIO 218 | Introduction to Laboratory Physiology | 1 | C | - | 45 |
| PIO 212 | Renal and Body Fluids Physiology | 2 | C | 30 | - |
| | Total | 23 | | | |



300 Level

| Course Code | Course Title | Unit(s) | Status | LH | PH |
|--------------------|--|----------------|---------------|-----------|-----------|
| GST 312 | Peace and Conflict Resolution | 2 | C | 30 | |
| ENT312 | Venture Creation | 2 | C | 15 | 45 |
| PHA 301 | General Principles of Pharmacology | 1 | C | 15 | - |
| PHA 302 | Pharmacokinetics and Pharmacogenetics | 1 | C | 15 | - |
| PHA 303 | Autonomic Pharmacology I | 1 | C | 15 | - |
| PHA 304 | Autonomic Pharmacology II | 1 | C | 15 | - |
| PHA 305 | Neuropharmacology: CNS Depressants and Stimulants | 2 | C | 15 | 45 |
| PHA 306 | Pharmacology of Respiratory and Cardiovascular Systems | 2 | C | 15 | 45 |
| PHA 307 | Drug Discovery and Development | 2 | C | 15 | 45 |
| PHA 308 | Endocrine and Reproductive System Pharmacology | 2 | C | 15 | 45 |
| PHA 309 | Toxicology | 1 | C | 15 | - |
| PHA 310 | Chemotherapy of Tropical Infections. Antiseptics & Disinfectants | 2 | C | 15 | 45 |
| PHA 311 | Research Methods, ICT Skills and Ethics in Pharmacology | 1 | C | 15 | - |
| PHA 312 | Students' Industrial Work Experience | 3 | C | - | 135 |
| PHA 313 | Pharmacology of Renal System and GIT | 1 | C | 15 | - |
| Total | | 24 | | | |

400 Level

| Course Code | Course Title | Unit(s) | Status | LH | PH |
|--------------------|---|----------------|---------------|-----------|-----------|
| PHA 401 | Chemotherapy of Microbial Diseases Vaccines and Sera | 2 | C | 15 | 45 |
| PHA 402 | Chemotherapy of Neoplastic Diseases, Anti-neoplastic agents | 1 | C | 15 | - |
| PHA 403 | Immuno-Pharmacology: Inflammation, Allergy and Anaphylaxis | 2 | C | 15 | 45 |
| PHA 404 | Psycho-pharmacology | 1 | C | 15 | - |
| PHA 405 | Ethnopharmacology | 2 | C | 15 | - |
| PHA 406 | Seminars in pharmacology | 2 | C | 30 | - |
| PHA 407 | Projects in Pharmacology | 4 | C | - | 180 |
| PHA 408 | Vitamins and Nutritional Haemopoietic Agents | 1 | C | 15 | - |
| PHA 409 | Quantitative Pharmacology | 2 | C | 15 | 45 |
| Total | | 17 | | | |



Course Contents and Learning Outcomes

100 Level Courses

Students take most of these courses from the Faculty of Science and the General Studies and Entrepreneurial Directorate in the University.

General Learning Outcome

At the end of these courses, the students should be able to apply their understanding of the fundamentals of chemistry and biology to explain the key principles of Biochemistry, Microbiology, Molecular and Cellular Biology.

GST 111: Communication in English

(2 Units C: LH 15; PH 45)

Learning Outcomes

At the end of the course, the students should be able to

1. identify possible sound patterns in English Language;
2. list notable Language skills;
3. classify word formation processes;
4. construct simple and fairly complex sentences in English;
5. apply logical and critical reasoning skills for meaningful presentations;
6. demonstrate an appreciable level of the art of public speaking and listening; and
7. write simple and technical reports.

Course Contents

Sound patterns in English Language (vowels and consonants, phonetics and phonology). English word classes (lexical and grammatical words, definitions, forms, functions, usages, collocations). Sentence in English (types: structural and functional, simple and complex). Grammar and Usage (tense, mood, modality and concord, aspects of language use in everyday life). Logical and Critical Thinking and Reasoning Methods (Logic and Syllogism, Inductive and Deductive Argument and Reasoning Methods, Analogy, Generalisation and Explanations). Ethical considerations, Copyright Rules and Infringements. Writing Activities: (Pre-writing, Writing, Post writing, Editing and Proofreading; Brainstorming, outlining, Paragraphing, Types of writing, Summary, Essays, Letter, Curriculum Vitae, Report writing, Note making and many others. Mechanics of writing). Comprehension Strategies: (Reading and types of Reading, Comprehension Skills, 3RsQ). Information and Communication Technology in modern Language Learning. Language skills for effective communication. Major word formation processes. Writing and reading comprehension strategies. Logical and critical reasoning for meaningful presentations. Art of public speaking and listening.



GST 112: Nigerian Peoples and Culture

(2 Units C: LH 30)

Learning Outcomes

At the end of the course, the students should be able to

1. analyse the historical foundation of the Nigerian culture and arts in pre-colonial times;
2. list and identify the major linguistic groups in Nigeria;
3. explain the gradual evolution of Nigeria as a political unit;
4. analyse the concepts of Trade, Economic and Self-reliance status of the Nigerian peoples towards national development;
5. enumerate the challenges of the Nigerian State towards Nation building
6. analyse the role of the Judiciary in upholding people's fundamental rights
7. identify acceptable norms and values of the major ethnic groups in Nigeria; and
8. list and suggest possible solutions to identifiable Nigerian environmental, moral and value problems.

Course Contents

Nigerian history, culture and art up to 1800 (Yoruba, Hausa and Igbo peoples and culture; peoples and culture of the ethnic minority groups). Nigeria under colonial rule (advent of colonial rule in Nigeria; Colonial administration of Nigeria). Evolution of Nigeria as a political unit (amalgamation of Nigeria in 1914; formation of political parties in Nigeria; Nationalist movement and struggle for independence). Nigeria and challenges of nation building (military intervention in Nigerian politics; Nigerian Civil War). Concept of trade and economics of self-reliance (indigenous trade and market system; indigenous apprenticeship system among Nigeria people; trade, skill acquisition and self-reliance). Social justices and national development (law definition and classification. Judiciary and fundamental rights. Individual, norms and values (basic Nigeria norms and values, patterns of citizenship acquisition; citizenship and civic responsibilities; indigenous languages, usage and development; negative attitudes and conducts. Cultism, kidnapping and other related social vices). Re-orientation, moral and national values (The 3R's – Reconstruction, Rehabilitation and Re-orientation; Re-orientation Strategies: Operation Feed the Nation (OFN), Green Revolution, Austerity Measures, War Against Indiscipline (WAI), War Against Indiscipline and Corruption (WAIC), Mass Mobilisation for Self-Reliance, Social Justice and Economic Recovery (MAMSER), National Orientation Agency (NOA). Current socio-political and cultural developments in Nigeria.

BIO 101: General Biology I

(2 Units C: LH 30)

Learning Outcomes

At the end of this course, students should be able to:

1. explain cell's structure and organisations;
2. summarise functions of cellular organelle;
3. characterise living organisms and state their general reproduction;
4. describe the interrelationship that exists between organisms;
5. discuss the concept of heredity and evolution; and
6. enumerate habitat types and their characteristics.



Course Contents

Cell structure and organisation. functions of cellular organelles. characteristics and classification of living things. chromosomes, genes their relationships and importance. General reproduction. Interrelationships of organisms (competitions, parasitism, predation, symbiosis, commensalisms, mutualism, saprophytism). Heredity and evolution (introduction to Darwinism and Lamarckism, Mendelian laws, explanation of key genetic terms). Elements of ecology and types of habitat.

BIO 102: General Biology II

(2 Units C: LH 30)

Learning Outcomes

At the end of the lectures, students should be able to:

1. List the characteristics, methods of identification and classification of Viruses, bacteria and fungi;
2. state the unique characteristics of plant and animal kingdoms;
3. describe ecological adaptations in the plant and animal kingdoms;
4. explain nutrition, respiration, excretion and reproduction in plants and animals; and
5. describe growth and development in plants and animals.

Course Contents

Basic characteristics, identification and classification of viruses, bacteria and fungi. A generalised survey of the plant and animal kingdoms based mainly on the study of similarities and differences in the external features. Ecological adaptations. Briefs on physiology to include nutrition, respiration, circulatory systems, excretion, reproduction, growth and development.

BIO 107: General Biology Practical I

(1 Unit C: PH 45)

Learning Outcomes

At the end of the course, students should be able to:

1. outline common laboratory hazards;
2. provide precautions on laboratory hazards;
3. state the functions of the different parts of microscope;
4. use the microscope and describe its maintenance;
5. draw biological diagrams and illustrations; and
6. apply scaling and proportion to biological diagrams.

Course Contents

Common laboratory hazards: prevention and first aid. Measurements in biology. Uses and care of microscope. Compound and dissecting microscope. Biological drawings and illustration, scaling, accuracy and proportion; use of common laboratory apparatus and laboratory experiments designed to illustrate the topics covered in BIO 101.



BIO 108: General Biology Practical II

(1 Unit C: PH 45)

Learning Outcomes

At the end of the course, students should be able to:

1. describe the anatomy of flowering plants;
2. differentiate types of fruit and seeds;
3. state ways of handling and caring for biological wares;
4. describe the basic histology of animal tissues; and
5. identify various groups in the animal kingdom.

Course Contents

Anatomy of flowering plants, primary vegetative body: stem, leaf and root to show the mature tissues namely parenchyma, collenchyma, sclerenchyma, xylem and phloem. Types of fruits and seeds. Care and use of dissecting kits and other biological wares. Dissection and general histology of animal tissues based on vertebrate forms. Morphology and functions of epithelial, muscular, nervous and connective tissues. Examination of various groups of lower invertebrates under microscopes, identification of various groups of organisms in Animal Kingdom. And any experiment designed to emphasise the practical aspects of topics in BIO 102.

CHM 101: General Chemistry I

(2 Units C: LH 30)

Learning Outcomes

At the end of this course, the students should be able to:

1. define atom, molecules and chemical reactions;
2. discuss the Modern electronic theory of atoms;
3. write electronic configurations of elements on the periodic table;
4. rationalise the trends of atomic radii, ionization energies, electronegativity of the elements based on their position in the periodic table;
5. identify and balance oxidation – reduction equation and solve redox titration problems.
6. draw shapes of simple molecules and hybridized orbitals;
7. identify the characteristics of acids, bases and salts, and solve problems based on their quantitative relationship;
8. apply the principles of equilibrium to aqueous systems using Le Chatelier's principle to predict the effect of concentration, pressure and temperature changes on equilibrium mixtures;
9. analyse and perform calculations with the thermodynamic functions, enthalpy, entropy and free energy; and
10. determine rates of reactions and its dependence on concentration, time and temperature.

Course Contents

Atoms, molecules and chemical reactions. Modern electronic theory of atoms. Electronic configuration, periodicity and building up of the periodic table. Hybridization and shapes of simple molecules. Valence Forces. Structure of solids. Chemical equations and stoichiometry. Chemical bonding and intermolecular forces. Kinetic theory of matter. Elementary thermochemistry. Rates of reaction. Equilibrium and thermodynamics. Acids, bases and salts. Properties of gases. Redox reactions and introduction to electrochemistry. Radioactivity.



CHM 102: General Chemistry II

(2 Units C: LH 30)

Learning Outcomes

At the end of this course, the students should be able to:

1. state the importance and development of organic chemistry;
2. define fullerenes and its applications;
3. discuss electronic theory;
4. determine the qualitative and quantitative of structures in organic chemistry;
5. describe rules guiding nomenclature and functional group classes of organic chemistry;
6. determine rate of reaction to predict mechanisms of reactions;
7. identify classes of organic functional group with brief description of their chemistry;
8. discuss comparative chemistry of group 1A, IIA and IVA elements; and
9. describe basic properties of Transition metals.

Course Contents

Historical survey of the development and importance of Organic Chemistry. Fullerenes as fourth allotrope of carbon, uses as nanotubes, nanostructures, nanochemistry. Electronic theory in organic chemistry. Isolation and purification of organic compounds. Determination of structures of organic compounds including qualitative and quantitative analysis in organic chemistry. Nomenclature and functional group classes of organic compounds. Introductory reaction mechanism and kinetics. Stereochemistry. The chemistry of alkanes, alkenes, alkynes, alcohols, ethers, amines, alkyl halides, nitriles, aldehydes, ketones, carboxylic acids and derivatives. The Chemistry of selected metals and non-metals. Comparative chemistry of group IA, IIA and IVA elements. Introduction to transition metal chemistry.

CHM 107: General Chemistry Practical I

(1 Unit C: PH 45)

Learning Outcomes

At the end of the course the students should be able to:

1. state the general laboratory rules and safety procedures;
2. collect scientific data and correctly carrying out Chemical experiments;
3. identify the basic glassware and equipment in the laboratory;
4. state the differences between primary and secondary standards;
5. perform redox titration;
6. recording observations and measurements in the laboratory notebooks; and
7. analyse the data to arrive at scientific conclusions.

Course Contents

Laboratory experiments designed to reflect topics presented in courses CHM 101 and CHM 102. These include acid-base titrations, qualitative analysis, redox reactions, gravimetric analysis, data analysis and presentation.



CHM 108: General Chemistry Practical II

(1 Unit C: PH 45)

Learning Outcomes

At the end of this course, the students should be able to:

1. identify the general laboratory rules and safety procedures;
2. collect scientific data and correctly carrying out Chemical experiments;
3. identify the basic glassware and equipment in the laboratory;
4. identify and carry out preliminary tests which includes ignition, boiling point, melting point, test on known and unknown organic compounds;
5. perform solubility tests on known and unknown organic compounds;
6. conduct elemental tests on known and unknown compounds; and
7. conduct functional group/confirmatory test on known and unknown compounds which could be acidic / basic / neutral organic compounds.

Course Contents

Continuation of CHM 107. Additional laboratory experiments to include functional group analysis, quantitative analysis using volumetric methods.

PHY 101: General Physics I (Mechanics)

(2 Units C: LH 30)

Learning Outcomes

At the end of the course, student should be able to;

1. identify and deduce the physical quantities and their units;
2. differentiate between vectors and scalars;
3. describe and evaluate motion of systems on the basis of the fundamental laws of mechanics;
4. apply Newton's laws to describe and solve simple problems of motion;
5. evaluate work, energy, velocity, momentum, acceleration, and torque of moving or rotating objects;
6. explain and apply the principles of conservation of energy, linear and angular momentum;
7. describe the laws governing motion under gravity; and
8. explain motion under gravity and quantitatively determine behaviour of objects moving under gravity.

Course Contents

Space and time. Units and dimension, Vectors and Scalars. Differentiation of vectors: displacement, velocity and acceleration. Kinematics. Newton laws of motion (Inertial frames, Impulse, force and action at a distance, momentum conservation). Relative motion. Application of Newtonian mechanics. Equations of motion. Conservation principles in physics. Conservative forces. Conservation of linear momentum. Kinetic energy and work. Potential energy. System of particles. Centre of mass. Rotational motion: Torque, vector product, moment, rotation of coordinate axes and angular momentum. Polar coordinates. Conservation of angular momentum. Circular motion. Moments of inertia. gyroscopes and precession. Gravitation: Newton's Law of Gravitation. Kepler's Laws of Planetary Motion. Gravitational Potential Energy. Escape velocity. Satellites motion and orbits.



PHY 102: General Physics II (Electricity & Magnetism)

(2 Units C: LH 30)

Learning Outcomes

At the end of this course, the student should be able to:

1. describe the electric field and potential, and related concepts, for stationary charges;
2. calculate electrostatic properties of simple charge distributions using Coulomb's law, Gauss's law and electric potential;
3. describe and determine the magnetic field for steady and moving charges;
4. determine the magnetic properties of simple current distributions using Biot-Savart and Ampere's law;
5. describe electromagnetic induction and related concepts, and make calculations using Faraday and Lenz's laws;
6. explain the basic physical of Maxwell's equations in integral form;
7. evaluate DC circuits to determine the electrical parameters; and
8. determine the characteristics of ac voltages and currents in resistors, capacitors, and Inductors.

Course Contents

Forces in nature. Electrostatics; electric charge and its properties, methods of charging. Coulomb's law and superposition. electric field and potential. Gauss's law. Capacitance. Electric dipoles. Energy in electric fields. Conductors and insulators, current, voltage and resistance. Ohm's law and analysis of DC circuits. Magnetic fields. Lorentz force. Biot-Savart and Ampère's laws. magnetic dipoles. Dielectrics. Energy in magnetic fields. Electromotive force. Electromagnetic induction. Self and mutual inductances. Faraday and Lenz's laws. Step up and step-down transformers: Maxwell's equations. Electromagnetic oscillations and waves. AC voltages and currents applied to inductors, capacitors, resistance, and combinations.

PHY 107: General Practical Physics I

(1 Unit C: PH 45)

Learning Outcomes

At the end of the course, the student should be able to;

1. conduct measurements of some physical quantities;
2. make observations of events, collect and tabulate data;
3. identify and evaluate some common experimental errors;
4. plot and analyse graphs; and
5. draw conclusions from numerical and graphical analysis of data.

Course Contents

This introductory course emphasises quantitative measurements. The treatment of measurement errors, and graphical analysis. A variety of experimental techniques should be employed. The experiments include studies of meters, the oscilloscope, mechanical systems, electrical and mechanical resonant systems. Light. Heat. Viscosity and many others, covered in PHY 101 and PHY 102. However, emphasis should be placed on the basic physical techniques for observation, measurements, data collection, analysis and deduction.



PHY 108: General Practical Physics II

(1 Unit C: PH 45)

Learning Outcomes

At the end of this course, the student should be able to:

1. conduct measurements of some physical quantities;
2. make observations of events, collect and tabulate data;
3. identify and evaluate some common experimental errors;
4. plot and analyse graphs;
5. draw conclusions from numerical and graphical analysis of data; and
6. prepare and present practical reports.

Course Contents

This practical course is a continuation of PHY 107 and is intended to be taught during the second semester of the 100 level to cover the practical aspect of the theoretical courses that have been covered with emphasis on quantitative measurements. The treatment of measurement errors, and graphical analysis. However, emphasis should be placed on the basic physical techniques for observation, measurements, data collection, analysis and deduction.

200 Level

GST 212: Philosophy, Logic and Human Existence

(2 Units C: LH 30)

Learning Outcomes

A student who has successfully gone through this course should be able to:

1. describe the basic features of philosophy as an academic discipline;
2. identify the main branches of philosophy & the centrality of logic in philosophical discourse;
3. state the elementary rules of reasoning;
4. distinguish between valid and invalid arguments;
5. think critically and assess arguments in texts, conversations and day-to-day discussions;
6. critically assess the rationality or otherwise of human conduct under different existential conditions;
7. develop the capacity to extrapolate and deploy expertise in logic to other areas of knowledge, and
8. guide his or her actions, using the knowledge and expertise acquired in philosophy and logic.

Course Contents

Scope of philosophy; notions, meanings, branches and problems of philosophy. Logic as an indispensable tool of philosophy. Elements of syllogism, symbolic logic— the first nine rules of inference. Informal fallacies, laws of thought, nature of arguments. Valid and invalid arguments, logic of form and logic of content — deduction, induction and inferences. Creative and critical thinking. Impact of philosophy on human existence. Philosophy and politics, philosophy and human conduct, philosophy and religion, philosophy and human values, philosophy and character molding and many others.



ENT 211: Entrepreneurship and Innovation

(2 Units C: LH 30)

Learning Outcomes

At the end of this course, students should be able to:

1. explain the concepts and theories of entrepreneurship, intrapreneurship, opportunity seeking, new value creation, and risk taking;
2. state the characteristics of an entrepreneur;
3. analyse the importance of micro and small businesses in wealth creation, employment, and financial independence;
4. engage in entrepreneurial thinking;
5. identify key elements in innovation;
6. describe stages in enterprise formation, partnership and networking including business planning; and
7. describe contemporary entrepreneurial issues in Nigeria, Africa and the rest of the world.
8. state the basic principles of e-commerce.

Course Contents

Concept of Entrepreneurship (Entrepreneurship, Intrapreneurship/Corporate Entrepreneurship). Theories, rationale and relevance of entrepreneurship (Schumpeterian and other perspectives, risk-taking, necessity and opportunity-based entrepreneurship and creative destruction). Characteristics of entrepreneurs (Opportunity seeker, risk taker, natural and nurtured, problem solver and change agent, innovator and creative thinker). Entrepreneurial thinking (Critical thinking, reflective thinking, and creative thinking). Innovation (Concept of innovation, dimensions of innovation, change and innovation, Knowledge and innovation). Enterprise formation, partnership and networking (Basics of business plan, forms of business ownership, business registration and forming alliances and joint ventures). Contemporary entrepreneurship issues (Knowledge, skills and technology, intellectual property, virtual office, networking). Entrepreneurship in Nigeria (Biography of inspirational entrepreneurs, youth and women entrepreneurship, entrepreneurship support institutions, youth enterprise networks and environmental and cultural barriers to entrepreneurship). Basic principles of e-commerce.

ANA 201: Anatomy of Upper & Lower Limbs

(2 Units C: LH 15; PH 45)

Learning Outcomes

At the end of this course, students should be able to:

1. define fundamental anatomical terminology and discuss the anatomical position;
2. describe the anatomy of the musculoskeletal system, including the axial skeleton; appendicular skeleton, appendicular and axial muscles, and arthrology;
3. describe the general features of the bones of the upper and lower limbs;
4. identify the major muscles of the upper and lower limbs;
5. explain the types and structure of the joints of the upper and lower limbs;
6. correlate between the attachment of the muscles and their functions on the different joints;
7. identify the major nerves of the upper and lower limbs;
8. describe the functional components of each of the major nerves and its distribution;
9. identify and describe the course of the major superficial veins of the upper and lower limbs; and
10. name the major arteries of the upper and lower limbs.



Course Contents

Descriptive terms, plans and terms of relationship of the human body, terms of comparison, attachment of muscles, types of muscles, movements of joints. Osteology, principles of kinesiology, general organisation of body system. Cutaneous innervation of the upper limb; pectoral region; breast; axilla; shoulder region; arm and cubital fossa; flexor compartment of forearm; extensor compartment of forearm; hand; venous and lymphatic drainage of the upper limb. Applied anatomy of nerves; blood supply of the upper limb. Cutaneous innervation of the lower limb; femoral triangle; adductor canal and medial side of the thigh; gluteal region; back of the thigh, popliteal fossa; extensor compartment of the leg and dorsum of the foot; peroneal and flexor compartment of the leg; sole of the foot, arches of the foot; mechanism of walking; venous and lymphatic drainage of the lower limb; applied anatomy of the nerves and blood supply to the lower limb.

PCH 203: Organic Pharmaceutical Chemistry

(2 Units C: LH 15; PH 45)

Learning Outcomes

At the end of the course, students should be able to:

1. discuss the basic concepts in and fundamental principles of organic chemistry;
2. define, identify and name the functional group(s) present in an organic compound;
3. discuss the properties of acids and bases;
4. identify conjugate acid-base pairs;
5. use the K_a and pK_a values to determine the strength of acid/base solutions;
6. discuss the properties of a buffer;
7. recognise and draw structural isomers and stereoisomers;
8. draw mirror image of any molecule;
9. identify the stereo centres in any molecule and assign the configuration as R and S;
10. recognise and explain how various physical properties might vary or might not vary for enantiomers or diastereoisomers;
11. explain that pure form of isomers can be obtained from a racemic mixture;
12. state the different methods/processes of resolution; and
13. be able to identify the problem of racemisation in drug discovery and the tools to predict it.

Course Contents

Fundamental concepts and techniques of organic chemistry. Functional group chemistry. Strengths of acids and bases. Introduction to stereochemistry of compounds. Molecular symmetry, racemisation and resolution methods.

BIO 208: Biostatistics

(2 Units C: LH 30)

Learning Outcomes

At the end of the lectures in this course, students should be able to:

1. differentiate between continuous and discontinuous data;
2. explain sampling procedures in biology;
3. summarise and present biological data;
4. describe measures of central tendency and probability theory; and
5. conduct ANOVA, Chi-square, t-tests and F-tests and state their importance.



Course Contents

Variability in biological data: continuous and discontinuous variables. statistical sampling procedures. observations and problems of estimation. representation and summarisation of biological data. frequency distribution. measures of central tendency and dispersion. Probability theory. normal, binomial and Poisson distribution. t-test, f-test and chi-square test. analysis of variance (ANOVA) and covariance. principles of experimental design. correlation, linear and curvilinear regression and transformation.

PMB 201: Introductory Pharmaceutical Microbiology (2 Units C: LH 15; PH 45)

Learning Outcomes

At the end of the course, the students should be able to:

1. discuss the definition, scope and founding fathers of Microbiology;
2. list the morphology, classification and nomenclature of microorganisms of pathogenic organisms;
3. discuss the nutritional needs of microorganisms;
4. divide bacteria into classes based on Gram staining and use biochemical techniques in differentiating bacterial species;
5. state the sources, modes of transmission and describe the pathogenesis of the diseases produced by the microorganisms;
6. conduct the cultivation of and isolation methods for microorganisms;
7. explain the bacterial growth curve and the log phase;
8. describe the mechanisms of immunity of infection;
9. define parasitology and identify classes of parasites of public health importance; and
10. apply the methods of sterilisation and disinfection to prevent and control infections.

Course Contents

Historical development of microbiology and the effects on health. Morphology of bacteria and fungi. Nutritional needs of microorganisms. Cultivation and isolation methods for microorganisms. Diagnostic techniques in relation to culture determination. Bacteria growth in culture and respective phases including death. Formation of colonies. Metabolism in microbial systems. Genetics (introductory). Introductory parasitology.

BIO 201: Genetics I (2 Units C: LH 30)

Learning Outcomes

At the end of this course, the students should be able to:

1. distinguish between heritable and non-heritable characteristics;
2. explain the likelihood of genetic events (probability) and how well those events (results) fit into a set of observation;
3. discuss polygenic variations; and
4. describe concepts in population genetics.

Course Contents

Hereditary and non-hereditary characteristics. Probability and tests of goodness of fit. Quantitative inheritance; variation in genome structure, introduction to population genetics.



Biochemistry

BCH 201: General Biochemistry I

(2 Units C: LH 30)

Learning Outcomes

At the end of the course, students should be able to:

1. explain the structure of different macromolecules in biological system;
2. identify types of chemical reactions involving these macromolecules;
3. explain the various methods of isolation of these macromolecules;
4. estimate the effects of acids and alkalis on the macromolecules;
5. describe purification of macromolecules; and
6. discuss quantification of the various macromolecules.

Course Contents

Introductory chemistry of amino acids, their properties, reactions and biological functions. Classification of amino acids: neutral, basic and acidic; polar and non-polar; essential and non-essential amino acids. Peptides. Introductory chemistry and classification of proteins. Biological functions of proteins. Methods of their isolation, purification and identification. Primary, secondary, tertiary and quaternary structures of proteins. Basic principles of tests for proteins and amino acids. Introductory chemistry of carbohydrates, lipids and nucleic acids. Nomenclature of nucleosides and nucleotides, effects of acid and alkali on hydrolysis of nucleic acids.

Physiology Courses (for the BSc Pharmacology Degree)

PIO 201: Introductory Physiology and Blood

(2 Units C: LH 30)

Learning Outcomes

At the end of the course, the students should be able to

1. describe the composition of a cell membrane;
2. explain how a potential difference across a membrane will influence the distribution of a cation and an anion;
3. describe how transport rates of certain molecules and ions are accelerated by specific membrane transport proteins;
4. distinguish between active (primary and secondary) transport, facilitated diffusion, and passive diffusion based on energy source and carrier protein involvement;
5. identify the mechanisms and role of selective transporters for amino acids, neurotransmitters, nutrients, etc.;
6. explain the general concepts of homeostasis and the principles of positive and negative feedback in physiological systems;
7. identify the site of erythropoietin production, the stimulus for its release, and the target tissue for erythropoietin action;
8. discuss the normal balance of red blood cell synthesis and destruction, including how imbalances in each lead to anemia or polycythemia;
9. list and differentiate the various types of leukocytes;
10. describe the role of thrombocytes in haemostasis; and
11. list clotting factors and discuss the mechanism of anti-coagulants.

Course Contents



Introduction and history of physiology. Structure and functions of cell membranes. Transport process. Special transport mechanism in amphibian bladder, kidney, gall bladder, intestine, astrocytes and exocrine glands. Biophysical principles. Homeostasis and control systems including temperature regulation. Biological rhythms. Composition and functions of blood. Haemopoiesis. WBC and differential count. Plasma proteins Coagulation, fibrinolysis and platelet functions. Blood groups –ABO system – Rh system. Blood transfusion – indication for collection and storage of blood, hazards of blood transfusions. Reticulo- endothelial system. Immunity and immodeficiency disease and HIV.

PIO 305: Neurophysiology I

(2 Units C: LH 30)

Learning Outcomes

At the end of the course, the students should be able to:

1. explain how inhibitory and excitatory post-synaptic potentials can alter synaptic transmission;
2. list the major receptor classifications and representative receptor agonists;
3. describe the cutaneous and proprioceptive mechanoreceptors and their function;
4. describe formation and reabsorption of cerebral spinal fluid (CSF), including the anatomy and function of the choroid plexus;
5. compare and contrast the barrier mechanisms between the blood brain barrier and the blood CSF barrier and the consequences of barrier break down;
6. describe the major areas of the cerebral cortex and their roles in perception and motor coordination. Identify the Brodmann areas for visual, auditory, somatosensory, motor, and speech areas;
7. discuss the pathways for Pain/Temperature/Coarse Touch System and its connections to the cerebral cortex;
8. list the neural components of the Dorsal Column-Medial Lemniscus system and its Trigeminal analogues;
9. describe the functions of the medial and lateral motor pathways. Trace their origins and terminations within the spinal cord;
10. describe the physiologic-anatomy of the major ascending tracts (anterolateral and dorsal column-medial lemniscus systems) and descending spinal cord tract (cortico-spinal tract, CST), including crossing of midline;
11. list the functions of the following brainstem reflexes: cardiovascular baroreceptor, respiratory stretch receptor, cough reflex, pupillary light reflex, gag reflex, and blink reflex;
12. explain the role of the brain stem reticular formation in pain perception and modulation, level of consciousness, integration of brainstem reflexes, and the location of noradrenergic, serotonergic, and dopaminergic nuclei;
13. list the physiological functions of the Hypothalamus;
14. list the three functional divisions of the cerebellum, detailing the input and output connections of each. Describe how these areas are integrated with the lateral and medial motor pathways;
15. discuss the overall functions of the basal ganglia in the initiation and control of movement;
16. describe how the amygdala interacts with the cerebral cortex to produce cognitive emotional behaviours;
17. describe the three states of human brain activity based on EEG, EOG and EMG recordings; and
18. distinguish the major characteristics of the major seizure disorders: Grand mal, Absence seizure (Petite mal), simple partial and complex partial seizures, and status epilepticus.



Course Contents

Introduction - Organisation of the CNS and CNS control systems. Nerve generation and conduction of impulses. Synapses and synaptic transmission. Peripheral nervous system -the reflex arc and general properties of reflexes. Receptors. Spinal reflexes. Excitation and Inhibition. Localisation of functions in the cortex. Motor system. Pyramidal and extrapyramidal sensory systems. Reticular formation. Cerebellum: Control of posture. Neurobiology rhythms. Sleep and unconscious states. Memory, learning.

Physiology of Special Senses: Eyeball: retina, sight, accommodation. Photochemical mechanism. Receptor potential. Light reflexes and adaptation. Ear: sound waves, hearing. Taste. Smell.

PIO 203: Introduction to Cardiovascular and Respiratory Physiology (2 Units C: LH 15)

Learning Outcomes

At the end of the course, the students should be able to:

1. state Starling's law of the heart and describe the application of the law in keeping the output of the left and right ventricles equal;
2. describe how ionic currents contribute to the four phases of the cardiac action potential;
3. explain the ionic mechanism of pacemaker automaticity and rhythmicity, and identify cardiac cells that have pacemaker potential and their spontaneous rate;
4. identify neural and humoral factors that influence their rate;
5. describe the various phases of ventricular systole and ventricular diastole;
6. describe the timing and causes of the four heart sounds;
7. explain why the ECG tracing looks different in each of the 12 leads;
8. explain the principles underlying cardiac output measurements using the Fick principle, dye dilution, and thermodilution methods;
9. list the factors that shift laminar flow to turbulent flow;
10. describe the relationship between velocity, viscosity, and audible events, such as murmurs and bruits;
11. describe how arterial systolic, diastolic, mean, and pulse pressure are affected by changes in a) stroke volume, b) heart rate, c) arterial compliance, and d) total peripheral resistance;
12. define the Starling equation and discuss how each component influences fluid movement across the capillary wall;
13. list the anatomical components of the baroreceptor reflex;
14. explain three positive feedback mechanisms activated during severe hemorrhage that may lead to circulatory collapse and death;
15. define compliance and identify two common clinical conditions in which lung compliance is higher or lower than normal;
16. list the factors that determine total lung capacity, functional residual capacity, and residual volume;
17. define surface tension and describe how it applies to lung mechanics, including the effects of alveolar size and the role of surfactants;
18. explain how the shape of the oxyhemoglobin dissociation curve influences the uptake and delivery of oxygen;
19. list the forms in which carbon dioxide is carried in the blood; and
20. identify the regions in the central nervous system that play important roles in the generation and control of normal respiration.



Course Contents

The heart; events of the cardiac cycle. Control of cardiac contractility. Cardiac electrophysiology. Properties of cardiac muscles. Cardiac output - measurement and control. Haemodynamics of circulation. Arterial blood pressure and its regulation. Cardiovascular reflexes. Peripheral resistance and local control of the circulation. Regional blood flow. Cardiovascular changes in exercise, haemorrhage and shock. Respiratory physiology – functions of upper respiratory tract. Mechanics of respiration including compliance. Surfactant. Lung volume and capacities. Pulmonary gas exchange. Blood gas transport. Pulmonary function tests. Nervous and chemical control of respiration. Response to hypoxia, high altitude, exercise and artificial respiration.

PIO 204: Introduction to Laboratory Physiology

(1 Unit C: LH 15)

Learning Outcomes

At the end of the course, the students should be able to

1. acquaint themselves with the proper handling of laboratory equipment;
2. dissect laboratory animals and mount an isolated organs for a specific experiment;
3. use human subjects for some of the experiments like blood grouping, etc.;
4. take recordings of an experiment and interpret the results accordingly; and
5. state basic laboratory management techniques and safety measures.

Course content

Laboratory sessions on basic physiology experiments, especially those related to the frog sciatic nerve, smooth muscles and blood physiology.

PIO 212: Renal and Body Fluids Physiology

(2 Units C: LH 30)

Learning Outcomes

At the end of the course, the students should be able to

1. sketch a cross section of a kidney; identify the renal cortex, renal medulla, renal calyces, medullary pyramids, renal pelvic space, renal artery, renal vein, and ureter;
2. describe renal blood flow, renal plasma flow, glomerular filtration rate, and filtration fraction and list typical values;
3. explain the concept of renal clearance. Use the clearance equation and an appropriate compound to estimate the glomerular filtration rate, renal plasma flow, and renal blood flow;
4. describe the effects of reductions in GFR on plasma creatinine concentrations and plot the relationship;
5. discuss the role of the ascending limb of the loop of Henle in producing a high renal interstitial fluid osmolality. From the loop of Henle, contrast the tubular fluid and interstitial fluid osmolality changes that allow either a dilute or a concentrated urine to be produced and excreted;
6. describe processes that lead to acid-base disturbances and list the common causes;
7. identify major routes and normal ranges for water intake and loss, and predict how changes in intake and loss affect the distribution of total body water.
8. list the various body fluid compartments and their ionic compositions
9. describe the methods used in measuring the body fluid compartments and
10. discuss the role of the kidney in maintaining homeostasis of body fluids



Course Contents

Macroscopic, microscopic and ultra-structure of the kidney. Elements of renal functions. Glomerular filtration. Concept of clearance. Tubular reabsorption and secretion. Renal blood flow. Body fluid and electrolyte balance. Buffer mechanism and pH regulation. Counter-current system. Micturition. Abnormalities of renal functions. Composition and estimation of body fluid compartments. Concept of water and electrolyte balance. Role of the kidney in body fluid homeostasis.

300 Level

GST 312: Peace and Conflict Resolution

(2 Units C: LH 30)

Learning Outcomes

At the end of the course, the students should be able to

1. analyse the concepts of peace, conflict and security;
2. list major forms, types and root causes of conflict and violence;
3. differentiate between conflict and terrorism;
4. enumerate security and peace building strategies; and
5. describe roles of international organisations, media and traditional institutions in peace building.

Course Contents

Concepts of peace, conflict and security in a multi-ethnic nation. Types and Theories of Conflicts: Ethnic, Religious, Economic, Geo-political Conflicts; Structural Conflict Theory, Realist Theory of Conflict, Frustration-Aggression Conflict Theory. Root causes of Conflict and Violence in Africa: Indigene and settlers Phenomenon; Boundaries/boarder disputes; Political disputes; Ethnic disputes and rivalries; Economic Inequalities; Social disputes; Nationalist Movements and Agitations; Selected Conflict Case Studies – Tiv-Junkun; Zango Kartaf, Chieftaincy and Land disputes and many others. Peace Building, Management of Conflicts and Security: Peace & Human Development. Approaches to Peace & Conflict Management --- (Religious, Government, Community Leaders and many others.. Elements of Peace Studies and Conflict Resolution: Conflict dynamics assessment Scales: Constructive & Destructive. Justice and Legal framework: Concepts of Social Justice; The Nigeria Legal System. Insurgency and Terrorism. Peace Mediation and Peace Keeping. Peace & Security Council (International, National and Local levels) Agents of Conflict resolution – Conventions, Treaties Community Policing: Evolution and Imperatives. Alternative Dispute Resolution, ADR. Dialogue b). Arbitration, c). Negotiation d). Collaboration and many others. Roles of International Organisations in Conflict Resolution. (a). The United Nations, UN and its Conflict Resolution Organs. (b). The African Union & Peace Security Council (c). ECOWAS in Peace Keeping. Media and Traditional Institutions in Peace Building. Managing Post-Conflict Situations/Crisis: Refugees. Internally Displaced Persons, IDPs. The role of NGOs in Post-Conflict Situations/Crisis.



ENT 312: Venture Creation

(2 Units C: LH 15; PH 45)

Learning Outcomes

At the end of this course, the students, through case study and practical approaches, should be able to:

1. describe the key steps in venture creation;
2. spot opportunities in problems and in high potential sectors regardless of geographical location;
3. state how original products, ideas, and concepts are developed;
4. develop business concept for further incubation or pitching for funding;
5. identify key sources of entrepreneurial finance;
6. implement the requirements for establishing and managing micro and small enterprises;
7. conduct entrepreneurial marketing and e-commerce;
8. apply a wide variety of emerging technological solutions to entrepreneurship and
9. appreciate why ventures fail due to lack of planning and poor implementation.

Course Contents

Opportunity identification (Sources of business opportunities in Nigeria. Environmental scanning, demand and supply gap/unmet needs/market gaps/Market Research, Unutilised resources, Social and climate conditions and Technology adoption gap). New business development (business planning, market research). Entrepreneurial Finance (Venture capital, Equity finance, Micro finance, Personal savings, small business investment organisations and Business plan competition). Entrepreneurial marketing and e-commerce (Principles of marketing, Customer Acquisition & Retention, B2B, C2C and B2C models of e-commerce, First Mover Advantage, E-commerce business models and Successful E-Commerce Companies,). Small Business Management/Family Business: Leadership & Management, Basic book keeping, Nature of family business and Family Business Growth Model. Negotiation and Business communication (Strategy and tactics of negotiation/bargaining, Traditional and modern business communication methods). Opportunity Discovery Demonstrations (Business idea generation presentations, Business idea Contest, Brainstorming sessions, Idea pitching). Technological Solutions (The Concept of Market/Customer Solution, Customer Solution and Emerging Technologies, Business Applications of New Technologies - Artificial Intelligence (AI), Virtual/Mixed Reality (VR), Internet of Things (IoTs), Blockchain, Cloud Computing, Renewable Energy and many others. Digital Business and E-Commerce Strategies).

PHA 301: General Principles of Pharmacology

(1 Unit C: LH 15)

Learning Outcomes

At the end of the course, the students should be able to:

1. list sources of drugs
2. describe the various routes of drug administration and how they influence onset of drug action;
3. explain the factors that affect drug absorption, distribution, metabolism and excretion;
4. discuss the role of receptors as targets for drug action;
5. enumerate the fundamental differences between agonists and antagonists; and
6. describe the common system parameters in pharmacokinetics and their measurements.



Course Contents

Introduction: History of Pharmacology and relationship of Pharmacology to other Pharmaceutical and clinical subjects. Definition and sources of Drugs. Routes of Drug Administration. Drug absorption, distribution, elimination and factors affecting them. Enzyme induction and enzyme inhibition. Mechanisms of drug action – Receptor and non-receptor theory. Drug dosage and dose response curves. Measurement of some pharmacokinetic parameters.

PHA 302: Pharmacogenetics and Pharmacokinetics

(1 Unit C: LH 15)

Learning Outcomes

At the end of the course, the students should be able to:

1. describe the concept of genetic variation (continuous and discontinuous) among the general population;
2. explain the significance of genetic polymorphism in the development, progression and treatment of human disease;
3. describe the models of drug distribution and elimination;
4. explain how dose, bioavailability, rate of absorption, apparent volume of distribution, total clearance and elimination half-life affect the plasma concentrations of a drug after administration of a single dose;
6. describe the factors which determine the time-course of systemic accumulation of a drug administered by infusion or multiple doses;
8. use the pharmacokinetic parameters to determine loading and maintenance doses of specific drug regimens; and
9. recognise the factors that affect hepatic and renal clearance (blood flow, protein binding, intrinsic clearance and many others).

Course Contents

Pattern of transmission of single gene trait. Hardy-Weinberg Law Conditions for its Validity, application. On concepts of continuous and discontinuous variation. Pharmacogenetics (drug metabolism, tissue metabolism and receptor alterations). Compartment models (one and two) kinetics after intravenous and oral dosing. Bioavailability, Drug distribution, Protein binding. Renal excretion of drugs. Urinary excretion data in Pharmacokinetic analysis.

PHA 303: Autonomic Pharmacology I (Cholinergic (Parasympathetic) Mechanisms) (1 Unit C: LH 15)

Learning Outcomes

At the end of the course, students should be able to:

1. identify the main steps involved in neurotransmission;
2. recognise the anatomical and chemical characteristics of the parasympathetic and sympathetic nervous system;
3. identify major pre- and post- synaptic mechanisms by which drugs act.;
4. describe the metabolic fate of cholinergic neurotransmitter;
5. recognise the major differences between direct and indirect acting cholinergic agonists;
6. explain the structural and functional differences between muscarinic and nicotinic receptor types and subtypes, their locations in the body and mechanisms of action;
8. discuss the pharmacological actions, uses, side effects and structure activity relationship of drugs acting directly and indirectly on the parasympathetic nerve ending; and



9. explain the pharmacology of drugs acting on the autonomic ganglia and Neuromuscular Junction.

Course Contents

Introduction - Theory of Chemical Neurotransmission Evidence for Acetylcholine as a Cholinergic neurotransmitter. Detection and Bioassay of acetylcholine. Cholinergic receptors, sites of action of acetylcholine at the Neuromuscular junction. Agonists and antagonists of cholinergic transmission. Parasympathomimetic and parasympatholytic drugs. Structure – Activity Relationships among the cholinergic and anticholinergic agents. Cholinesterases and anti-cholinesterases. Properties and uses of anti-cholinesterases (reversible and irreversible). Brief mention of cholinesterase reactivators (pralidoxime, obidoxime) and their uses. Neuromuscular transmission and drugs which enhance neuromuscular transmission. Neuromuscular Blockade. Smooth muscle relaxants. Ganglion stimulation and blockade and their properties.

PHA 304: Autonomic Pharmacology II (Adrenergic (Sympathetic) Nervous System) (1 Unit C: LH 15)

Learning Outcomes

At the end of the course, students should be able to:

1. illustrate the synthesis and metabolic fate of adrenergic neurotransmitters and discuss the clinical importance of vanillyl mandelic acid (VMA) level measurement;
2. explain the structural and functional differences between adrenergic receptor types and subtypes, their locations in the body and mechanisms of pharmacological action; and
3. describe the synthesis, pharmacological actions, mechanisms of action, clinical indications, side effects and structure-activity relationship of drugs acting as agonists (direct and indirect) and antagonists on the sympathetic nervous system.

Course Contents

Introduction: Chemical neurotransmitters – Evidence for Noradrenaline as an adrenergic neurotransmitter, Synthesis, storage, release, metabolism, and uptake of catecholamines. Detection and bioassay of Adrenaline and Nor-adrenaline. Adrenergic receptors – Types of adrenoceptors. Concept of agonists and antagonists. Sympathomimetic amines – Catecholamines, properties and uses. Sympatholytic drugs (Adrenergic Blockers) properties and uses. Structure – Activity Relationships among the sympathomimetic amines and beta-Adrenergic Blockers.



PHA 305: Neuropharmacology- CNS Depressants and Stimulants (2 Units C: LH 15; PH 45)

Learning Outcomes

At the end of the course, students should be able to:

1. recall neurotransmission in the Central Nervous System;
2. explain the pathologies and treatment modalities of Parkinson's disease, Alzheimer's disease, Epilepsy, Schizophrenia and Depression;
3. discuss the pharmacology of hypnotics and sedatives including alcohols, barbiturates, benzodiazepines and other non-barbiturates;
4. explain prostaglandin synthesis and consequences of its blockade by NSAIDS to produce anti-inflammation, analgesia and antipyresis; and
5. describe the mechanisms of action, chemistry, clinical uses and adverse effects of local and general anaesthetic drugs and contrast between local and general anaesthetics.

Course Contents

Introduction: Review of functional organisation of CNS Pharmacology of drugs used as hypnotics, sedatives, antipsychotics, mood stabilising drugs, anticonvulsants and related disorders. Anxiolytic drugs. Tricyclic antidepressants and other CNS Stimulants and analeptics. Drugs used in Parkinson and other neurodegenerative diseases. Centrally-acting appetite suppressants. Theories of general anaesthesia, General anaesthetics, Local anaesthetics and pre-anaesthetic medications. Opioid analgesics and antagonists, non-steroidal anti-inflammatory analgesics.

Practical: Animal Models of Analgesia (Hot Plate and Tail Clip Methods), Epilepsy (Pentylenetetrazole PTZ, Strychnine, 4-aminopyridine and Maximal Electroshock test MEST-induced models of epilepsy). Induction of sleep with barbiturates, sedative-hypnotics, Induction of Parkinson disease in animals using 6-hydroxydopamine and MPTP and Induction of psychosis in animals with amphetamine and treatment with anti-psychotic agents.

PHA 306: Cardiovascular and Respiratory Pharmacology (2 Units C: LH 15; PH 45)

Learning Outcomes

At the end of the course, students should be able to

1. explain the pharmacology (mechanisms of action, clinical effects, indications, adverse effects and contraindications) of major drug classes acting on the cardiovascular and respiratory disorders. and the principles of therapy; and
2. outline the pharmacology of major classes of drugs used in the treatment of obesity.

Course Contents

Introduction: Cardiovascular system physiology. Pathophysiology and drugs used as Antihypertensives, Cardiac glycosides, antiarrhythmics and anti-Angina. Drug treatment of shock. Anti-Obesity and anti-lipidaemic drugs. Asthma and anti-asthmatic drugs. COPD, bronchitis and pneumonia. Cough and pharmacology of drugs used in the treatment of cough (Anti-tussives, expectorants and mucolytics).

Practical: Demonstration experiments with drugs acting on the CVS (Finkleman and Isolated perfused rabbit heart (Lagendroff) preparation), cat blood pressure and Respiratory system (Tracheal Chain Preparation).



PHA 307: Drug Discovery and Development

(2 Units C: LH 15; PH 45)

Learning Outcomes

At the end of the course, students should be able to

1. illustrate major approaches to drug discovery;
2. restate properties of drugs;
3. explain the techniques used to identify drug targets and lead compounds;
4. discuss methods for determining the pharmacological and toxicological properties of compounds;
5. describe the role of pharmacokinetic principles in the drug discovery process; and
6. discuss preclinical and clinical evaluation of new drugs.

Course Contents

Introduction: Medicines and discovery processes. Initial stages: Target discovery; applications of molecular biology, in silico methods and assays; lead discovery; lead optimization; biomarkers. Measurement of drug properties: assay techniques; agonists (full, partial, inverse and biased); competitive antagonists. *In vivo* models; pharmacokinetic profiles of compounds; pharmacogenetics and formulations. Pre-clinical safety assessment including acute toxicity evaluation, subacute and chronic toxicity studies, reproductive toxicity, carcinogenicity studies, mutagenicity and mechanistic toxicity studies. Limitations of preclinical studies. Problems associated with drug discovery and development. Later stages: Pharmaceutical development; phases of clinical evaluation; ethics (informed consent, good clinical practice, participation criteria, sponsorship) and concepts in clinical trial design. Pharmacovigilance.

e-Learning Activity

Links are provided to additional resources (further reading, videos, on-line activities) to support the lecture content.

Online self-assessment modules on the course content can be provided for formative feedback.

Practical: Experiments are designed to reflect the topics covered including spectrophotometry, chromatography, flow cytometry.

PHA 308: Endocrine & Reproductive System Pharmacology (2 Units C: LH 15; PH 45)

Learning Outcomes

At the end of the course, students should be able to:

1. recall the physiology of neuro endocrine hormonal regulation;
2. explain the mechanisms of action, adverse effects, contraindications and clinical uses of the major neuroendocrine hormones;
3. describe the pathophysiology/symptoms and treatment of the different types of diabetes; and
4. discuss the pharmacology of drugs acting on the reproductive system.

Course Contents

Hypothalamo-pituitary axis, Hormones of the hypothalamus and pituitary gland. Pharmacology of: anti-thyroid drugs. Parathyroid hormone and Calcitonin. Anterior pituitary hormones and related substances. Insulin and oral hypoglycaemic and hyperglycaemic agents. Oestrogen and progesterone – [Oral contraceptives and Fertility agents). Androgen and Anabolic steroids.

Practical: Designed to reflect the topics covered.



Learning Outcomes

At the end of the course, students should be able to:

1. state the definitions and terms used in toxicology and the dose-response relationships that define toxicological effects;
2. explain the mechanisms of chemical toxicity and general principles of management of acute poisoning;
3. discuss plant, bacterial and animal poisoning and pesticide toxicology;
4. discuss toxicology of heavy metals and their antagonists (chelating agents), food additives, solvents, vapours and gases;
5. summarise the toxicology of cosmetics, radiation and radioactive materials;
6. describe the toxic effects of environmental pollutants on organ system; and
7. explain the stages and toxico-legal aspects of death in chemical poisoning (Forensic toxicology).

Course Contents

Introduction: History and scope of / terms used in Toxicology. Toxicological Evaluation. Purpose and Value of ED₅₀ and LD₅₀ determination. General management of poisoning including resuscitation protocol, methods of reducing poison absorption, increasing elimination and antidotal therapy. Toxicokinetics including metabolism of toxic substances. Carcinogens and mutagens. Toxins of plant, bacteria and animal (snake, scorpion, bees, spiders, clostridium and botulinum) origins. Toxicology of ionizing radiations. Toxicity of pesticides, Insecticides (Organochlorine insecticides; DDT; chlorinated cyclodiene insecticides: Organophosphorus insecticides, acute poisoning, delayed neurotoxic effects; Carbamate insecticides; Herbicides; Chlorophenoxy- compounds; Dinitrophenols; Bipyridyl compounds: Fungicides (mention only). Rodenticides: Warfarin and Nafluorantate; Inorganic rodenticides (salts of thallium, barium zinc, and many others) and Fumigants (mention only)). Toxicity of Heavy metals including lead, mercury, arsenic, cadmium, iron, chromium, cyanide and their antagonists. Toxicity of Cosmetic ingredients such as talc, hydroquinone and many others. and Testing. Poisoning and Management of Drug Poisoning. Environmental Pollution. Industrial Toxicology including solvents, vapours and gases (Aliphatic halogenated hydrocarbons; Chloroform; Carbon tetrachloride; Tri-and tetrachloroethylene (briefly); Aliphatic alcohols: Ethanol; Methanol; Aromatic hydrocarbon solvents: Benzene, Kerosene, Carbon monoxide). Toxicology of Food Additives (preservatives, seasoning, flavouring, colouring agents) and contaminants. Forensic Toxicology.

**PHA 310: Chemotherapy of Tropical Infections, Disinfectants and Antiseptics
(2 Units C: LH 15; PH 45)****Learning Outcomes**

At the end of this course, students are expected to:

1. list the various types of medically-important parasites and their hosts;
2. explain the differences between protozoal and helminth infections;
3. discuss the general principles behind chemotherapy of parasitic diseases in human and animals;
4. discuss the mechanisms of action, adverse effects and contraindications of the major classes of drugs used in the treatment of protozoal and helminth infections; and



5. discuss the properties, chemical composition, classes, mechanisms of action and selection criteria of antiseptics and disinfectants.

Course Contents

Life cycle of malarial parasite. Life cycle of *E. histolytica*. Pharmacology of drugs used in the treatment of malaria, Amoebiasis, Trypanosomiasis, Leishmaniasis, Helminthiasis. Miscellaneous antimicrobial agents. Chemistry, mechanism of action, selection criteria and uses of disinfectants, antiseptics and sterilants.

PHA 311: Research Methods, ICT Skills and Ethics in Pharmacology (1 Unit C: LH 15)

Learning Outcomes

At the end of the course, the students should be able to:

1. discuss types of research;
2. describe types of research design;
3. identify types, choice and use of software packages;
4. explain types and relevance of research presentation;
5. state general principles of bioethics;
6. discuss ethical issues of research involving humans and animals; and
7. explain WHO strategies for bioethics.

Course Contents

Introduction to biomedical research. Types of research designs, literature review and referencing styles. Sampling and sampling techniques. Data analysis and presentation. Principles of ethics in biomedical research, ethical issues in handling, use and disposal of experimental animals, reduction, refinement and replacement (3Rs) regarding the use of animals in research and ethical issues in biomedical research involving humans. WHO and global strategies for ethics in animal and human research.

PHA 312: Students' Industrial Work Experience

(3 Units C: PH 135)

Learning Outcomes

At the end of the course, students should be able to:

1. demonstrate practical knowledge in handling equipment and machinery, processes and procedures that are both available and those not readily available in the University;
2. develop necessary skills that are likely to be needed for transitioning to work place after graduation; and
3. identify possible areas of job opportunities after graduation.



Course Contents

Students will be posted to recognised and relevant placement areas of their choice during the industrial training. Continuous assessment of students will be undertaken jointly by their industrial-based supervisors, ITF officials and institutional supervisors. Finally, students on returning to the institution will present a seminar on major duties performed and skills acquired during the training. Grades are allotted according to ITF directives.

PHA 313: Renal and GIT Pharmacology

(1 Unit C: LH 15)

Learning outcome

At the end of the course, the students should be able to:

1. discuss the pharmacology (mechanisms of action, clinical effects, indications, adverse effects and contraindications) of major drug classes acting on the renal and gastrointestinal systems and the principles of therapy.

Course Contents

Renal pharmacology: Anatomy, physiology and principles of diuresis, comprehensive pharmacology of diuretics (Thiazide and thiazide-like diuretics, Loop diuretics (high ceiling diuretic), Potassium-sparing diuretics, aldosterone antagonists. Mechanism of action of action, therapeutic uses, examples, adverse effects, contraindications and clinical status of inhibitors of carbonic anhydrase, water and osmotic diuretics, acid forming salt, mercurial diuretics, xanthines, pyrimidines and triazines.

GIT pharmacology: Introduction to gastrointestinal diseases. Pathophysiology and causes of peptic ulcer disease (roles of Ach, Histamine, HCl, Gastrin, Prostaglandins and *Helicobacter pylori*). Mechanisms of action, dosage forms, pharmacokinetics, clinical uses, side effects, contraindications, caution and drug interaction of drugs (Antacids, Proton pump inhibitors, H₂ receptor blockers, CCK receptor blockers, Antimuscarinic, Antibiotics, Prostaglandins and Cytoprotectives) used in the treatment of peptic ulcer disease. Purgatives, treatment of irritable bowel syndrome and Cohn's disease. Antiemetics and antidiarrheal and treatment of flatulence.

400 Level

PHA 401: Chemotherapy of Microbial Diseases, Vaccines and Sera (2 Units C: LH 30)

Learning Outcomes

At the end of the course, students should be able to:

1. state the definitions of the pharmacodynamic terms (bacteriostatic, bactericidal, time-dependence and many others) used to describe the effects of antimicrobial therapy;
2. classify and explain the mechanisms of action, pharmacokinetics, adverse drug reactions, contraindications of drugs used in the treatment of microbial and fungal diseases;
3. list the mechanisms by which pathogens acquire and express resistance to antibiotics;
4. classify and discuss the mechanisms of action, pharmacokinetics, adverse drug reactions, drug interaction, contraindications other therapeutic indications of antiretroviral drugs; and
5. explain the rationale for the choice of a single and combination therapies in these disease states.



Course Contents

Introduction: Terms and definitions of pharmacodynamic terms (bacteriostatic, bactericidal, time-dependent and many others) used to describe the effects of antimicrobial therapy the mechanisms by which pathogens acquire and express resistance to antibiotics.

Antibacterials/Antibiotics: The pharmacology of the following drugs: Sulphonamides. Beta-lactam antibiotics (penicillins, cephalosporins, carbapenems, and monobactams). Tetracyclines. Chloramphenicol. Aminoglycosides. Miscellaneous antibiotics - macrolides, polymyxins, lincosamides, quinolones, metronidazole, bacitracin.

Antifungal and antiviral agents. Drugs used in the treatment of Tuberculosis and Leprosy
Antifungal agents. Antiviral agents; HIV/AIDS treatment. Vaccines design strategies and Sera.

PHA 402: Chemotherapy of Neoplastic Diseases Anti-Neoplastic Agents (1 Unit C: LH 15)

Learning Outcomes

At the end of the course, the students should be able to:

1. explain the molecular basis of cancer;
2. state the principles of cancer chemotherapy;
3. classify and explain the mechanisms of action, pharmacokinetics and adverse effects (toxicities) of current drugs used in the treatment of cancers;
4. explain the rationale for the choice of a single and combination therapies in these disease states; and
5. discuss the mechanisms and issues of drug and multidrug resistance in cancer chemotherapy.

Course Contents

Introduction: Molecular basis of cancer including cell-cycle kinetics, principles of cancer chemotherapy and mechanisms underlying drug/multidrug resistance in cancer chemotherapy. Alkylating Agents, Antimetabolites, Hormones. Other anti-neoplastic agents (Antibiotics, Plant alkaloids and Miscellaneous). Radioactive isotopes; Control of antineoplastic chemotherapy; Summary of the chemotherapy of malignant diseases. Emerging new treatment with antibodies.

PHA 403: Immunopharmacology: Inflammation, Allergy and Anaphylaxis (2 Units C: LH 15; PH 45)

Learning Outcomes

At the end of the course, the students should be able to:

1. explain the mechanisms that underlie the cellular and molecular basis of immune system responses to a variety of conditions including chronic inflammatory diseases, cancer, COVID-19, autoimmunity and other selected diseases;
2. discuss the roles and therapeutic consequences of cytokines, vasoactive peptides and other mediators of pain;
3. appreciate current trends in the field of immunopharmacology including the development of novel antibody therapeutics, gene-based strategies, mRNA vaccines and therapeutics;
4. explain the traditional pharmacological approaches for treating a variety of inflammatory diseases (prostaglandin synthesis and consequences of its blockade by NSAIDs to produce anti-inflammation, analgesia and anti-pyrexia); and
5. discuss the pharmacology of drugs used in the treatment of Gout.



Course Contents

Introduction to immune system: Definitions, types (adaptive and innate), B and T lymphocytes, chemical mediators (cytokines, interleukenes, antibodies, and many others). Abnormal immune responses: Hypersensitivity (Type I, II, III, IV), Autoimmunity, immunodeficiency diseases. Immunosuppressive drugs: Glucocorticoids, Calcineurin inhibitors, Anti-proliferatives (mycophenolate e.t.c), cytotoxic agents, Antibodies, RhO (D) immune globulin, Monoclonal antibodies, (rituximab and many others). Cytokines: Interferones, TNF – alpha, and many others. Drug allergy, Tumor markers for solid tumors. Antigraft rejection drugs. Steroidal and non-steroidal anti-inflammatory drugs. Used in the treatment of gout.

Practical: Designed to reflect experimental models of the topics taught above.

PHA 404: Psychopharmacology

(1 Unit C: LH 15)

Learning Outcomes

At the end of the course, students should be able to:

1. explain the basic principles of psychopharmacology;
2. describe brain and nerve anatomy;
3. identify the various neurotransmitters in CNS and describe their distribution, receptor types and roles in pathologies of psychiatric disorders and impact on psychotropic drug use;
4. explain the concepts of substance abuse, addictive behaviour and substance dependence;
5. discuss the types and mechanisms of Drug Tolerance;
6. explain the physiological, psychological and sociological factors of drug abuse and addiction;
7. list the major categories of psychoactive drugs, and describe their effects, methods of use, and potential for addiction and dependence;
8. identify classes and schedules of drugs of addiction (Depressants and Stimulants); and
9. explain the principles, strategy and pharmacology of drug abuse prevention and treatment.

Course Contents

Introduction: Definition and basic principles of Psychopharmacology (chemical neurotransmission, transporters, receptors (classes (amines, amino acids, neuropeptides, peptide hormones and gases, their subclasses and distribution in CNS,)), receptor types (ionotropic and metabotropic) ion channels and enzymes as targets of psychopharmacological drug action. Roles of the receptors in pathologies and treatment of psychiatric disorders (Myasthenia gravis, Alzheimer's disease, Parkinson's disease, Schizophrenia Epilepsy, Depression and many others. Developmental Psychopharmacology (Blood-Brain Barrier (BBB) and other membrane phenomena). Nutritional Psychopharmacology. Drug tolerance (definition, types (metabolic, functional) and other drug effects (cross tolerance, sensitization, withdrawal symptoms); Drug abuse (causative factors (social, environmental and physiological) and drug Addiction, Classes of psychotropic drugs (analgesics (opiates, cannabinoids), alcohol (alcoholism and Korsakoff's syndrome), Stimulants (nicotine, cocaine, amphetamine), Hallucinogens (LSD, phencyclidine, peyote and mushrooms) and Recreational drugs (Ecstasy and many others), their effects, methods of use, and potential for addiction and dependence. Drug abuse prevention and treatment (detoxification, use of agonists (methadone), anti-craving medication (naltrexone) and immunisation (production of antibodies that remove abused drug from circulation) modalities. Applicable national and international laws and acts governing control drugs.

PHA 405: Ethnopharmacology

(2 Units C: LH 15; PH 45)

Learning Outcomes



At the end of the course, students should be able to:

1. define key terms used in ethnopharmacology and appreciate historical perspective of ethnopharmacology;
2. discuss the process (various stages) of drug discovery using ethnopharmacology approach;
3. appreciate the values and challenges/issues of drug discovery from natural products; and
4. discuss the WHO traditional medicine strategies to address the challenges/issues.

Course Contents

Definitions, historical and religious basis of ethnomedicine – The medicine of Avicenna, Esculapius and Galen. Key events in the development of modern Pharmacy including examples of important drugs developed from ethnopharmacology (the Calabar bean, South American arrow poison, Coca chewing and opium poppy smoking of the American Indians and many others). Race and cultural influence of traditional medicine, Herbal medicine and orthodox medicine – Homeopath; Naturopaths, Chinese acupuncture African Medicine. Socio-economic, politico-religious and technological influence on drug development and medical practice. Process of drug discovery using ethnopharmacology (information sources, extraction (solvent consideration and process), scientific investigation (tests for biological activity, bioassay, clinical trial). Challenges/issues of drug discovery from natural products (in collection, extraction and preparation, biological variation, loss of species, loss of knowledge, issues of Intellectual Property Rights) and desirability or not of merging orthodox and traditional medical practices. WHO strategy to address the challenges. The African pharmacopoeia.

PHA 406: Seminars in Pharmacology

(2 Units C: LH 30)

Seminars engage students in the integrated activities of reading, research, discussion, and composition around a particular subject.

Learning Outcomes

At the end of the course, students should be able to:

1. search literature, evaluate, credit and synthesise sources;
2. perform close and critical reading of their work and those of others;
3. analyse a piece of writing through the process of revision in order to get ideas clearly and communicate effectively in class discussion;
4. team up with colleagues as they work on chosen/assigned projects;
5. develop organisational and time management skills; and
6. appreciate the concept of PowerPoint presentation (oral presentation skills) and related applications.

Course Contents

Each student will be assigned topics in different areas of /issues in Pharmacology to review and present same at seminars. Students are expected to attend all Departmental Seminars.



PHA 407: Projects in Pharmacology

(4 Units C: PH 180)

Learning Outcomes

At the end of the course, students should be able to:

1. discuss the scientific area of interest;
2. apply research techniques learnt in pharmacology research classes;
3. appreciate how to search for literature relevant to topical interest;
4. critically appraise research papers; and
5. produce a dissertation and orally present it.

Course Contents

The dissertation is a unique opportunity for students to carry out hypothesis-driven research in different areas of pharmacology under the supervision of academic staff. Oral presentations of the project are required (internal and external defence).

PHA 408: Vitamins and Nutritional Haemopoietic Agents

(1 Unit C: LH 15)

Learning Outcomes

At the end of the course, students should be able to:

1. classify vitamins and discuss health conditions that warrant use of vitamin supplements for patients;
2. list the cellular components of blood;
3. explain the mechanism of action, adverse effects and contraindications of vitamins/dietary supplements used in the treatment of haematological disorders; and
4. explain the pharmacology of anticoagulants, antiplatelet and thrombolytic agents.

Course Contents

Water Soluble Vitamins. Fat soluble Vitamins. Anaemias. Drugs used in the treatment of different types (megaloblastic and Pernicious) of anaemia. Anti-coagulants Antithrombotic and Thrombotic Agents. Management of haemorrhage.

Practical: Bleeding and Coagulation times, blood composition (Cell Numbers and plasma volume), the effect of heparin on coagulation time will be assessed, fibrin clot formation and dissolution.

PHA 409: Quantitative Pharmacology

(2 Units C: LH 15; PH 45)

Learning Outcomes

At the end of the course, students should be able to:

1. explain the most commonly used quantitative models in pharmacology; and
2. use biostatistics in the design, collection, summarisation, analysis and interpretation of data in pharmacology experiments.



Course Contents

Introduction: Drug – receptor interaction; affinity and [intrinsic activity; occupancy theory; Rate Theory; Drug receptor interactions; law of mass action, enzyme-substrate interaction. dose-response relationship – Graphical and Derivation of receptor affinity PD_2 ; Competitive Antagonism. The Gaddum-Schild Equation for Affinity constant of competitive antagonists; Non-competitive antagonism, Partial agonist; Competitive non-competitive antagonism. Pharmacodynamic prediction from pharmacokinetic data (one compartment model). Receptor desensitisation, Mechanisms of Post-receptor transduction. Introduction to Biostatistics, Normal distribution, Mean probit transformation, standard Deviation and standard Error. T-tests paired and unpaired, chi-square Test, Analysis of variance, Poisson Distribution.

Physiology and Pharmacology courses are the minor and major courses in a BSc Pharmacology programme worldwide. Students must therefore be well grounded in them upon graduation to be able to pursue a successful career.

Physiology provides the theoretical basis of normal body function while pharmacology explains how drugs and chemicals exert correction in situations of altered physiology. These two courses transverse all organs/systems of the human body and span 200 to 400 Levels of the BSc Pharmacology programme.



Minimum Academic Standards

Equipment

There shall be state-of-the-art items of laboratory equipment for effective teaching, learning and research.

In addition to the basic laboratory equipment, the following items should be provided to facilitate practical classes and research

1. Microdynamometers
2. Activity meters
3. Analgesimeter
4. Plethysmometer
5. Langendorff/Heart Preparation Apparatus
6. ECG/EEG Machine
7. 2-channel physiograph
8. Data acquisition system
9. Polygraph – 4 channels and accessories
10. Stereotaxic equipment
11. Activity and metabolic cages
12. Electroshock machine
13. Glucometers
14. Bloodless BP monitor
15. Refrigerated Centrifuge
16. Rotary Evaporator
17. Bronchospasm machine
18. Rota rod Apparatus
19. Hole Board machine
20. UV Spectrophotometer
21. Microhematocrit centrifuge
22. Vitalograph
23. Centrifuge
24. Small animal operating table
25. Small animal holder
26. Animal cages

Staffing

The University shall have adequate human and physical resources before commencement of the programme.

The staff/student ratio is specified under different categories of staff. This will provide the necessary student/staff contact to enhance the learning process especially with the clinical core of the programme which follows after the relevant pre-requisite laboratory classes' exposure.

For quality assurance in pharmacy education, the faculty staff should be provided with adequate opportunity for development, commitment to research and scholarship.



Academic Staff

Based on students' enrolment, the minimum academic staff ratio should be 1:15.

Full time academic staff should have a second degree or advance professional qualification primarily to ensure adequate acceptance of the concept goals and objectives of the degree programme.

For Graduate Assistants or Teaching Assistants, a minimum of first degree is required.

The following are the recommended minimum academic staff mix:

| | |
|----------------------|-----|
| Professors/Readers | 25% |
| Senior Lecturer | 30% |
| Lecturer I and below | 45% |

General considerations – Academic staff

The minimum number of teachers to start a Pharmacology Programme should be seen in respect of student in-take.

1. All teachers involved in the programme must contribute to and be familiar with it apart from
2. being involved in the machinery for planning and reviewing the programme.
3. Staff should include persons experienced both in teaching and in providing patient care with appropriate balance to provide the desired spectrum of knowledge.
4. Academic Staff for the programme must be holders of Ph.D. degrees provided that staff with lower qualification can be accommodated under the staff development programme. However, staff with Ph.D. should not be less than 50% of total staff on ground.
5. Staff assignments and expectations should provide for a balance of teaching, service, research and administrative responsibility.

Technical staff

In order to meet the demands of rational equipment selection and maintenance, as well as other operational needs of the programme, the NUC guidelines should be adopted but the level of expertise of the technologists must be seen in respect of the development of the institution.

However, the desired minimum ratio of technical staff to academic staff should be 4:1.

It is desirable to have a central workshop to service the whole faculty.

Administrative and Secretarial Service

Generally, non-teaching administrative support should be provided in a relative proportion to academic staff.

Library

There shall be a well-equipped library with sufficient reading space and adequate supply of up-to-date journals, periodicals and reference text books

Departmental library and reading room shall be provided.

There shall be a virtual library with modern ICT facilities and internet connectivity.



Classrooms, Laboratories and Office Spaces

Classroom

The standard requirement of 0.65m² per full-time student should be maintained. Thus the minimum total space requirement for a faculty or department shall be the product of its total full time equivalent student enrolment (FTE) and the minimum space requirement per full-time equivalent i.e. (FTE) 0.65m².

Office

In this respect, each academic staff should have an office space of at least 25 square metres taking into cognisance the status/cadre of the staff

In addition, there should be for the Faculty, a Dean's office and for each Department a Head of Department's office with attached offices for their supporting staff as specified below in m²:

| | | |
|----------------------------------|---|-------|
| Professor's office | - | 18.50 |
| Head of Department's office | - | 18.50 |
| Tutorial teaching staff's office | - | 13.50 |
| Other teaching staff space | - | 7.00 |
| Technical staff space | - | 7.00 |
| Secretarial space | - | 7.00 |
| Staff research laboratory | - | 16.50 |
| Seminar Space/per student | - | 1.85 |
| Laboratory space (per student) | - | 7.50 |

Academic and administrative equipment

There must be adequate (quality and quantity) teaching and research facilities:

Such as Audio -Visual Materials (AVMs)
For tutorials and seminars
For laboratory investigation/practice
For project writing and presentation /defence
For research methods and instrumentation.



DPT. Physiotherapy

Overview

The Degree Doctor of Physiotherapy (DPT) is a 6-year University training programme in Physiotherapy leading to the award of an entry-level degree of Doctor of Physiotherapy denoted DPT, with or without distinctions in core subject areas. The programme shall domicile in any of the respective University's Faculty of Physiotherapy; OR Faculty of Medical Rehabilitation Sciences OR Faculty of Health and Rehabilitation Sciences; OR School of Physiotherapy.

Graduates shall be eligible for registration to practice physiotherapy in Nigeria and elsewhere by the licensing authorities such as the Medical Rehabilitation Therapists Registration Board of Nigeria. Graduates from this programme shall be awarded an unclassified DPT degree as a Pass or Pass with distinction.

Philosophy

The scope of physiotherapy covers the four core-areas of disease/injury prevention, health promotion, curative and rehabilitation. The philosophy is to train and produce highly knowledgeable, clinically skilled and culturally competent Physiotherapists who can meet the present and future health and functional needs of the people. This philosophy upholds the dignity of human kind, the right of quality health care services and the potential of the individual as a consumer to actively participate in the health care process. The holders of the DPT degree shall be intellectually competent to apply the knowledge skills acquired during this degree training and engage in continuing professional knowledge development activities aimed at broadening their scope in improving and maintaining functional independence and physical performance of the populace.

Objectives

The general objectives of the DPT degree programme is to train Physiotherapy Professionals equipped with adequate theoretical and practical scientific knowledge, physiotherapy clinical skills, administrative knowledge, leadership skills, sense of purpose and devotion to patient care. The specific aims and objectives are to produce a Physiotherapist that will possess ability to:

1. apply the acquired knowledge and skills to render services as an effective direct access, that is first-contact health care provider;
2. independently assess a patient in order to arrive at a definitive physical diagnosis, plan and render physiotherapy intervention according to the patient's clinical state;
3. render evidence-based clinical physiotherapy services in traditional hospital/clinical settings as an autonomous health care professional within the health team; in rehabilitation facilities and other health care establishments;
4. render evidence-based clinical physiotherapy services in community and primary health care centres, as well as itinerant physiotherapy services;
5. render requisite services at physiotherapy training institutions, research centres and other academic environments (after undergoing relevant postgraduate training);
6. provide health promotions services in sports teams and organisations, physical fitness centre and health promotion facilities; industrial workplace and other occupational environments;
7. apply the learned knowledge, and acquire further trainings in health policies, health management and administration, socio-cultural health issues and global health issues.



8. develop and maintain rapport with professional colleagues, patients, their relatives and members of the health care team; and
9. engage in basic and applied research activities as a means of continuing professional development and professional enhancement.

Unique Features of the Programme

The unique features of Doctor of Physiotherapy are the followings:

1. the name/title of the degree program i.e. Doctor of Physiotherapy;
2. the curriculum covers eleven (11) specialty areas in physiotherapy profession;
3. bridge model of clinical education organisation;
4. concurrency of classroom lectures and clinical instructions/posting; and
5. the professional role of physiotherapy in disasters management

Employability Skills

1. Professional judgement and accountability
2. Clinical physiotherapy skills across various health conditions
3. Field physiotherapy skills such as sports and industrial physiotherapy
4. Competency to make fitness for job and return-to-work assessment and determination
5. Management and leadership skills including ability to carry out manpower and resource-planning, supervise and manage staff and effective management of healthcare resources
6. Communication skills and information dissemination

21st Century Skills

1. Collaboration and team work
2. Creativity and imagination
3. Critical thinking
4. Problem solving
5. Flexibility and adaptability
6. Information Literacy
7. Leadership
8. Civic literacy and citizenship
9. Social responsibility
10. Technology literacy
11. Initiative

Admissions and Graduation Requirements

The admission requirements into the programme is as contained under general issues for the Allied Health Sciences Disciplines.

The entry-level Doctor of Physiotherapy degree training shall normally span six academic sessions (12 semesters) for candidates admitted through the Unified Tertiary Matriculation Examination (UTME); and five academic sessions (10 semesters) for candidates admitted by Direct Entry. The three modes of admission into the DPT degree programme are as stated below:



Six-Year Degree Programme (Unified Tertiary Matriculation Examination)

1. In addition to UTME requirements, prospective student for the DPT degree programme must satisfy the minimum entry requirements as may be prescribed by the respective Senate of the University offering the degree programme.
2. Candidates for admission into the 100 level of study must have a minimum of 5 credit passes in Physics, Chemistry, Biology, Mathematics and English language at Senior Secondary Certificate Examination (SSCE) or General Certificate of Education (GCE 'O' Level) or its equivalents.

Direct Entry

Candidates with a Bachelor's degree in related Health Sciences disciplines (other than Physiotherapy) from reputable universities recognised by the Senate of the University offering the DPT programme OR candidates holding the General Certificate of Education (G.C.E. Advanced level) or its recognised equivalents passes in Physics, Chemistry and Biology may be admitted into 200 level of study. Such candidates must also satisfy conditions stipulated in a (2) above.

Transition to Doctor of Physiotherapy (DPT):

1. A candidate who possesses a Bachelor of Science (B.Sc.) Physiotherapy or Bachelor of Physiotherapy (B. Physiotherapy) or a Bachelor of Medical Rehabilitation (BMR) degree in Physiotherapy or its equivalent may be admitted into the DPT degree programme at the **500 Level of study.**
2. In addition to item above, such candidate must hold a current license to practice physiotherapy in Nigeria

Graduation Requirements and Award of Doctor of Physiotherapy Degree

To be eligible for the award of DPT degree, a student must have passed all the prescribed courses and satisfy the professional conduct as required for registration with the Medical Rehabilitation Therapists (Registration) Board of Nigeria. Throughout the course of study, the student is required to maintain a professional code of conduct as embodied in the fundamental ethical principles of the physiotherapy profession. The Department of Physiotherapy offering the course will serve as a guardian of these principles on behalf of the Board. The Department would recommend successful candidates to the University Senate through the Faculty for the award of Doctor of Physiotherapy degree.

Attainment levels

The degree shall be unclassified. Excellence shall be recognised through the awards of distinction and prizes.

Evaluation

Methods for course evaluation

All courses taught during each semester shall be examined at the end of each semester, EXCEPT the clinical practice courses that shall be examined with external moderation at the end of each session.

Continuous Assessments shall constitute 30%-40% of marks of all courses, while examination at the end of the semester in which the course is taken will constitute 60%-70% of the marks.



Examination regulations

1. The Pass mark for ALL Department of Physiotherapy-based courses, the prescribed courses in Anatomy, Physiology, and Biochemistry, as well as ALL courses from 300 to 600 levels of the training shall be **50%**.
2. The pass mark shall be 45% or as may be applicable for other courses to be taken by the students on the DPT programme
3. Distinction grade shall be awarded in each area of specialisation in physiotherapy to a candidate who scores an average of 70% in courses that constitute the areas of specialisation in Physiotherapy, provided that the candidate obtained a minimum mark of 70% in each of the relevant courses

Global Course Structure

Preamble

Courses shall be provided leading to the degree of Doctor of Physiotherapy (DPT), which may be awarded to students who have successfully fulfilled all academic requirements and whose conduct conform to ethics that expected of a prospective Physiotherapist. Physiotherapy training shall be a combination of teacher-directed, tutor-guided, self-learning and problem-based methods as well as hands-on including bed-side teaching and laboratory activities.

Course structure

1. The non-physiotherapy subject's areas to be covered shall include, but not limited to the following: Physics, Chemistry, Biology, Mathematics, Computer Science, Gross Anatomy and Histology, Physiology, Biochemistry, Pathology, Pharmacology, Biostatistics, Medical Sociology, Psychology, Nutrition and Dietetics
2. The period of teaching and learning at "a" above represents the Pre-Clinical Phase of the programme
3. The physiotherapy modalities and basic procedure courses are taught at the 300 level. This is the Physiotherapy Introductory Phase
4. Clinical Phase of the training where application of basic procedures in managing specific clinical conditions runs from 400 to 600 level of the training
5. No student shall be allowed to proceed to the Clinical Phase of the training until all the
6. Prescribed courses have been satisfactorily passed.

100 Level

| Course Code | Course Title | Unit(s) | Status | LH | PH |
|-------------|--------------------------------|---------|--------|----|----|
| GST 111 | Communication in English | 2 | C | 15 | 45 |
| GST 112 | Nigerian Peoples and Culture | 2 | C | 30 | - |
| BIO 101 | General Biology I | 2 | C | 30 | - |
| BIO 102 | General Biology II | 2 | C | 30 | - |
| BIO 107 | General Biology Practical I | 1 | C | - | 45 |
| BIO 108 | General Biology Practical II | 1 | C | - | 45 |
| CHM 101 | General Chemistry I | 2 | C | 30 | - |
| CHM 102 | General Chemistry II | 2 | C | 30 | - |
| CHM 107 | General Chemistry Practical I | 1 | C | - | 45 |
| CHM 108 | General Chemistry Practical II | 1 | C | - | 45 |
| PHY 101 | General Physics I | 2 | C | 30 | - |
| PHY 102 | General Physics II | 2 | C | 30 | - |



| | | | | | |
|---------|------------------------------|-----------|---|---|----|
| PHY 107 | General Physics Practical I | 1 | C | - | 45 |
| PHY 108 | General Physics Practical II | 1 | C | - | 45 |
| | Total | 22 | | | |

200 Level

| Course Code | Course Title | Unit(s) | Status | LH | PH |
|-------------|---|-----------|--------|----|----|
| GST 212 | Philosophy, Logic and Human | 2 | C | 30 | - |
| ENT 211 | Entrepreneurship and Innovation | 2 | C | 30 | - |
| ANA 201 | Anatomy of Upper and Lower Limbs | 3 | C | 30 | 45 |
| ANA 204 | Gross Anatomy of Thorax, Abdomen, Pelvis and Perineum | 3 | C | 30 | 45 |
| BCH 201 | General Biochemistry I | 2 | C | 30 | - |
| PIO 201 | Introductory Physiology and Blood | 2 | C | 30 | - |
| PIO 305 | Neurophysiology I | 2 | C | 30 | - |
| PHY 201 | Electrophysics-I | 2 | C | 30 | - |
| ANA 302 | Neuroanatomy | 2 | C | 30 | - |
| PIO 214 | Introduction to Cardiovascular and Respiratory Physiology | 2 | C | 30 | - |
| PHY 202 | Electrophysics-II | 2 | C | 30 | - |
| | Total | 22 | | | |

300 Level

| Course Code | Course Title | Unit(s) | Status | LH | PH |
|-------------|--|---------|--------|----|----|
| GST 312 | Peace and Conflict Resolution | 2 | C | 30 | - |
| ENT 312 | Venture Creation | 2 | C | 15 | 45 |
| PST 311 | Introduction to Physiotherapy | 2 | C | 15 | 45 |
| PST 312 | Exercise Physiology | 2 | C | 15 | 45 |
| PST 313 | Electrotherapy I: Direct and Low Frequency Currents | 2 | C | 30 | - |
| PST 314 | Practical Electrotherapy I | 1 | C | - | 45 |
| PST 315 | Kinesiology and Pathokinesiology | 2 | C | 30 | - |
| PST 316 | Massage | 2 | C | 15 | 45 |
| PST 317 | Exercise Therapy I: Introduction to | 2 | C | 30 | - |
| PST 320 | Exercise Therapy II: Therapeutic | 2 | C | 15 | 45 |
| PST 321 | Practical Exercise Therapy, Kinesiology & Cryotherapy | 1 | C | - | 45 |
| PST 322 | Electrotherapy II: Thermal & Radiation Agents in Physiotherapy | 2 | C | 30 | - |
| PST 323 | Electrotherapy III: High Frequency Currents | 2 | C | 30 | - |
| PST 324 | Practical Electrotherapy II | 1 | C | - | 45 |
| PST 325 | Cryotherapy and Hydrotherapy | 2 | C | 30 | - |



| | | | | | |
|---------|---------------------------|----|---|----|---|
| PST 326 | Orthotics and Prosthetics | 2 | C | 30 | - |
| | Total | 29 | | | |

400 Level

| Course Code | Course Title | Unit(s) | Status | LH | PH |
|-------------|--|-----------|--------|----|----|
| PST 411 | Physiotherapy in Women's Health | 2 | C | 30 | - |
| PST 412 | Musculoskeletal Injuries and Rehabilitation | 2 | C | 30 | - |
| PST 413 | Physiotherapy Clinical Rotation in Orthopaedics and Traumatology | 2 | C | - | 90 |
| PST 414 | Health Management and Outcome Assessments | 2 | C | 30 | - |
| PST 415 | Physiotherapy in Pain Management | 2 | C | 30 | - |
| PST 416 | Physiotherapy in Infectious Diseases Control and Prevention | 1 | C | 15 | |
| PST 421 | Neurological physiotherapy -I | 2 | C | 30 | - |
| PST 422 | Physiotherapy Clinical Rotation in Neurology-1 | 2 | C | - | 90 |
| PST 423 | Special Topics in Health Seminar | 1 | C | - | 45 |
| PST 424 | Sports and Recreational Physiotherapy | 2 | C | - | 45 |
| PST 425 | Psychiatry and Mental Health | 2 | C | 15 | 15 |
| PST 426* | Clinical Practice –I (Neurophysiotherapy and Musculoskeletal) | 1 | C | - | - |
| | Total | 21 | | | |

PST 426* is the External Examiner- moderated Professional Clinical Examination for all Clinical courses PST 413, PST 422



500 Level

| Course Code | Course Title | Unit(s) | Status | LH | PH |
|-------------|---|-----------|--------|----|----|
| PST 511 | Neurological Physiotherapy-II | 2 | C | 30 | - |
| PST 512 | Physiotherapy Clinical Rotation in Neurology-II | 2 | C | - | 90 |
| PST 513 | Research Methods | 2 | C | 30 | - |
| PST 514 | Biostatistics | 2 | C | 30 | - |
| PST 515 | Spinal and Peripheral Joint | 2 | C | 30 | - |
| PST 516 | Ergonomics and Occupational Health | 2 | C | 30 | - |
| PST 521 | Physiotherapy in Geriatrics | 2 | C | 30 | - |
| PST 522 | Research Proposal Seminar | 2 | C | 30 | - |
| PST 523 | Community Based Physiotherapy and Primary Health Care | 2 | C | 30 | - |
| PST 524 | Paediatric physiotherapy | 2 | C | 30 | - |
| PST 525 | Physiotherapy Clinical Rotation in Paediatrics | 2 | C | - | 90 |
| PST 526* | Clinical Practice –II | 1 | C | - | - |
| | Total | 23 | | | |

PST 526* is the External Examiner-Moderated Professional Clinical Examination for Clinical courses PST 512, PST 525

600 Level

| Course Code | Course Title | Unit(s) | Status | LH | PH |
|-------------|---|-----------|--------|----|-----|
| PST 601 | Research Project | 3 | C | - | 135 |
| PST 611 | Cardiorespiratory Physiotherapy | 2 | C | 30 | - |
| PST 612 | Physiotherapy Clinical Rotation in Cardiopulmonary and Intensive Care | 2 | C | - | 90 |
| PST 613 | Principles of Management And Administration For Physiotherapy | 2 | C | 30 | - |
| PST 614 | Physiotherapy in Oncology and alliative Care | 2 | C | 30 | - |
| PST 621 | Physical Fitness in Health and Disease | 2 | C | 20 | 45 |
| PST 622 | Summative Physiotherapy Clinical | 2 | C | - | 90 |
| PST 623* | Clinical Practice –III | 1 | C | - | - |
| PST 624 | Disability Issues | 1 | C | 15 | - |
| PST 625 | Physiotherapy in Integumentary and Skin care | 1 | C | 15 | - |
| | Total | 18 | | | |

PST 623* is the External Examiner-Moderated Professional Clinical Examination for clinical courses PST 612, PST 622



Course Contents and Learning Outcomes

100 Level

GST 111: Communication in English

(2 Units C: LH 15; PH 45)

Learning Outcomes

At the end of the course, the students should be able to

1. identify possible sound patterns in English Language;
2. list notable Language skills;
3. classify word formation processes;
4. construct simple and fairly complex sentences in English;
5. apply logical and critical reasoning skills for meaningful presentations;
6. demonstrate an appreciable level of the art of public speaking and listening; and
7. write simple and technical reports.

Course Contents

Sound patterns in English Language (vowels and consonants, phonetics and phonology). English word classes (lexical and grammatical words, definitions, forms, functions, usages, collocations). Sentence in English (types: structural and functional, simple and complex). Grammar and Usage (tense, mood, modality and concord, aspects of language use in everyday life). Logical and Critical Thinking and Reasoning Methods (Logic and Syllogism, Inductive and Deductive Argument and Reasoning Methods, Analogy, Generalisation and Explanations). Ethical considerations, Copyright Rules and Infringements. Writing Activities: (Pre-writing, Writing, Post writing, Editing and Proofreading; Brainstorming, outlining, Paragraphing, Types of writing, Summary, Essays, Letter, Curriculum Vitae, Report writing, Note making and many others. Mechanics of writing). Comprehension Strategies: (Reading and types of Reading, Comprehension Skills, 3RsQ). Information and Communication Technology in modern Language Learning. Language skills for effective communication. Major word formation processes. Writing and reading comprehension strategies. Logical and critical reasoning for meaningful presentations. Art of public speaking and listening.

GST 112: Nigerian Peoples and Culture

(2 Units C: LH 30)

Learning Outcomes

At the end of the course, the students should be able to

1. analyse the historical foundation of the Nigerian culture and arts in pre-colonial times;
2. list and identify the major linguistic groups in Nigeria;
3. explain the gradual evolution of Nigeria as a political unit;
4. analyse the concepts of Trade, Economic and Self-reliance status of the Nigerian peoples towards national development;
5. enumerate the challenges of the Nigerian State towards Nation building
6. analyse the role of the Judiciary in upholding people's fundamental rights
7. identify acceptable norms and values of the major ethnic groups in Nigeria; and
8. list and suggest possible solutions to identifiable Nigerian environmental, moral and value problems.



Course Contents

Nigerian history, culture and art up to 1800 (Yoruba, Hausa and Igbo peoples and culture; peoples and culture of the ethnic minority groups). Nigeria under colonial rule (advent of colonial rule in Nigeria; Colonial administration of Nigeria). Evolution of Nigeria as a political unit (amalgamation of Nigeria in 1914; formation of political parties in Nigeria; Nationalist movement and struggle for independence). Nigeria and challenges of nation building (military intervention in Nigerian politics; Nigerian Civil War). Concept of trade and economics of self-reliance (indigenous trade and market system; indigenous apprenticeship system among Nigeria people; trade, skill acquisition and self-reliance). Social justices and national development (law definition and classification. Judiciary and fundamental rights. Individual, norms and values (basic Nigeria norms and values, patterns of citizenship acquisition; citizenship and civic responsibilities; indigenous languages, usage and development; negative attitudes and conducts. Cultism, kidnapping and other related social vices). Re-orientation, moral and national values (The 3R's – Reconstruction, Rehabilitation and Re-orientation; Re-orientation Strategies: Operation Feed the Nation (OFN), Green Revolution, Austerity Measures, War Against Indiscipline (WAI), War Against Indiscipline and Corruption (WAIC), Mass Mobilisation for Self-Reliance, Social Justice and Economic Recovery (MAMSER), National Orientation Agency (NOA). Current socio-political and cultural developments in Nigeria.

BIO 101: General Biology I

(2 Units C: LH 30)

Learning Outcomes

At the end of this course, students should be able to:

1. explain cell's structure and organisations;
2. summarise functions of cellular organelle;
3. characterise living organisms and state their general reproduction;
4. describe the interrelationship that exists between organisms;
5. discuss the concept of heredity and evolution; and
6. enumerate habitat types and their characteristics.

Course Contents

Cell structure and organisation. functions of cellular organelles. characteristics and classification of living things. chromosomes, genes their relationships and importance. General reproduction. Interrelationships of organisms (competitions, parasitism, predation, symbiosis, commensalisms, mutualism, saprophytism). Heredity and evolution (introduction to Darwinism and Lamarckism, Mendelian laws, explanation of key genetic terms). Elements of ecology and types of habitat.

BIO 102: General Biology II

(2 Units C: LH 30)

Learning Outcomes

At the end of the lectures, students should be able to:

1. List the characteristics, methods of identification and classification of Viruses, bacteria and fungi;
2. state the unique characteristics of plant and animal kingdoms;
3. describe ecological adaptations in the plant and animal kingdoms;
4. explain nutrition, respiration, excretion and reproduction in plants and animals; and
5. describe growth and development in plants and animals.

Course Contents



Basic characteristics, identification and classification of viruses, bacteria and fungi. A generalised survey of the plant and animal kingdoms based mainly on the study of similarities and differences in the external features. Ecological adaptations. Briefs on physiology to include nutrition, respiration, circulatory systems, excretion, reproduction, growth and development.

BIO 107: General Biology Practical I

(1 Unit C: PH 45)

Learning Outcomes

At the end of the course, students should be able to:

1. outline common laboratory hazards;
2. provide precautions on laboratory hazards;
3. state the functions of the different parts of microscope;
4. use the microscope and describe its maintenance;
5. draw biological diagrams and illustrations; and
6. apply scaling and proportion to biological diagrams.

Course Contents

Common laboratory hazards: prevention and first aid. Measurements in biology. Uses and care of microscope. Compound and dissecting microscope. Biological drawings and illustration, scaling, accuracy and proportion; use of common laboratory apparatus and laboratory experiments designed to illustrate the topics covered in BIO 101.

BIO 108: General Biology Practical II

(1 Unit C: PH 45)

Learning Outcomes

At the end of the course, students should be able to:

1. describe the anatomy of flowering plants;
2. differentiate types of fruit and seeds;
3. state ways of handling and caring for biological wares;
4. describe the basic histology of animal tissues; and
5. identify various groups in the animal kingdom.

Course Contents

Anatomy of flowering plants, primary vegetative body: stem, leaf and root to show the mature tissues namely parenchyma, collenchyma, sclerenchyma, xylem and phloem. Types of fruits and seeds. Care and use of dissecting kits and other biological wares. Dissection and general histology of animal tissues based on vertebrate forms. Morphology and functions of epithelial, muscular, nervous and connective tissues. Examination of various groups of lower invertebrates under microscopes, identification of various groups of organisms in Animal Kingdom. And any experiment designed to emphasise the practical aspects of topics in BIO 102.



CHM 101: General Chemistry I

(2 Units C: LH 30)

Learning Outcomes

At the end of this course, the students should be able to:

1. define atom, molecules and chemical reactions;
2. discuss the Modern electronic theory of atoms;
3. write electronic configurations of elements on the periodic table;
4. rationalise the trends of atomic radii, ionization energies, electronegativity of the elements based on their position in the periodic table;
5. identify and balance oxidation – reduction equation and solve redox titration problems.
6. draw shapes of simple molecules and hybridized orbitals;
7. identify the characteristics of acids, bases and salts, and solve problems based on their quantitative relationship;
8. apply the principles of equilibrium to aqueous systems using Le Chatelier's principle to predict the effect of concentration, pressure and temperature changes on equilibrium mixtures;
9. analyse and perform calculations with the thermodynamic functions, enthalpy, entropy and free energy; and
10. determine rates of reactions and its dependence on concentration, time and temperature.

Course Contents

Atoms, molecules and chemical reactions. Modern electronic theory of atoms. Electronic configuration, periodicity and building up of the periodic table. Hybridization and shapes of simple molecules. Valence Forces. Structure of solids. Chemical equations and stoichiometry. Chemical bonding and intermolecular forces. Kinetic theory of matter. Elementary thermochemistry. Rates of reaction. Equilibrium and thermodynamics. Acids, bases and salts. Properties of gases. Redox reactions and introduction to electrochemistry. Radioactivity.

CHM 102: General Chemistry II

(2 Units C: LH 30)

Learning Outcomes

At the end of this course, the students should be able to:

1. state the importance and development of organic chemistry;
2. define fullerenes and its applications;
3. discuss electronic theory;
4. determine the qualitative and quantitative of structures in organic chemistry;
5. describe rules guiding nomenclature and functional group classes of organic chemistry;
6. determine rate of reaction to predict mechanisms of reactions;
7. identify classes of organic functional group with brief description of their chemistry;
8. discuss comparative chemistry of group 1A, IIA and IVA elements; and
9. describe basic properties of Transition metals.



Course Contents

Historical survey of the development and importance of Organic Chemistry. Fullerenes as fourth allotrope of carbon, uses as nanotubules, nanostructures, nanochemistry. Electronic theory in organic chemistry. Isolation and purification of organic compounds. Determination of structures of organic compounds including qualitative and quantitative analysis in organic chemistry. Nomenclature and functional group classes of organic compounds. Introductory reaction mechanism and kinetics. Stereochemistry. The chemistry of alkanes, alkenes, alkynes, alcohols, ethers, amines, alkyl halides, nitriles, aldehydes, ketones, carboxylic acids and derivatives. The Chemistry of selected metals and non-metals. Comparative chemistry of group IA, IIA and IVA elements. Introduction to transition metal chemistry.

CHM 107: General Chemistry Practical I

(1 Unit C: PH 45)

Learning Outcomes

At the end of the course the students should be able to:

1. state the general laboratory rules and safety procedures;
2. collect scientific data and correctly carrying out Chemical experiments;
3. identify the basic glassware and equipment in the laboratory;
4. state the differences between primary and secondary standards;
5. perform redox titration;
6. recording observations and measurements in the laboratory notebooks; and
7. analyse the data to arrive at scientific conclusions.

Course Contents

Laboratory experiments designed to reflect topics presented in courses CHM 101 and CHM 102. These include acid-base titrations, qualitative analysis, redox reactions, gravimetric analysis, data analysis and presentation.

CHM 108: General Chemistry Practical II

(1 Unit C: PH 45)

Learning Outcomes

At the end of this course, the students should be able to:

1. identify the general laboratory rules and safety procedures;
2. collect scientific data and correctly carrying out Chemical experiments;
3. identify the basic glassware and equipment in the laboratory;
4. identify and carry out preliminary tests which includes ignition, boiling point, melting point, test on known and unknown organic compounds;
5. perform solubility tests on known and unknown organic compounds;
6. conduct elemental tests on known and unknown compounds; and
7. conduct functional group/confirmatory test on known and unknown compounds which could be acidic / basic / neutral organic compounds.

Course Contents

Continuation of CHM 107. Additional laboratory experiments to include functional group analysis, quantitative analysis using volumetric methods.



PHY 101: General Physics I (Mechanics)

(2 Units C: LH 30)

Learning Outcomes

At the end of the course, student should be able to;

1. identify and deduce the physical quantities and their units;
2. differentiate between vectors and scalars;
3. describe and evaluate motion of systems on the basis of the fundamental laws of mechanics;
4. apply Newton's laws to describe and solve simple problems of motion;
5. evaluate work, energy, velocity, momentum, acceleration, and torque of moving or rotating objects;
6. explain and apply the principles of conservation of energy, linear and angular momentum;
7. describe the laws governing motion under gravity; and
8. explain motion under gravity and quantitatively determine behaviour of objects moving under gravity.

Course Contents

Space and time. Units and dimension, Vectors and Scalars. Differentiation of vectors: displacement, velocity and acceleration. Kinematics. Newton laws of motion (Inertial frames, Impulse, force and action at a distance, momentum conservation). Relative motion. Application of Newtonian mechanics. Equations of motion. Conservation principles in physics. Conservative forces. Conservation of linear momentum. Kinetic energy and work. Potential energy. System of particles. Centre of mass. Rotational motion: Torque, vector product, moment, rotation of coordinate axes and angular momentum. Polar coordinates. Conservation of angular momentum. Circular motion. Moments of inertia. gyroscopes and precession. Gravitation: Newton's Law of Gravitation. Kepler's Laws of Planetary Motion. Gravitational Potential Energy. Escape velocity. Satellites motion and orbits.

PHY 102: General Physics II (Electricity & Magnetism)

(2 Units C: LH 30)

Learning Outcomes

At the end of this course, the student should be able to:

1. describe the electric field and potential, and related concepts, for stationary charges;
2. calculate electrostatic properties of simple charge distributions using Coulomb's law, Gauss's law and electric potential;
3. describe and determine the magnetic field for steady and moving charges;
4. determine the magnetic properties of simple current distributions using Biot-Savart and Ampere's law;
5. describe electromagnetic induction and related concepts, and make calculations using Faraday and Lenz's laws;
6. explain the basic physical of Maxwell's equations in integral form;
7. evaluate DC circuits to determine the electrical parameters; and
8. determine the characteristics of ac voltages and currents in resistors, capacitors, and Inductors.



Course Contents

Forces in nature. Electrostatics; electric charge and its properties, methods of charging. Coulomb's law and superposition. electric field and potential. Gauss's law. Capacitance. Electric dipoles. Energy in electric fields. Conductors and insulators, current, voltage and resistance. Ohm's law and analysis of DC circuits. Magnetic fields. Lorentz force. Biot-Savart and Ampère's laws. magnetic dipoles. Dielectrics. Energy in magnetic fields. Electromotive force. Electromagnetic induction. Self and mutual inductances. Faraday and Lenz's laws. Step up and step-down transformers: Maxwell's equations. Electromagnetic oscillations and waves. AC voltages and currents applied to inductors, capacitors, resistance, and combinations.

PHY 107: General Practical Physics I

(1 Unit C: PH 45)

Learning Outcomes

At the end of the course, the student should be able to;

1. conduct measurements of some physical quantities;
2. make observations of events, collect and tabulate data;
3. identify and evaluate some common experimental errors;
4. plot and analyse graphs; and
5. draw conclusions from numerical and graphical analysis of data.

Course Contents

This introductory course emphasises quantitative measurements. The treatment of measurement errors, and graphical analysis. A variety of experimental techniques should be employed. The experiments include studies of meters, the oscilloscope, mechanical systems, electrical and mechanical resonant systems. Light. Heat. Viscosity and many others, covered in PHY 101 and PHY 102. However, emphasis should be placed on the basic physical techniques for observation, measurements, data collection, analysis and deduction.

PHY 108: General Practical Physics II

(1 Unit C: PH 45)

Learning Outcomes

At the end of this course, the student should be able to:

1. conduct measurements of some physical quantities;
2. make observations of events, collect and tabulate data;
3. identify and evaluate some common experimental errors;
4. plot and analyse graphs;
5. draw conclusions from numerical and graphical analysis of data; and
6. prepare and present practical reports.

Course Contents

This practical course is a continuation of PHY 107 and is intended to be taught during the second semester of the 100 level to cover the practical aspect of the theoretical courses that have been covered with emphasis on quantitative measurements. The treatment of measurement errors, and graphical analysis. However, emphasis should be placed on the basic physical techniques for observation, measurements, data collection, analysis and deduction.



200 Level

GST 212: Philosophy, Logic and Human Existence

(2 Units C: LH 30)

Learning Outcomes

A student who has successfully gone through this course should be able to:

1. enumerate the basic features of philosophy as an academic discipline;
2. identify the main branches of philosophy & the centrality of logic in philosophical discourse;
3. describe the elementary rules of reasoning;
4. distinguish between valid and invalid arguments;
5. think critically and assess arguments in texts, conversations and day-to-day discussions;
6. critically assess the rationality or otherwise of human conduct under different existential conditions;
7. develop the capacity to extrapolate and deploy expertise in logic to other areas of knowledge, and
8. guide his or her actions, using the knowledge and expertise acquired in philosophy and logic.

Course Contents

Scope of philosophy; notions, meanings, branches and problems of philosophy. Logic as an indispensable tool of philosophy. Elements of syllogism, symbolic logic— the first nine rules of inference. Informal fallacies, laws of thought, nature of arguments. Valid and invalid arguments, logic of form and logic of content — deduction, induction and inferences. Creative and critical thinking. Impact of philosophy on human existence. Philosophy and politics, philosophy and human conduct, philosophy and religion, philosophy and human values, philosophy and character molding and many others.

ENT 211: Entrepreneurship and Innovation

(2 Units C: LH 30)

Learning Outcomes

At the end of this course, students should be able to:

1. explain the concepts and theories of entrepreneurship, intrapreneurship, opportunity seeking, new value creation, and risk taking;
2. state the characteristics of an entrepreneur;
3. analyse the importance of micro and small businesses in wealth creation, employment, and financial independence;
4. engage in entrepreneurial thinking;
5. identify key elements in innovation;
6. describe stages in enterprise formation, partnership and networking including business planning; and
7. describe contemporary entrepreneurial issues in Nigeria, Africa and the rest of the world.
8. state the basic principles of e-commerce.



Course Contents

Concept of Entrepreneurship (Entrepreneurship, Intrapreneurship/Corporate Entrepreneurship). Theories, rationale and relevance of entrepreneurship (Schumpeterian and other perspectives, risk-taking, necessity and opportunity-based entrepreneurship and creative destruction). Characteristics of entrepreneurs (Opportunity seeker, risk taker, natural and nurtured, problem solver and change agent, innovator and creative thinker). Entrepreneurial thinking (Critical thinking, reflective thinking, and creative thinking). Innovation (Concept of innovation, dimensions of innovation, change and innovation, Knowledge and innovation). Enterprise formation, partnership and networking (Basics of business plan, forms of business ownership, business registration and forming alliances and joint ventures). Contemporary entrepreneurship issues (Knowledge, skills and technology, intellectual property, virtual office, networking). Entrepreneurship in Nigeria (Biography of inspirational entrepreneurs, youth and women entrepreneurship, entrepreneurship support institutions, youth enterprise networks and environmental and cultural barriers to entrepreneurship). Basic principles of e-commerce.

ANA 201: Anatomy of Upper & Lower Limbs

(3 Units C: LH 30; PH 45)

Learning Outcomes

At the end of this course, the students should be able to:

1. define fundamental anatomical terminology and discuss the anatomical position;
2. describe the anatomy of the musculoskeletal system, including the axial skeleton; appendicular skeleton, appendicular and axial muscles, and arthrology;
3. describe the general features of the bones of the upper and lower limbs;
4. identify the major muscles of the upper and lower limbs;
5. explain the types and structure of the joints of the upper and lower limbs;
6. correlate between the attachment of the muscles and their functions on the different joints;
7. identify the major nerves of the upper and lower limbs;
8. describe the functional components of each of the major nerves and its distribution;
9. identify and describe the course of the major superficial veins of the upper and lower limbs; and
10. name the major arteries of the upper and lower limbs.

Course Contents

Descriptive terms, planes and terms of relationship of the human body, terms of comparison, attachment of muscles, types of muscles, movements of joints. Osteology, principles of kinesiology, general organisation of body system. Cutaneous innervation of the upper limb; pectoral region; breast; axilla; shoulder region; arm and cubital fossa; flexor compartment of forearm; extensor compartment of forearm; hand; venous and lymphatic drainage of the upper limb. Applied anatomy of nerves; blood supply of the upper limb. Cutaneous innervation of the lower limb; femoral triangle; adductor canal and medial side of the thigh; gluteal region; back of the thigh, popliteal fossa; extensor compartment of the leg and dorsum of the foot; peroneal and flexor compartment of the leg; sole of the foot, arches of the foot; mechanism of walking; venous and lymphatic drainage of the lower limb; applied anatomy of the nerves and blood supply to the lower limb.



ANA 204: Gross Anatomy of Thorax, Abdomen, Pelvis & Perineum (3 Units C: LH 30; PH 45)

Learning Outcomes

At the end of this course, the students should be able to:

1. identify the bones and bony markings of the thorax, abdomen, pelvis and perineum;
2. list the nine regions and four quadrants and the principal organs and structures that lie deep to them and which can be palpated in those region;
3. describe the muscular components of the anterior abdominal wall, blood supply and innervation of the anterior abdominal wall;
4. identify the arteries, veins and lymphatics of the thorax, abdomen, pelvis and perineum; be able to list the main branches of the aorta and their territories; and describe the disposition of the main veins in the abdomen;
5. describe the parts, position, vertebral levels and surface markings of the stomach and duodenum as well as the position, vertebral levels and surface markings of the pancreas, spleen, liver and gall bladder;
6. describe the greater and lesser omenta and the lesser sac;
7. describe the disposition of the jejunum and ileum; describe the surface anatomy of the caecum, ascending colon, transverse colon, descending colon and sigmoid colon;
8. describe the anatomy of the pelvic diaphragm, its midline raphe, perineal body, attachment points and the structures passing through it in males and females;
9. describe the anatomy of the ischio-anal fossa;
10. describe the anatomy and relations of the ovary, uterine tubes, uterus, cervix and vagina, including their peritoneal coverings;
11. describe the anatomy and neurovascular supply of the clitoris, vulva and vagina; the anatomy of the urogenital diaphragm and perineal 'pouches';
12. describe the origin, course and distribution of the pudendal nerves and the sites of pudendal nerve block; and
13. describe the lymphatic drainage of the foregut, pelvic and perineal organs;

Course Contents

Introduction to the trunk; thoracic cage; intercostal space; thoracic cavity; pleural cavities; lungs; mediastinum general; anterior & superior mediastinum; middle; mediastinum – heart and pericardium; heart – applied anatomy; posterior mediastinum. General anatomy of abdomen and abdominal regions; anterior abdominal wall muscles; inguinal canal – inguinal and femoral hernias; peritoneal cavity and spaces; abdominal oesophagus, stomach, duodenum, spleen, small intestine, large intestine, appendix; portal venous system; portocaval anastomoses; liver and gallbladder. Pancreas and biliary apparatus; kidneys, suprarenal glands, and ureters; diaphragm; posterior abdominal wall; aorta and inferior vena cava; posterior abdominal wall muscles; lumbosacral plexus; bony and ligamentous pelvis; pelvic diaphragm (floor); male reproductive organs; female reproductive organs; male and female external genitalia; perineum; rectum and anal canal; pelvic blood vessels; abdomino-pelvic nervous system.



PIO 201: Introductory Physiology and Blood

(2 Units C: LH 30)

Learning Outcomes

At the end of this course, the students should be able to:

1. describe the composition of a cell membrane;
2. explain how a potential difference across a membrane will influence the distribution of a cation and an anion;
3. describe how transport rates of certain molecules and ions are accelerated by specific membrane transport proteins;
4. distinguish between active (primary and secondary) transport, facilitated diffusion, and passive diffusion based on energy source and carrier protein involvement;
5. identify the mechanisms and role of selective transporters for amino acids, neurotransmitters, nutrients, etc.;
6. explain the general concepts of homeostasis and the principles of positive and negative feedback in physiological systems;
7. identify the site of erythropoietin production, the stimulus for its release, and the target tissue for erythropoietin action;
8. discuss the normal balance of red blood cell synthesis and destruction, including how imbalances in each lead to anemia or polycythemia;
9. list and differentiate the various types of leukocytes;
10. describe the role of thrombocytes in haemostasis; and
11. list clotting factors and the discuss the mechanism of anti-coagulants.

Course Contents

Introduction and history of physiology. Structure and functions of cell membranes. Transport process. Special transport mechanism in amphibian bladder, kidney, gall bladder, intestine, astrocytes and exocrine glands. Biophysical principles. Homeostasis and control systems including temperature regulation. Biological rhythms. Composition and functions of blood. Haemopoiesis. WBC and differential count. Plasma proteins Coagulation, fibrinolysis and platelet functions. Blood groups –ABO system – Rh system. Blood transfusion – indication for collection and storage of blood, hazards of blood transfusions. Reticulo- endothelial system. Immunity and immodeficiency disease and HIV.

PIO 305: Neurophysiology I

(2 Units C: LH 30)

Learning Outcomes

At the end of this course, the students should be able to:

1. explain how inhibitory and excitatory post-synaptic potentials can alter synaptic transmission;
2. list the major receptor classifications and representative receptor agonists;
3. describe the cutaneous and proprioceptive mechanoreceptors and their function;
4. describe formation and reabsorption of cerebral spinal fluid (CSF), including the anatomy and function of the choroid plexus;
5. compare and contrast the barrier mechanisms between the blood brain barrier and the blood CSF barrier and the consequences of barrier break down;
6. describe the major areas of the cerebral cortex and their roles in perception and motor coordination. Identify the Brodmann areas for visual, auditory, somatosensory, motor, and speech areas;



7. discuss the pathways for pain/temperature/coarse touch system and its connections to the cerebral cortex;
8. list the neural components of the dorsal column-medial lemniscus system and its trigeminal analogs;
9. describe the functions of the medial and lateral motor pathways and trace their origins and terminations within the spinal cord;
10. describe the physiologic-anatomy of the major ascending tracts (anterolateral and dorsal column-medial lemniscus systems) and descending spinal cord tract (cortico-spinal tract, CST), including crossing of midline;
11. list the functions of the following brainstem reflexes: cardiovascular baroreceptor, respiratory stretch receptor, cough reflex, pupillary light reflex, gag reflex, and blink reflex;
12. explain the role of the brain stem reticular formation in pain perception and modulation, level of consciousness, integration of brainstem reflexes, and the location of noradrenergic, serotonergic, and dopaminergic nuclei;
13. list the physiological functions of the Hypothalamus;
14. list the three functional divisions of the cerebellum, detailing the input and output connections of each;
15. describe how these areas are integrated with the lateral and medial motor pathways;
16. discuss the overall functions of the basal ganglia in the initiation and control of movement;
17. describe how the amygdala interacts with the cerebral cortex to produce cognitive emotional behaviours;
18. describe the three states of human brain activity based on EEG, EOG and EMG recordings; and
19. distinguish the major characteristics of the major seizure disorders: grand mal, Absence seizure (Petite mal), simple partial and complex partial seizures, and status epilepticus.

Course Contents

Functional organisation of CNS. Autonomic neurotransmitters and autonomic effects. Peripheral nervous system. The reflex arc and general properties of reflexes. Receptors and receptor potentials. Cerebrospinal fluid and the blood-brain barrier. The human brain —cerebrum, brain stem, basal ganglia, thalamus, hypothalamus and cerebella. The limbic system. Electrophysiology of the cerebral cortex, the electroencephalogram. Alertness and sleep. Postural regulation and postural reflexes. Speech, learning and memory. Conditioned reflexes and spinal cord transection.



PIO 214: Introduction to Cardiovascular and Respiratory Physiology (3 Units C: LH 45)

Learning Outcomes

At the end of this course, the students should be able to:

1. state Starling's law of the heart and describe the application of the law in keeping the output of the left and right ventricles equal;
2. describe how ionic currents contribute to the four phases of the cardiac action potential;
3. explain the ionic mechanism of pacemaker automaticity and rhythmicity, and identify cardiac cells that have pacemaker potential and their spontaneous rate;
4. identify neural and humoral factors that influence their rate;
5. describe the various phases of ventricular systole and ventricular diastole;
6. describe the timing and causes of the four heart sounds;
7. explain why the ECG tracing looks different in each of the 12 leads;
8. explain the principles underlying cardiac output measurements using the Fick principle, dye dilution, and thermodilution methods;
9. list the factors that shift laminar flow to turbulent flow;
10. describe the relationship between velocity, viscosity, and audible events, such as murmurs and bruits;
11. describe how arterial systolic, diastolic, mean, and pulse pressure are affected by changes in a) stroke volume, b) heart rate, c) arterial compliance, and d) total peripheral resistance;
12. define the Starling equation and discuss how each component influences fluid movement across the capillary wall;
13. list the anatomical components of the baroreceptor reflex;
14. explain three positive feedback mechanisms activated during severe hemorrhage that may lead to circulatory collapse and death;
15. define compliance and identify two common clinical conditions in which lung compliance is higher or lower than normal;
16. list the factors that determine total lung capacity, functional residual capacity, and residual volume;
17. define surface tension and describe how it applies to lung mechanics, including the effects of alveolar size and the role of surfactants;
18. explain how the shape of the oxyhemoglobin dissociation curve influences the uptake and delivery of oxygen;
19. list the forms in which carbon dioxide is carried in the blood; and
20. identify the regions in the central nervous system that play important roles in the generation and control of normal respiration.

Course Contents

The heart; events of the cardiac cycle. Control of cardiac contractility. Cardiac electrophysiology. Properties of cardiac muscles. Cardiac output - measurement and control. Haemodynamics of circulation. Arterial blood pressure and its regulation. Cardiovascular reflexes. Peripheral resistance and local control of the circulation. Regional blood flow. Cardiovascular changes in exercise, haemorrhage and shock. Respiratory physiology – functions of upper respiratory tract. Mechanics of respiration including compliance. Surfactant. Lung volume and capacities. Pulmonary gas exchange. Blood gas transport. Pulmonary function tests. Nervous and chemical control of respiration. Response to hypoxia, high altitude, exercise and artificial respiration.



PHY 201: Electrophysics I

(2 Units C: LH 30)

Learning Outcomes

At the end of this course, the students are expected to:

1. display the basic knowledge of Elementary Kinematics and vector algebra, Newton's laws of motion and Elasticity and strength of materials;
2. be familiar with and the applications of Momentum conservation; application to contusion and fracture during impacts, and to similar medical situations; conservation of energy; the first law of thermodynamics; applications to metabolism and work done by various organs of the body;
3. discuss the principle of Angular momentum and torque and the Harmonic motion and diffusion;
4. explain the applications to osmotic pressure and passage of substances through capillary walls; and
5. describe the principle of Equilibrium in external fields; the centrifuge and measurement of molecular weight.

Course Contents

Elementary Kinematics and vector algebra, Newton's laws of motion., STAic forces acting on a human body, Elasticity and strength of materials, Momentum conservation; application to contusion and fracture during impacts, and to similar medical situations; conservation of energy; the first law of thermodynamics; applications to metabolism and work done by various organs of the body, Angular momentum and torque, Harmonic motion and diffusion, Applications to osmotic pressure and passage of substances through capillary walls, Molecular motion in gases: distribution functions and the Boltzmann principles, Intermolecular collisions and transport processes, Equilibrium in external fields; the centrifuge and measurement of molecular weight.

BCH 201: General Biochemistry I

(2 Units C: LH 30)

Learning outcome:

At the end of the lectures, students should be able to:

1. explain the structure of different macromolecules in biological system;
2. identify types of chemical reactions involving these macromolecules;
3. explain the various methods of isolation of these macromolecules;
4. estimate the effects of acids and alkalis on the macromolecules;
5. describe purification of macromolecules; and
6. quantify the various macromolecules.

Course Contents

Introductory chemistry of amino acids. their properties, reactions and biological functions. Classification of amino acids: neutral, basic and acidic, polar and non-polar, essential and non-essential amino acids. Peptides. Introductory chemistry and classification of proteins. Biological functions of proteins. Methods of their isolation, purification and identification. Primary, secondary, tertiary and quaternary structures of proteins. Basic principles of tests for proteins and amino acids. Introductory chemistry of carbohydrates, lipids and nucleic acids. Nomenclature of nucleosides, and nucleotides; effects of acid and alkali on hydrolysis of nucleic acids.

PHY 202: Electrophysics II

(2 Units C: LH 30)



Learning Outcomes

At the end of this course, the students should be able to:

1. have a good overview of Coulomb's Law, electric fields, Gauss law, the electrostatic potential, Laplace's equation, point charges, continuous charge distributions and dipoles, capacitors, dielectrics and field energy;
2. display knowledge on Theory of electrolytes: Solubility and electrophoresis of proteins, quasi-static flow of charge, distribution of potential in volume conductors.
3. explain the Application of electrocardiography, Magnetic fields, Amperes laws; the law of Biot and Savart and the Magnetic properties of matter.
4. have a good overview and application of Electrical circuits, oscillators, feedback, with application to medical instrumentation e.g pacemakers.

Course Contents

Coulomb's Law, electric fields, Gauss law, the electrostatic potential, Laplace's equation, point charges, continuous charge distributions and dipoles, capacitors, dielectrics and field energy, Nernst-Planck equation and membrane potentials, Theory of electrolytes: Solubility and electrophoresis of proteins, quasi-static flow of charge, distribution of potential in volume conductors, Application of electrocardiography, Magnetic fields, Amperes laws; the law of Biot and Savart, Magnetic properties of matter, Faraday's law of induction, Electrical circuits, oscillators, feedback, with application to medical instrumentation e.g pacemakers.

300 Level

GST 312: Peace and Conflict Resolution

(2 Units C: LH 30)

Learning Outcomes

At the end of the course, students should be able to:

1. analyse the concepts of peace, conflict and security;
2. list major forms, types and root causes of conflict and violence;
3. differentiate between conflict and terrorism;
4. enumerate security and peace building strategies; and
5. describe roles of international organisations, media and traditional institutions in peace building.



Course Contents

Concepts of Peace, Conflict and Security in a multi-ethnic nation. Types and Theories of Conflicts: Ethnic, Religious, Economic, Geo-political Conflicts, Structural Conflict Theory, Realist Theory of Conflict, Frustration-Aggression Conflict Theory. Root causes of Conflict and Violence in Africa: Indigene and settlers Phenomenon, Boundaries/boarder disputes, Political disputes, Ethnic disputes and rivalries. Economic Inequalities, Social disputes, Nationalist Movements and Agitations. Selected Conflict Case Studies – Tiv-Junkun; Zango Kartaf, Chieftaincy and Land disputes and many others. Peace Building, Management of Conflicts and Security: Peace & Human Development. Approaches to Peace & Conflict Management --- (Religious, Government, Community Leaders and many others). Elements of Peace Studies and Conflict Resolution. Conflict dynamics assessment Scales: Constructive & Destructive. Justice and Legal framework: Concepts of Social Justice, The Nigeria Legal System. Insurgency and Terrorism. Peace Mediation and Peace Keeping. Peace & Security Council (International, National and Local levels) Agents of Conflict resolution – Conventions, Treaties Community Policing: Evolution and Imperatives. Alternative Dispute Resolution, ADR. Dialogue b). Arbitration, c). Negotiation d). Collaboration and many others. Roles of International Organisations in Conflict Resolution. (a). The United Nations, UN and its Conflict Resolution Organs. (b). The African Union & Peace Security Council (c). ECOWAS in Peace Keeping. Media and Traditional Institutions in Peace Building. Managing Post-Conflict Situations/Crisis: Refugees. Internally Displaced Persons, IDPs. The role of NGOs in Post-Conflict Situations/Crisis

ENT 312: Venture Creation

(2 Units C: LH 15; PH 45)

Learning Outcomes

At the end of this course, students, through case study and practical approaches, should be able to:

1. describe the key steps in venture creation;
2. spot opportunities in problems and in high potential sectors regardless of geographical location;
3. state how original products, ideas, and concepts are developed;
4. develop business concept for further incubation or pitching for funding;
5. identify key sources of entrepreneurial finance;
6. implement the requirements for establishing and managing micro and small enterprises;
7. conduct entrepreneurial marketing and e-commerce;
8. apply a wide variety of emerging technological solutions to entrepreneurship; and
9. appreciate why ventures fail due to lack of planning and poor implementation.

Course Contents

Opportunity Identification (Sources of business opportunities in Nigeria, Environmental scanning, Demand and supply gap/unmet needs/market gaps/Market Research, Unutilised resources, Social and climate conditions and Technology adoption gap). New business development (business planning, market research). Entrepreneurial Finance (Venture capital, Equity finance, Micro finance, Personal savings, Small business investment organisations and Business plan competition). Entrepreneurial marketing and e-commerce (Principles of marketing, Customer Acquisition & Retention, B2B, C2C and B2C models of e-commerce, First Mover Advantage, E-commerce business models and Successful E-Commerce Companies,). Small Business Management/Family Business: Leadership & Management, Basic book keeping, Nature of family business and Family Business Growth Model. Negotiation and Business communication (Strategy



and tactics of negotiation/bargaining, Traditional and modern business communication methods). Opportunity Discovery Demonstrations (Business idea generation presentations, Business idea Contest, Brainstorming sessions, Idea pitching). Technological Solutions (The Concept of Market/Customer Solution, Customer Solution and Emerging Technologies, Business Applications of New Technologies - *Artificial Intelligence (AI)*, *Virtual/Mixed Reality (VR)*, *Internet of Things (IoTs)*, *Blockchain*, *Cloud Computing*, *Renewable Energy* and many others. Digital Business and E-Commerce Strategies).

PST 311: Introduction to Physiotherapy Profession

(2 Units C: LH 15; PH 45)

Learning Outcomes

At the end of this course, the students should be able to:

1. appreciate the basic knowledge of Physiotherapy profession, responsibilities of a physiotherapist to the patients and clients;
2. familiar with process and procedure of patient handling and management;
3. describe the basic procedure of documentation in patient handling and assessment of vital signs, reflexes and physiotherapy related clinical parameters;
4. explain the procedures of muscles, Pain, joint mobility assessment; and
5. explain the basic procedure of walking aid assessment for patients.

Course Contents

History and evolution of physiotherapy as a profession and a clinical practice/approach to health care management. Definition of Physiotherapy. Clinical Responsibilities (Personal Responsibility, Professional Responsibility, Role of patient to the therapist; Preparation of the environment; Preparation of the patient). Assessment: - Identification, History, Examination (Local Examination Observation, Palpation, Movement). Values of Record Keeping, Vital Signs (Pulse, Respiratory Rate, Body Temperature, Blood Pressure). Skin Sensation Tests (Perception of pain and touch, Perception of hot and cold), White Reaction, Triple response, Tendon reflexes, Babinski Reflex, Assessment of muscle bulk, Measurement of muscle strength, Measurement of pain, Measurement of joint range, Walking aids.

PST 312: Exercise Physiology

(2 Units C: LH 15; PH 45)

Learning Outcomes

At the end of this course, the students should be able to:

1. give a good overview of exercise physiology and the relevancy to therapeutic exercise;
2. discuss the structure and functions of the skeletal muscle;
3. describe common pathway of metabolism;
4. discuss physiological adjustment of body systems to exercise;
5. explain body responses to aerobic exercise and body adaptation to exercise regimen; and
6. have a good knowledge of effect of exercise on body organs.



Course Contents

Definitions of physiology of exercise. Importance of Exercise physiology in human health and functioning. Structure of skeletal muscle. Functions of skeletal muscle. Energy systems and body fuels. Final common pathway of metabolism. Physiological adjustment of body systems to exercise under different conditions. Body response to acute/single bout exercise, exercise and adaptations to chronic exercises. Effects of exercise on body composition.

PST 313: Electrotherapy I- Direct & Low Frequency Currents II (2 Units C: LH 30)

Learning Outcomes

At the end of this course, students should be able to:

1. acquired scientific knowledge of Faradic Current I Definition, Parameters; Motor points, Methods, Faradic Current II;
2. discuss the therapeutic uses of faradic current, dangers, precautions, indications and contraindications;
3. explain the concepts of Interrupted Direct Current, therapeutic uses and physiologic effects;
4. acquire the therapeutic skills for the Electrotherapy Diagnosis - Strength duration curve test, Electromyography, chronaxie, rheobase, pulse ratio, Values of each method;
5. acquire the knowledge and concepts of Iontophoresis - uses, indication, Medium Frequency Currents/Near current form-effects of interferential Currents;
6. discuss the concepts of Electrical Nerve stimulation for analgesia -Transcutaneous Electrical Nerve stimulation, Interferential Therapy; and
7. discuss the concepts of Pain Modulation Theory.

Course Contents

Physics of heat and biophysical principles of heating and superficial heating, Faradic Current I Definition, Parameters. Motor points, Methods, Faradic Current II, Physiological effects, therapeutic uses, indications, dangers and precautions, Interrupted Direct Current - Definition, Parameters, Methods, Physiological effects, Therapeutic uses, indication, dangers, precautions, Other forms of low frequency currents - diadynamics and many others. Electrotherapy Diagnosis - Strength duration curve test, Electromyography, chronaxie, rheobase, pulse ratio, Values of each method. Direct Current - Galvanism; Iontophoresis - uses, indication, Medium Frequency Currents/Near current form-effects of interferential Currents. Electrical Nerve stimulation for analgesia-Transcutaneous Electrical Nerve stimulation, Interferential Therapy. Pain Modulation Theory.

PST 314: Practical Electrotherapy I

(1 Unit C: PH 45)

This is practical demonstration of the course PST 314

Learning Outcomes

At the end of the course, students should be able to:

1. make all necessary preparations (tray, patients, machine) prior to application of electrotherapy modalities;
2. demonstrate skills in communicating relevant information to simulated patients prior to applying electrotherapy applying electrotherapy modalities;
3. demonstrate skills in applying each electrotherapy modality; and
4. demonstrate skills in documenting treatment given to simulated patients.



PST 315: Kinesiology and Pathokinesiology

(2 Units C: LH 30)

Learning Outcomes

At the end of this course, the students should be able to:

1. display a good knowledge of Bio-mechanical principles as related to human motion;
2. discuss the relationship of anatomical structures to physical functions and differentiate between gross and fine motor skills;
3. discuss types of muscle contractions, group action of muscles agonists, antagonists, fixators, synergists and many others;
4. describe the Muscular analysis of common activities of daily living;
5. analyse and compare normal and abnormal human motions including gait;
6. appreciate and acquire the skills for the types of instruments for and methods of measuring range of joint motion;
7. state and describe the types of instruments and method for measuring range of joint motion and
8. define Goniometry Principles, classification and clinical applications of motor skills and Clinical applications of motor skill.

Course Contents

Bio-mechanical principles as related to human motion. Relationship of anatomical structures to physical functions. Range of muscle work (inner, middle and outer). Types of muscle contraction. Group action of muscles agonists, antagonists, fixators, synergists and many others. Principles of motion and force as applied to the body at rest and in motion. Muscular analysis of common activities of daily living (such as standing up from sitting, walking, brushing, hair combing, feeding and many others). Analysis of normal human gait. Methods of kinetic and kinematic gait analysis. Range of motion and causes of limitation. Types of instruments for and methods of measuring range of joint motion. Goniometry. Principles of motion and force as they apply to the body in action and in equilibrium. Range of motion and causes of limitation. Goniometry. Principles, classification and clinical applications of motor skills. Clinical applications of motor skill. Analysis of normal and abnormal human movements such as normal and abnormal gait & Posture. Prescription of corrective therapy for abnormal motions and postures. Types of walking aids and application.

PST 316: Massage

(2 Units C: LH 15; PH 45)

Learning Outcomes

At the end of this course, students should be able to:

1. discuss the historical background and development of massage;
2. discuss Preparations for Massage Manipulation - Basic Requirements;
3. describe Factors determining dosage of massage, Classifications of Massage Manipulations and Massage Techniques;
4. acquire skills on the uses of massage on different disease conditions;
5. state the uses of massage in sports injuries;
6. define different bandages techniques and its applications; and
7. discuss Inductions and contra-indications for massage manipulations.



Course Contents

Historical development, and definitions of Massage Manipulations. Preparations for Massage Manipulation - Basic Requirements. Factors determining dosage of massage. Classifications of Massage Manipulations. Massage Techniques; Practical Demonstration on Upper Limb, Lower Limb, Neck, Back and Face. Frictional Massage. Vibration and Shaking Massage Techniques. Hands on for different Conditions - Ulcer, Scars, Oedema, Bell's palsy, Radical Mastectomy, Soft Tissues Injuries, Cardiac Massage. Massage for specific purposes - Sport massage, Massage for the Elderly, Baby and Infant Massage. Massage for Patients with Respiratory Conditions, Bandaging - Varieties of bandages, Bandaging techniques, Bandaging to effect support, Bandaging to control oedema. Mechanical, Physiological, Psychological and therapeutic effects of massage. Inductions and contra-indications for massage manipulations.

PST 317: Exercise Therapy I Introduction to Body Movements (2 Units C: LH 30)

Learning Outcomes

At the end of this course, the students should be able to:

1. discuss the Mechanics principles of Force, Tension, Mechanics of position;
2. explain Mechanics of movement: Axes and planes, scalar and vector quantity; Simple machines, Pendulums, Elasticity and General introduction to movement;
3. describe body levers and the force applied to it, types of movement and posture, types of muscle contraction, types of muscle work, strength of muscle contraction, group action of muscles, pattern of movement, and the nervous control of movement;
4. discuss the basic concepts of therapeutic exercise, techniques and clinical applications;
5. describe different breathing exercises techniques indications and contraindications; and
6. state approaches to patient problems and assessment of patient's conditions for therapeutic exercise.

Course Contents

Mechanics principles: Force, Tension, Mechanics of position (Gravity, base of support, equilibrium, fixation and stabilisation). Mechanics of movement: Axes and planes, scalar and vector quantity. Simple machines (Levers and Pulley). Pendulums, Elasticity. General introduction to movement: Body levers and the force applied to it, types of movement and posture, types of muscle contraction, types of muscle work, range of muscle work, strength of muscle contraction, group action of muscles, pattern of movement, timing of movement, rhythm of movement and the nervous control of movement. Introduction to exercise therapy: definition, aims of treatment by exercise therapy, the techniques of exercise therapy, starting positions. Introduction to breathing exercise (Chest physiotherapy): Localized breathing, general breathing, measurement of chest girth (chest expansion), vital capacity. Approach to patient problems and assessment of patient's conditions.



PST 320: Exercise Therapy II: Therapeutic Exercise Prescriptions (2 Units C: LH 15; PH 45)

Learning Outcomes

At the end of this course, the students are expected to:

1. discuss the theory and principles of application of the different techniques of therapeutic exercises;
2. describe concepts and applications of specific exercise Regimens and mechanical variable in exercise prescription;
3. explain Maximum Heart Rate (HRmax), Rates of expired exertion, Maximum Oxygen Consumption (V02max), Frequency and duration of relevant therapeutic exercise;
4. discuss application and prescriptions of Therapeutic Exercises for the treatment of different conditions in all physiotherapy specialties;
5. apply knowledge, skills and usage of different exercise modalities and equipment;
6. discuss technique of lifting an object/ patient, correct sitting posture, correct standing posture, correct walking posture and causes of faulty posture;
7. state the role of motor unit in muscle strengthening; and
8. appreciate exercise programme development & design, principles of therapeutic exercise prescription, individual and group/class exercise therapy.

Course Contents

The theory and principles of application of the different classes of therapeutic exercises: - Passive movements and Active exercises. Specific exercise Regimens (Isotonic exercise Regimen, Isokinetic exercises Regimen, Chest Physiotherapy). Some mechanical variable in exercise prescription (progression of exercises):- Intensity, Maximum Heart Rate (HRmax), Rates of expired exertion, Maximum Oxygen Consumption (V02max), Frequency of exercise, Duration of exercise. Therapeutic Exercises for the treatment of specific neuro-musculoskeletal conditions. Treatment of abdominal surgery (Pre and post op physiotherapy). Routine exercise when plaster of Paris (Cast) is in-situ, Common fractures:- Colle's fractures, Pott's fractures, fracture shaft of femur and many others. General postural correction - Definition of posture, Regulation of posture, Technique of lifting an object/ patient, Correct sitting posture, Correct standing posture, Correct walking posture, Causes of faulty posture, Principle of treatment of faulty postures. Principles of muscle strengthening in health and disease as applied to major muscles of the body. Role of motor unit in muscle strengthening. Use of medicine ball, wobble boards, and Tilt tables. Relaxation techniques. Exercise programme development & design, principles of therapeutic exercise prescription. Individual and group/class exercise therapy.

PST 321: Practical Exercise Therapy, Kinesiology & Cryotherapy (1 Unit C: PH 45)

This is practical demonstration of the Courses; PST 316, PST 317, PST 318, PST 320 & PST 325

Learning Outcomes

At the end of the course, students should be able to:

1. demonstrate skills in selecting appropriate exercises for different purposes and specific conditions;
2. demonstrate skills in instructing simulated patients in exercises;
3. provide progression in an exercise programme;
4. measure range of motion of peripheral and spinal joints;



5. analyse motor skills involved in Activities of Daily Living (ADLs);
6. identify and correct abnormal gait and other motor skills in different conditions;
7. instruct and train simulated patients in various crutch gaits;
8. demonstrate skills in applying massage manipulations for different purposes and to different parts of the body.;
9. perform mobilisation techniques to major peripheral joints; and
10. describe the techniques of spinal manipulations.

PST 322: Electrotherapy II- Thermal & Radiation Agents in Physiotherapy (2 Units C: LH 30)

Learning Outcomes

At the end of this course, the students should be able to:

1. discuss Physics of heat and biophysical principles of heating and superficial heating agents, modes of heat transfer-conduction, convection and radiation;
2. explain thermotherapy techniques, physiological effects, therapeutic uses, techniques;
3. explain the concepts of paraffin wax-physiological effects, therapeutic uses, techniques and thermotherapy III;
4. define concepts of different Radiations and therapeutic applications, Physiological effects, techniques, indications, contraindications and precaution;
5. explain the concepts of ultrasound therapy, therapeutic applications, Physiological effects, techniques, indications, contraindications and precaution; and
6. explain the concepts of LASER therapy, therapeutic applications, Physiological effects, techniques, indications, contraindications and precaution.

Course Contents

Physics of heat and biophysical principles of heating and superficial heating agents. Modes of heat transfer-Conduction, convection and radiation. Thermotherapy I-Contact Techniques Water, Hot packs, Physiological effects, therapeutic uses, techniques. Thermotherapy. Contact Techniques - Paraffin Wax-Physiological effects, therapeutic uses, techniques. Thermotherapy III- Radiations - Infra Red Radiation, Therapy- Physiological effects, techniques, indications, contraindications, precaution. Ultraviolet radiation - productions, physiological effects, therapeutic uses, techniques contra-indications, indications, precaution. Ultrasound Therapy - Production, characteristics and physiological effects, Therapeutic uses, techniques, indications, contraindications, precautions. Laser - background on LASER, principles of LASER, basic components, classification, biophysical effects, indications/contraindications, documentation

PST 323: Electrotherapy III- High Frequency Currents (2 Units C: LH 30)

Learning Outcomes

At the end of this course, students should be able to:

1. display good background knowledge about the Structure and functions of the skin; Effects and consequences of the application of local heat on tissues;
2. discuss the general guideline to the uses of most electrotherapeutic modalities;
3. describe different methods of heat transfer; High Frequency Currents (HFC), Properties and applications of HFC;
4. acquire scientific and clinical knowledge on SWD, MWD productions, physiological effects and applications; and



5. summarise indications, contraindication, potential danger, safety precautions of HFC.

Course Contents

Structure and functions of the skin. Effects and consequences of the application of local heat on tissues. General guideline to the uses of most electrotherapeutic modalities. Standards for each treatment procedure. Different methods of heat transfer. Danger of sudden increase in heat stress. High Frequency Currents (HFC) - Historical back ground, What is HFC, Properties of HFC, Production of HFC. Short Wave Diathermy (SWD) - Principles of production, Methods of application, Physiological effects, Therapeutic uses, Indications, Contra-indication, Potential Danger, Safety precautions; Micro-Wave Diathermy (MWD) - Principles of production, Methods of application, Physiological effects, Therapeutic uses, Indications, Contraindication, Potential Danger, Safety precautions.

PST 324: Practical Electrotherapy II

(1 Unit C: PH 45)

This is practical demonstration of the Courses; PST 322 and PST 323

Learning Outcomes

At the end of the course, students should be able to:

1. demonstrate skills in selecting and applying appropriate stimulating currents for different purposes and conditions; and
2. demonstrate skills in electro-diagnosis.

PST 325: Cryotherapy and Hydrotherapy

(2 Units C: LH 30)

Learning Outcomes

At the end of this course, students should be able to:

1. acquire the necessary knowledge about the concept of cryotherapy and the historical background;
2. describe physical principles underlying energy transfer with cooling agents and biophysical effects of cold therapy;
3. summarise general principles of selecting a cooling agent, general preparations of cold therapy, ice massage, ice towels, cold baths, vapocoolant sprays and compression units;
4. apply skills and knowledge acquire about clinical conditions for which cold can be of benefit; indications and contra-indications; precautions to be taken to ensure the safety of the patient during cold therapy;
5. discuss the historical background of hydrotherapy & spa; physical properties of water as applied to therapeutic pool; indication and contraindication for hydrotherapy and physiologic effect of hydrotherapy;
6. explain the concept of different types of hydrotherapy techniques; therapeutic pools & common equipment; and
7. appreciate health and safety in hydrotherapy and purification of therapeutic pool.



Course Contents

Definition and description of development of cryotherapy. Physical principles underlying energy transfer with cooling agents. Biophysical effects of cold therapy (Cryotherapy). General principles of selecting a cooling agent. General preparations of cold therapy - Cold packs, Ice massage, Ice towels, Cold baths, Vapocoolant sprays, Controlled cold - Compression units. Clinical conditions for which cold can be of benefit. Indications and Contra-indications. Precautions to be taken to ensure the safety of the patient during cold therapy (Cryotherapy). Dangers and safety measures in CT. Practical demonstrations of method of cold therapy (Cryotherapy). Therapeutic effects of cold therapy Historical Background of Hydrotherapy & Spa. Physical Properties of Water as Applied to Therapeutic Pool. Indication and Contraindication for Hydrotherapy. Physiologic Effect of Hydrotherapy. Hydro-gymnasium/Techniques of Therapeutic Exercise in Water/Aquatic Therapy. Types of Hydrotherapy. Therapeutic Pools & Common Equipment. Health and Safety in Hydrotherapy. Purification of Pool.

PST 326: Orthotics and Prosthetics

(2 Units C: LH 30)

Learning Outcomes

At the end of this course, students should be able to:

1. identify different assistive devices, techniques, methods of fabrication and applications of orthotics and prosthesis devices;
2. describe different types of orthotics and prosthesis devices for correcting or assisting specific disorders and disease conditions;
3. discuss the biomechanical principles of prescribing prosthesis and use orthotics devices;
4. explain Physiotherapy roles in rehabilitation of amputee;
5. summarise patients education on care, maintenance and uses of prosthesis and orthotics;
6. describe complications and contraindications in the use of different assistive/corrective devices; and
7. relate the Care, uses and prescription of wheelchair and other assistive for activity of daily living, such as crutches, walking frames and sticks.

Course Contents

Appraisal of the different assistive devices, techniques, methods of fabrication and applications of these devices. Different types of orthotics and prosthesis devices for correcting or assisting specific disorders and disease conditions. Biomechanical principles of prescribing prosthesis and use orthosis devices. Physiotherapy in rehabilitation of amputee. Patients' education on care, maintenance and uses of prosthesis and orthosis. Complications and contraindications in the use of different assistive/corrective devices. Care, uses and prescription of wheelchair and other assistive for activity of daily living such as crutches, walking frames and sticks.



400 Level

PST 411: Physiotherapy in Women's Health

(2 Units C: LH 30)

Learning Outcomes

At the end of this course, the students are expected to:

1. demonstrate required skills in prescribing appropriate exercise programme for women before and after child birth;
2. discuss common conditions in women's health, particularly with complications of labour and gynaecological problems requiring physiotherapy;
3. discuss the general principles that guides decision making in women's health conditions;
4. demonstrate beginning level of care skills in managing patients with women's health conditions;
5. take precautionary measures in instructing women in exercise during pregnancy and after child birth;
6. use clinical judgment and reflection to identify, monitor, and enhance clinical reasoning to minimise errors and enhance patient/client outcomes in women's health conditions; and
7. apply relevant examinations and experiential information to guide management and prognosis in women's health conditions.

Course Contents

Review of relevant anatomy and physiology of pregnancy: Menstruation, pregnancy and foetal development, Complications of pregnancy: ectopic, pre-eclamptic toxemia, eclampsia, ante partum haemorrhage, placenta praevia, diabetes mellitus. Physical and physiological changes of labour Complications of labour: failure to progress, maternal and foetal distress, mal-presentation, cephalopelvic disproportion. Puerperium and complications including postpartum haemorrhage, fistulas; common antenatal conditions and management including urinary retention, urinary incontinence, deep vein thrombosis, pulmonary embolism, pregnancy-related pathologies including diastasis recti abdominis, stress incontinence, low back pain and pelvic pain, sacroiliac joint dysfunction and ligamentous laxity, varicose vein, preeclampsia, Caesarean child birth. Including pelvic inflammatory disease, cystocele, urethrocele, enterocele, uterine prolapse, dysmenorrhoea, female athlete triad. Physiotherapy interventions in pregnancy related pathologies.

PST 412: Musculoskeletal Injuries and Rehabilitation

(2 Units C: LH 30)

Learning Outcomes

At the end of this course, the students are expected to:

1. discuss common conditions in musculoskeletal injuries in rehabilitation;
2. demonstrate the skills in history taking; carry out physical examination and other relevant assessment procedures on patients with orthopaedic conditions;
3. discuss the general principles that guides decision making in managing musculoskeletal conditions;
4. demonstrate skills in managing and evaluating patients with orthopaedic conditions commonly seen in physiotherapy;
5. demonstrate skills in communicating treatment goals and plans with patients with orthopaedic conditions; and



6. use clinical judgment and reflection to identify, monitor, and enhance clinical reasoning to minimise errors and enhance patient/client outcomes in musculoskeletal conditions.

Course Contents

Epidemiology, pathology and clinical features of skeletal disorders. Bone infection. Disorders of osteoid formation and maintenance. Disorders of bone mineralization including osteomalacia, Paget disease. Infection of skeletal muscles. Muscular dystrophy congenital: abnormalities of the foot and hand. Spinal disorders – neck pain, back pain, sacro-iliac joint pain, cervical and lumbar spondylosis (intervertebral disc lesions), spinal stenosis, spondylolisthesis, ankylosing spondylitis. Infectious conditions musculoskeletal deformities - scoliosis, kyphosis, and kyphoscoliosis. Myofascial pain syndrome. Fibromyalgia. Connective tissues disorders Joint replacements (hip and knee), acute care (including precautions and safety) following surgeries. Management of chronic and acute soft tissues injuries (muscular, tendinous and ligamentous injuries, tendonitis and many others). Principles of physiotherapy in fracture management, disorders of skeletal muscle and adjoining soft tissue.

PST 413:Physiotherapy Clinical Rotations in Orthopaedic and Traumatology (2 Units C: PH 90)

Learning Outcomes

At the end of this course, the students are expected to:

1. demonstrate skills in taking history; carry out physical examination and other relevant assessment procedures on patients with orthopaedic conditions and trauma;
2. demonstrate skills in clinical reasoning and in making clinical judgments in different orthopaedic and traumatic conditions.;
3. demonstrate skills in communicating treatment goals and plans with patients with orthopaedic conditions and trauma;
4. demonstrate skills in managing and evaluating patients with orthopaedic conditions commonly seen in physiotherapy; and
5. apply knowledge, theory, and professional judgment while managing patients with orthopaedic conditions.

Course Contents

Students will be exposed to history taking, physical examination and specific assessment procedures and clinical judgments, treatment and evaluation of patients in orthopaedic condition and trauma. fractures, dislocations, osteoarthritis, rheumatoid arthritis, back pain, neck pain, spinal stenosis, soft tissue injuries and many others. Students will also be taught the appropriate ways of communicating treatment goals and plans to patients with orthopaedic conditions and following trauma and in chronic and acute soft tissue injuries (muscular, tendinous and ligamentous injuries, tendonitis, tenosynovitis, fasciitis and many others). injuries resulting from fracture of the spine, general principles of physiotherapy in management of fracture and dislocation and in urns, skin protection and repair techniques.



PST 414: Health Management and Outcome Assessments**(2 Units C: LH 30)****Learning Outcomes**

At the end of this course, the students are expected to:

1. discuss the general principles in selecting outcome measures that guides decision making in physiotherapy;
2. demonstrate knowledge and understanding of the general principles of measurement and outcome measures and their psychometric properties;
3. demonstrate the ability to select appropriate outcome measures for specific conditions and patients; and
4. demonstrate the skills to monitor the status of patients using the relevant outcome measures and tools.

Course Contents

Definition of health measurement. population and individual health statistics. physiotherapy measurement and clinical decision making. outcomes assessment and selection and integration of outcome measures into clinical practice. development of clinical measuring instruments. measurement of specific variables including vital signs, pain, disability, functional performance. anthropometric variables, physical fitness measurement (stress test), lung function tests, motor function tests. Psychometric properties including validity, reliability, utility, sensitivity and specificity, and clinically important change. measurement of specific variables including disability. Health-related quality of life, satisfaction with life, mental status. Activities of daily living functions, stress and many others.

PST 415: Physiotherapy in Pain Management**(2 Units C: LH 30)****Learning Outcomes**

At the end of this course, the students are expected to:

1. describe the anatomy and physiology of pain and pain transmission;
2. explain what pain modulation is and enumerate physiotherapy modalities for pain modulation;
3. discuss the mechanism of pain and the general principles that guides pain management in physiotherapy;
4. use clinical judgment and reflection to identify and select pain modulation techniques that could benefit patient and to minimize errors and enhance patient/client pain outcomes;
5. demonstrate developing level of care skills in managing patients with intractable pain; and
6. use clinical judgment and reflection to identify, monitor, and enhance clinical reasoning to minimise errors and enhance patient/client outcomes in managing pain.

Course Contents

Pain as a fifth vital signs. ramifications of pain including physical, pathological, emotional, social, psychological, financial, spiritual and many others. Philosophy of pain, current understanding of mechanisms of pain. mechanism of pain sensation and theories on pain modulation including gate control theory, endogenous opiates theory. Pain assessment and tools including unidirectional and multi-dimensional scales. Principle of pain management in physiotherapy. Types of treatment- pharmacologic and non-pharmacologic. The role of the physiotherapist in the holistic assessment and management of pain.



PST 416: Physiotherapy in Infectious Diseases Control and Prevention (1 Unit C: LH 30)

Learning Outcomes

At the end of this course, the students should be able to:

1. discuss the epidemiological concepts in infectious disease control and prevention;
2. describe infection prevention and control strategies to protect therapists, promote quality and safe patient care;
3. discuss infection control standard precautions and requirements for an infection control plan in a healthcare setting;
4. relate the concepts of a clean, disinfected, and sterilize environment in a healthcare setting;
5. explain the procedures of hand washing and disinfections in Physiotherapy clinical practice; and
6. demonstrate the skills required to participate in the development and implementation of operational and strategic initiatives in infection prevention and control in healthcare settings.

Course Contents

Applied Microbiology. Epidemiological concepts in infectious disease prevention. Risk assessment in (acute/long-term) care and community settings. Using current literature to formulate or adapt. Infection prevention and control strategies to protect therapists, promote quality and safe patient care. Infection control standard precautions and requirements for an infection control plan in a healthcare setting. The concepts of a clean, disinfect, and sterilize environment in a healthcare setting. Procedures of hand washing and disinfections in Physiotherapy clinical practice. Infection prevention and control in Physiotherapy: Implications for first contact practice and direct patient management.

PST 421: Neurological Physiotherapy-I

(2 Units: C: LH 30)

Learning Outcomes

At the end of this course, the students are expected to:

1. discuss the general principles that guides decision making in physiotherapy care in neurological conditions;
2. apply knowledge and understanding of the general principles and approaches for maximised outcome in neurological conditions;
3. use clinical judgment and reflection to identify, monitor, and enhance clinical reasoning to minimise errors and enhance patient/client outcomes in neurological condition;
4. describe the philosophical basis of each of the traditional approaches to neuro-rehabilitation;
5. explain the current motor control theory and compare it to traditional theories of motor control; and
6. describe the aetiology, pathological basis, clinical features and outline treatment plans for the neurological conditions listed in the course contents.



Course Contents

Review of the physiology and anatomy of the nervous system. Infectious diseases of the nervous system, trauma, degenerative disorders, epilepsy, disorders of equilibrium, cranial and peripheral nerve disorders. Specific lesions within the skull – hemiplegia, Parkinson's disease, head injuries and space-occupying brain lesions. Lesions within the spinal column – paraplegia, quadriplegia, tables dorsalis, disseminated sclerosis, polyneuritis, and peripheral neuropathy. Syringomyelia, poliomyelitis, myasthenia gravis, Gullian Barre syndrome. Other conditions such as multiple sclerosis, amyotrophic lateral sclerosis. Principles of neurological assessment (sensory & motor dysfunctions); medical and physiotherapy management of conditions.

PST 422: Physiotherapy Clinical Rotation in Neurology-I

(2 Units C: PH 90)

Learning Outcomes

At the end of this course, the students are expected to:

1. take history; carry out physical examination and other relevant assessment procedures on patients with neurological conditions;
2. demonstrate skills in clinical reasoning and in making clinical judgments in different neurological conditions;
3. demonstrate skills in communicating treatment goals and plans with patients with orthopaedic conditions; and
4. demonstrate skills in managing and evaluating patients with neurological conditions commonly seen in physiotherapy.

Course Contents

Students will be exposed to patient management elements including examination, evaluation, physical diagnosis, prognosis and intervention and plan of care as well as care coordination. history taking, physical examination and specific assessment procedures and clinical judgments, treatment and evaluation of patients with neurological conditions. Importance and rights of patients and confidentiality; Specific conditions to be covered may include but is not limited to stroke, Parkinson's disease, diabetes mellitus, Guillain-Barre syndrome and many others. Students will also be exposed to the appropriate ways of communicating treatment goals and plans of care to patients with neurological disorders as well as goal setting. Student will be taught approaches and principle of treatment including remediation or facilitation approaches that includes general concepts and proprioceptive neuromuscular facilitation, neurodevelopmental techniques or Bobath approach, motor control and motor learning approaches, and compensation approach

PST 423: Special Topics in Health Seminar

(1 Unit C: PH 45)

Learning Outcomes

At the end of this course, the students are expected to:

1. discuss topics and issues in health care;
2. gain insights into the various areas in which physiotherapists can contribute for the health and well-being of the population; and
3. explain the advocacy and other roles of physiotherapists in special populations and on population health.

Course Contents



Seminar presentation on health care issues including but not limited to International health definitions and classifications: ICF (formally ICDH), Determinants of health and health promotion, The Nigerian health environment and policies. Individual and population health statistics, Health care for selected populations, women, children and elderly. Ethical issues in general clinical and physiotherapy practices. Public and private financing of health services and the National Health Insurance Scheme. Cancer-classification of common cancers in Nigeria. HIV/AIDS, Euthanasia.

PST 424: Sports and Recreational Physiotherapy

(2 Units C: LH 30)

Learning Outcomes

At the end of this course, the students are expected to:

1. discuss common conditions in sports and recreation;
2. demonstrate understanding of the general principle of care in sports and recreation;
3. apply the general principles that guides decision making in sports conditions;
4. use clinical judgment and reflection to identify, monitor, and enhance clinical reasoning to minimise errors and enhance patient/client outcomes in managing conditions in sports and recreation; and
5. apply relevant examinations and experiential information to guide diagnoses, prognosis and intervention in conditions in sport and recreation.

Course Contents

Common injuries involving athletes and individuals in recreational sporting activities including soccer, basketball, weight lifting and other sports. Knee injuries including anterior cruciate ligament injury, posterior cruciate ligament, and meniscal tear injuries and collateral ligamentous tear. patella tendon rupture. conditions in weight lifters including osteolysis of acromio-clavicular joint and other conditions including golfer's elbow. ankle injuries including Achilles tendon rupture. shoulder injuries including rotator-cuff tear. Gender issues in sports and injury in female athletes. Surgical intervention in sports injuries. ergogenic aides. physiotherapist in a sport setting. physical management of sports injuries to facilitate quick recovery testing and training and criteria for return to play following surgical intervention. performance measures, and sports specific rehabilitation. sports injury prevention and health education. fitness assessment of athletes, motor skill, and anthropometric evaluation.

PST 425: Psychiatry and Mental Health

(2 Units C: LH 15; PH 45)

Learning Outcomes

At the end of this course, the students are should be able to:

1. discuss the general principles that guides decision making in physiotherapy care decisions in psychiatric and mental health conditions;
2. gain insights into considerations in physiotherapy management of patients with psychological and psychiatric conditions;
3. demonstrate skills in clinical reasoning and in making clinical judgments in different psychological and psychiatric conditions;
4. demonstrate skills in communicating treatment goals and plans with patients with psychological and psychiatric conditions; and
5. demonstrate skills in physiotherapy management of patients with psychiatric and psychological conditions.



Course Contents

Psychiatry and psychiatric disorder, prevalence of psychiatric disorder, Pathologies of psychiatric disorders such as anxiety including panic attacks, phobias, obsessive-compulsive behaviours. psychosomatic disorders, including conversion disorder or hysterical paralysis, and hypochondriac; schizophrenia; bipolar disorder; and perseveration. Other conditions such as organic brain syndromes, neurosis, sexual disorder, transference and counter-transference will be covered., Considerations for patients receiving physiotherapy intervention in managing psychosomatic disorders and counselling, Burn out and human service profession; prevention of burnout, Psychological testing tools.

PST 426: Clinical Practice I (Neurophysiotherapy And Musculoskeletal) (1 Unit C: PH 45)

This is externally moderated examinations of students on their clinical skills in neurological physiotherapy and musculoskeletal physiotherapy practice. It shall examine competency in the skills learnt in PST 412, PST 413, PST 421, PST 422

In this clinical examination, a candidate is expected to:

1. exhibit competency in taking history, carry out physical examination and other relevant assessment procedures on patients with musculoskeletal and neurological conditions;
2. demonstrate skills in clinical reasoning and in making clinical judgments in different musculoskeletal and neurological conditions;
3. demonstrate skills in communicating treatment goals and plans with patients with musculoskeletal and neurological conditions; and
4. demonstrate skills in managing and evaluating patients with musculoskeletal and neurological conditions commonly seen in physiotherapy.

500 Level

PST 511: Neurological Physiotherapy II

(2 Units C: LH 30)

Learning Outcomes

At the end of the course, students should be able to:

1. describe the aetiology, pathological basis and clinical features of neurological conditions listed in the course content; and
2. outline treatment plans for the neurological conditions listed in the course content.

Course Contents

Assessment, management and evaluation of lesions within the spinal column (paraplegia, quadriplegia, Tabes dorsalis). neuropathies (myelinopathy, axonopathy) viz multiple sclerosis, Gullian Barre Syndrome, Syringomyelia, neuromuscular junction disorders (Myasthenia gravis), metabolic neuropathy, cranial nerve injuries, Motor neuron disorders. Neurological complications of infectious diseases such as HIV/AIDS. Assistive devices in neurological rehabilitation and community re-integration of neurological ill patients.



PST512: Physiotherapy Clinical Rotation In Neurology

(2 Units C: PH 90)

Learning Outcomes

At the end of the posting, students should be able to:

1. take history; carry out physical examination and other relevant assessment procedures on patients with head and spinal cord injuries and other conditions requiring neurosurgery;
2. demonstrate skills in clinical reasoning and in making clinical judgments in head and spinal cord injuries and other conditions requiring neurosurgery;
3. demonstrate skills in communicating management plan and other information with patients; and
4. demonstrate skills in managing and evaluating patients with head and spinal cord injuries and other conditions requiring neurosurgery.

Course Contents

Students will be exposed to history taking, physical examination and specific assessment procedures and clinical judgments, treatment and evaluation of patients with head injuries, spinal cord injuries, post excision of tumour within the skull and many others. Students will also be exposed to the appropriate ways of communicating treatment goals and plans to patients with head and spinal cord injuries and other conditions requiring neurosurgery.

PST 513: Research Methods

(2 Units C: LH 30)

Learning Outcomes

At the end of the course, students should be able to:

1. identify research problems;
2. describe what literature search and review entail;
3. describe different research designs and sampling methods; and
4. describe the process of investigating a research problem.

Course Contents

Research in physiotherapy – focus on the 21st century research.

Identification of research problems. Literature search and review – peripheral and core literature, electronic search engines, importance of meta-analysis, use of literature to guide research. Research designs and sampling methods. Variables – independent & dependent. Data collection, storage and analysis and presentation. Referencing styles, Manuscript preparation for dissertation and journal publication.

PST 514: Biostatistics

(2 Units C: LH 30)

Learning Outcomes

At the end of the course, students should be able to:

1. discuss the importance of statistics to research;
2. describe scientific methods of collating and summarizing data; and
3. select and apply appropriate statistical tests for testing hypotheses.



Course Contents

Importance and central role of statistics in research. Review – types of variables, scales of measurement, concept of sampling, data collection. Reduction, summarisation and presentation of data. Probability. The Normal distribution. Sampling methods. Tests of hypothesis (significant difference, correlation, regression and many others.). Parametric and non-parametric tests. Factors for considerations in choosing a particular statistics such as Student-t test; Mann-Witney U, ANOVA, MANOVA, Regression Analysis

PST 515: Spinal and Peripheral Joint Manipulation

(2 Units C: LH 30)

Learning Outcomes

At the end of the course, students should be able to:

1. differentiate between mobilisation and manipulation and between physiological and accessory motion;
2. explain the basic concepts of joint motion;
3. enumerate the indications for and contraindications to joint mobilisation;
4. describe the procedure (including concave-convex rule) for and apply joint mobilisation to different parts of the body; and
5. describe the different approaches to spinal manipulation.

Course Contents

Definitions of joint mobilisation. Physiological and accessory motions. Basic concepts of joint motion – joint shapes, sliding & rolling. Indications, goals limitations and contraindication for joint mobilisation. Procedures for applying joint mobilisation, including concave-convex rule. Specific mobilisation techniques as applied to joints in the body. Manual traction for cervical and lumbar spine. Safety considerations before mobilisations such as Vertebra-Basilar Insufficiency (VBI), revision of anatomy of VBI and tests and signs. Approaches to spinal mobilisation/manipulation including Cyriax, Mennel, Kaltenborn, Maitland, Nwuga, McKenzie techniques.

PST 516: Ergonomics and Workplace Physiotherapy

(2 Units C: LH 30)

Learning Outcomes

At the end of the course, students should be able to:

1. define and describe the goal of ergonomics;
2. explain the importance of ergonomics to occupational health physiotherapy practice;
3. measure some structural anthropometric variables in the workstation; and
4. give simple ergonomic advice to minimise work-related musculoskeletal disorders.

Course Contents

Definition and goal of ergonomics. Simple and complex work systems. Description of human-machine systems – human components, machine components of a work-system and the local environment. Modern work-system and standard format for describing human-machine systems. Some basic body mechanics – stability and support, control of muscle function, fatigue and discomfort, the spine and pelvis as related to posture. Musculoskeletal problems in sitting and standing - back pain, neck pain and many others. Anthropometric principles in workspace and equipment design (structural anthropometric variables). Different types of office chairs.



Ergonomic adaptation of machines and general conditions towards achieving maximal efficiency by the worker. Ergonomic advice and occupational health physiotherapy.

PST 521: Physiotherapy in Geriatrics

(2 Units C: LH 30)

Learning Outcomes

At the end of the course, students should be able to:

1. describe physiological changes that are associated with ageing;
2. differentiate between geriatrics and gerontology;
3. describe management approaches in the care of the elderly; and
4. discuss safety issues in the care of the elderly.

Course Contents

Theories of ageing. Physiological and anatomical effects of ageing. Methods of evaluation and management of disorders common in the elderly – Diabetes mellitus, hypertension & hypertensive heart disease, musculoskeletal disorders and debilitating conditions. The ageing world population – challenges for physiotherapists. Challenges of care of elderly/aged in Nigeria - the breaking down of traditional family support. Home care versus institutional care. Multidisciplinary approach in geriatric care.

PST 522: Research Proposal Seminar

(2 Units C: LH 30)

This is sequel to the knowledge expectedly acquired by students in research methods and biostatistics. It gives the student the opportunity to present the intended research plan, as may be guided by the assigned research supervisor, at a departmental seminar for critical appraisal by the lecturers and students in the Department.

Learning Outcomes

Students should demonstrate ability to:

1. identify a research problem;
2. review literature relevant to the research problem;
3. identify the objectives and significance of the research;
4. describe the design, sampling method and methods of investigating an identified research problem; and
5. do a write-up and make slides for presentation of the seminar topic at a Departmental Seminar.

PST 523: Community-Based Physiotherapy & Primary Care Physiotherapy (2 Units C: LH 30)

Learning Outcomes

At the end of the course, students should be able to:

1. discuss the differences between community based and hospital based physiotherapy services;
2. explain the philosophy of primary health care;
3. discuss the states of community based and primary; and
4. discuss health Care physiotherapy services in Nigeria.



Course Contents

Principles of health education – contact, screening, health talks. Community clinic – establishing physiotherapy clinics in villages and towns (mosques, churches, markets, schools and many others), Itinerant and domiciliary services. Organisation of domiciliary physiotherapy services in developed countries. Philosophy of Community based Rehabilitation (CBR). Philosophy of Primary Health Care (PHC). Primary Health Care physiotherapy services in Nigeria.

PST 524: Paediatrics Physiotherapy

(2 Units C: LH 30)

Learning Outcomes

At the end of the course, students should be able to:

1. describe the sequence, principles of and factors influencing movement development during first five years of life;
2. describe the pathological basis, aetiology and clinical features of neuromotor and neuromuscular conditions in children;
3. describe the assessment procedures for neuromotor and neuromuscular conditions in children; and
4. describe physiotherapy management of neuromotor and neuromuscular conditions in children.

Course Contents

Motor development during the first five years of life - important considerations in motor development (growth/maturation of the brain after birth, environment), sequence, principles of development. Introduction to motor control theories; reflex development and testing. Cerebral palsy – definition, aetiology, clinical features and classification, assessment, treatment approaches (Neuro developmental Therapy/Bobath's method). Spina Bifida. Mental retardation (Downs Syndrome). Autism. Acute flaccid paralysis – poliomyelitis, sciatic nerve injection palsy, Gullian Barre Syndrome. Brachial plexus injuries (Erb's palsy, Klumpke's paralysis, Duchenne - Klumpke's paralysis). Muscular dystrophies.

Flaccid paralysis in children: - Orthopaedic problems in childhood: - Congenital foot deformities, congenital hip dislocations, osteogenesis imperfecta, torticollis, juvenile. Rheumatoid arthritis, muscular dystrophies. Cardiorespiratory disorders in children such as cystic fibrosis, asthma and rheumatic fever.

PST 525: Physiotherapy Clinical Rotation in Paediatrics

(2 Units C: PH 90)

Learning Outcomes

At the end of the posting, students should be able to:

1. demonstrate skills in history taking and physical examination in paediatric disorders;
2. demonstrate skills in analysing clinical data, setting of goals and identifying treatment outcomes for paediatric conditions;
3. demonstrate skills in communicating management plan with parents/carers; and
4. demonstrate skills in managing paediatric conditions commonly seen in physiotherapy clinics.



Course Contents

Students shall be exposed to history taking, physical examination, measurement of degree of disability, clinical judgments and management of children with cerebral palsy, infantile brachial plexus injuries, spina bifida, acute flaccid paralysis, post immobilisation stiffness, progressive muscular dystrophy, Down's syndrome and many others. Students will be taught appropriate ways of communicating treatment goals, treatment plans, exercise home assignments and advice to parents/caregivers.

PST 526: Clinical Practice II

(1 Unit C: PH 45)

This is an externally moderated examination of students on their clinical skills in neurological physiotherapy with respect to their skills in managing neurosurgical conditions and paediatric physiotherapy conditions. This shall cover clinical skills acquired through PST 511, PST 512, PST 525 and PST 526

In this clinical examination, a candidate is expected to:

1. demonstrate skills in history, carrying out physical examination and other relevant assessment procedures on paediatric patients and other patients with head and spinal cord injuries and other conditions requiring neurosurgery;
2. demonstrate skills in clinical reasoning and in making clinical judgments in managing common paediatric conditions managed by physiotherapy;
3. display skills in clinical reasoning and clinical decision making process in managing head and spinal cord injuries and other conditions requiring neurosurgery;
4. demonstrate skills in communicating management plan and other information with patients;and
5. demonstrate skills in managing and evaluating and reassessment of patients with head and spinal cord injuries and other conditions requiring neurosurgery.

600 Level

PST 601: Research Project

(3 Units C: PH 135)

Learning Outcomes

At the end of the course, students should be able to:

1. under supervision, identify a research problem in physiotherapy;
2. plan a research study;
3. execute data gathering plan, analyse the data gathered and interpret the results obtained; and
4. report findings from the investigation in a dissertation.

Course Contents

Investigating a research problem. Research design and planning execution of the research design. Data collection and storage. Analysis and interpretation of the obtained data. The student reports independent research findings as a dissertation which is submitted to the Department of Physiotherapy in partial fulfilment for the award of Doctor of Physiotherapy degree of the University. The dissertation is examined with the examination externally moderated.



PST 611: Cardio-Respiratory Physiotherapy

(2 Units C: LH 30)

Learning Outcomes

At the end of the course, students should be able to:

1. describe the workings of the respiratory system and lung function.
2. describe the relationship between cardiovascular system and respiratory conditions.
3. explain the underlying principles in the physiotherapy management of respiratory conditions.
4. outline physiotherapy management for patients with respiratory conditions.

Course Contents

Overview of respiratory system, management of patients with respiratory conditions using problem oriented medical system. Subjective assessment-breathlessness, wheeze, cough, sputum. Objective assessment-auscultation, spirometry, chest shapes and movement, breathing pattern, chest radiography, blood gas analysis and implication for management. Principles of management and outcomes measure in respiratory care, physiotherapy techniques: active cycle of breathing, glossopharyngeal breathing, forced expiratory technique, manual hyperventilation, breathing control, airway clearance techniques and adjunct, non-invasive ventilation, basic life support. Management of specific respiratory conditions: COPD, asthma, bronchiectasis, pulmonary oedema, pulmonary tuberculosis, carcinomas, post-surgical conditions such as lobectomy, thoracotomy, pneumonectomy. Pulmonary rehabilitation and reconditioning, health education and promotion, smoking cessation, nutrition and other life style modifications. Paediatric respiratory care.

PST 612: Physiotherapy Clinical Rotation in Cardiopulmonary and Intensive Care (2 Units C: PH 90)

Learning Outcomes

At the end of the course, students should be able to:

1. describe what intensive care physiotherapy entails;
2. differentiate between acute care and intensive care physiotherapy; and
3. discuss precautionary and safety measures in giving intensive care physiotherapy.

Course Contents

Assessment of the critically ill patients in intensive care unit and implication for physiotherapy. neurological system- level of consciousness, cerebral perfusion pressure, intracranial pressure, cardiovascular system- heart rate and rhythm, arterial blood pressure, central venous pressure, pulmonary artery pressure, respiratory system- mode of ventilation, humidification, oxygen therapy, respiratory rate, airway pressure, auscultation, percussion note, chest examination, chest radiograph, renal system, haematological/immunological system, GIT, musculoskeletal system. Mechanical ventilation, intubation, weaning. Condition requiring intensive care: acute respiratory distress syndrome (ARDS) disseminated intravascular coagulation (DIC), inhalation burns, head injury, myasthenia gravis, Guillain-Barre syndrome, tetanus, bulbar poliomyelitis. Physiotherapy technique – mechanical ventilation, care of unconscious patient. Common problems in intensive care unit-de-saturation, cardiopulmonary arrest, self extubation, blocked endotracheal tube. Acute Care: Managements of patients following partial or total hip arthroplasty, total knee arthroplasty, Iliazarov procedure and many others. Importance of early



mobilisation of patients out of bed (special consideration for geriatric patients). Precautionary and safety measures in intensive and acute care.

PST 613: Principles of Management and Administration for Physiotherapy (2 Units C: LH 30)

Learning Outcomes

At the end of the course, students should be able to:

1. describe the characteristics of a modern organisation;
2. describe practical ways of developing effective style of personnel management;
3. explain why a physiotherapy manager needs to have some understanding of financial management;
4. differentiate between policies and procedures; and
5. describe the steps involved in planning facilities for physiotherapy practice.

Course Contents

Elements of managerial process. Analysis of problems involving the planning, developing, organising and administering physiotherapy services. Physiotherapy department, organisation and management, principles of management, human relations, management techniques, personnel management, communications, communication concerns, and strategies for change in the workplace, financial management, legal responsibilities. Nigerian Health Care policy, environment and delivery system, Physiotherapy practice in Nigeria. Principles of management – Organisations, organograms, organisational structure for Physiotherapy practice; Personnel management theory and implications for action, place of unionism in administration, Negotiation for conflict resolution. Operations management; Facilities planning. Ethical principles applied to moral issues in health care regulatory/business ethics. Healthcare marketing. Establishment and operation of a private physiotherapy practice.

PST 614: Physiotherapy in Oncology and Palliative Care (2 Units C: LH 30)

Learning Outcomes

At the end of the course, students should be able to:

1. demonstrate knowledge and understanding of oncology;
2. explain the philosophy of palliative care; and
3. discuss the role of physiotherapy in palliative care.

Course Contents

Terminal illnesses (cancer and staging, full blown AIDS). Common health problems in terminally ill patients - Pain syndromes, Gastrointestinal, respiratory, neurological and urinary symptoms. Psycho-social issues. Specific health problems to specific conditions - Post mastectomy oedema in breast cancer, paraplegia in prostate cancer, swallowing problems in submandibular cancer and many others. Philosophy of palliative care. Ethical issues in palliative care. Pain control in terminally ill patients. Pharmacologic management of cancer pain. Roles of radiotherapy, chemotherapy and surgery in palliation. Role of Physiotherapy in the care of terminally ill patients. Communication skills Death and dying, Spiritual support, Bereavement. Palliative care organisations in Nigeria and elsewhere.



PST 621: Physical Fitness in Health and Disease**(2 Units C: LH 30)****Learning Outcomes**

At the end of the posting, students should be able to:

1. describe physical fitness and components of physical fitness;
2. justify the use of physical fitness to promote health in apparently healthy and in disease states;
3. plan appropriate physical fitness training programme for people with selected health challenges; and
4. highlight the factors modulating engagement in physical fitness in disease states.

Course Contents

Concept of wellness and health promotion. Definition and components of physical fitness. Physical fitness in health and disease. Field and laboratory/clinical methods of assessing physical fitness. Physical fitness training programme for people with obesity, cardiorespiratory functions impairments, amputation, post-stroke hemiplegia/hemiparesis; spinal cord injury patients, children with acute flaccid paralysis, cerebral palsy, mental retardation and autism.

PST 622: Summative Physiotherapy Clinical Posting**(2 Units C: PH 90)****Learning Outcomes**

At the end of the posting, students should be able to:

1. carry out assessment on varieties of patients referred to physiotherapy;
2. make clinical judgments and decisions-making about patients requiring physiotherapy;
3. arrive at appropriate physical diagnosis for patients referred for physiotherapy; and
4. use Evidence-Based Approach to execute appropriate treatments for patients referred to physiotherapy.

Course Contents

Student is expected to rotate round the areas of specialties in physiotherapy clinical practice with particular focus on the following physiotherapy clinics: Musculoskeletal and trauma, paediatrics, women's health,; Neurology (medical and surgical subunits), cardiorespiratory and intensive care physiotherapy, Geriatrics units. Each student will spend two weeks in each of the units at the Physiotherapy Department of the respective teaching hospital. The course shall be examined as part of the Clinical Practice III.

PST 623: Clinical Practice III**(1 Unit C: PH 45)**

This is an externally moderated examination of students on their clinical skills in all areas of physiotherapy clinical practice with respect to managing varieties of clinical conditions commonly referred to physiotherapy. This shall cover clinical skills acquired through PST 611, PST 612, and PST 622.

In this clinical examination, a candidate should be able to:

1. demonstrate skills in history, carrying out physical examination and other relevant assessment procedures on varieties of clinical conditions requiring physiotherapy care.
2. demonstrate skills in clinical reasoning and in making clinical judgments in managing a varieties of clinical conditions managed by physiotherapy.



PST 624: Disability Issues

(1 Unit C: LH 30)

Learning Outcomes

At the end of the posting, students should be able to:

1. describe issues pertaining to people with long-term disabilities and their families within the social and cultural context;
2. describe inter-relationships among disease, deformity, disability, habilitation, and rehabilitation; and
3. situate the roles of physiotherapy in disability issues in clinical and non-clinical settings including advocacy programme.

Course Contents

Definitions and descriptions of disease, deformity, disability, habilitation and rehabilitation. Common causes of long term disabilities – autism, poliomyelitis, cerebral palsy, spinal cord and head injuries, mental retardation and many others. Differences and relationships between the concepts of community rehabilitation and community-based rehabilitation for people with long term disability. Community reintegration post disability. Psychosocial issues – discrimination, deprivation, isolation, mental health, family finance. Care setting. Participation in the society – schooling, access to private and public facilities, transportation, occupation, participation in sports and recreational activities. Policies, advocacies related to disability. Comparison of disability issues such as legislation, enforcement and implementation of relevant promulgations and conventions in Nigeria and other parts of the world.

PST 625: Physiotherapy in Integumentary and Skin Care

(1 Unit C: LH 30)

Learning Outcomes

At the end of this course, the students are expected to:

1. discuss common conditions in integumentary tissues and skin;
2. discuss the general principles that guides decision making in physiotherapy integumentary and skin care;
3. demonstrate beginning level of care skills in managing patients with integumentary and skin conditions commonly seen in physiotherapy; and
4. evaluate data from the examination to make clinical judgments regarding integumentary conditions.

Course Contents

Anatomy and physiology of the skin. integumentary conditions including herpes, dermatitis, and cellulitis. burns and complications on burns injuries. wounds, thermal injuries, dermatologic diseases and disorders. impaired circulation and anthropometric dimensions associated with lymphatic system disorders. interventions for wounds, burns, scars, Peripheral Vascular and Lymphatic Conditions. Specific skin conditions – acne vulgaris, boils, whitlows, carbuncles, psoriasis, alopecia areata totalis, vitiligo, eczema, leprosy, burn and post burns contractures. wounds and scars, wound infections in open wounds, complication of infected wounds (such as tetanus). surgical intervention in skin complications including contractures, skin grafts, varicose ulcers, Buruli ulcers and pressure sores. integument clinical tests, and procedures and prognostic tests. Physiotherapy in dermatological conditions.



Minimum Academic Standards

Equipment

Electrotherapy equipment (with indicated minimum quantity):

| | |
|----------|---|
| 1 Unit | Short wave diathermy machine and appropriate electrodes |
| 6 Units | Infra-Red lamps - (luminous - 3, Non-luminous – 3), |
| 3 Units | Tunnel Baths |
| 1 Unit | Microwave therapy machines and appropriate treatment units |
| 2 Units | Therapeutic ultrasound machines with appropriate treatment heads |
| 2 Units | wax baths (hand and foot) with extra wax packs |
| 2 Units | Electrical stimulators for nerves and muscles with appropriate electrodes |
| 1 Unit | Laser therapy units |
| 2 Units | Interferential therapists units with appropriate electrodes |
| 10 Units | Transcutaneous electrical nerve stimulators |
| 1 Unit | Ultraviolet lamps (water and air cooled) |
| 2 Units | Hydrocollator machines with various sizes of packs |

Hydrotherapy and cryotherapy

| | |
|---------|---|
| 1 Unit | Hydrotherapy pool |
| 4 Units | Ice Cold and hot pack units |
| 1 Unit | Deep Freezer/ Ice making machines |
| 2 Units | Hydrotherapy treatment baths of various sizes |
| 2 Units | Hydrotherapy treatment tanks of various sizes |
| | Vapo-coolant spray and gels |

Exercise therapy, manual therapy and spine tools

| | |
|-----------|--|
| 2 Units | Bicycle ergometers |
| 2 Units | Motorised treadmills |
| 1 Unit | Multigym |
| 1 Unit | Stepper device |
| 2 Units | Cervical traction units |
| 1 Unit | Lumbar traction unit |
| 2 Units | Rowing machine |
| 6 Units | Medicine balls of varying sizes |
| 4 Units | Biomechanical ankle support (wobble board) |
| 3 Units | Re-education parallel bars |
| 2 Units | Tilt bed |
| 12 Units | Treatment surfaces mackintosh |
| 24 Pieces | Towels of various sizes |
| 16 Units | Examination beds and plinths |
| 6 Units | Exercise mats |
| 2 Units | Walking re-education parallel bars |
| 4 Units | Ankle wobble boards |
| 2 Units | Rehabilitation staircase |
| 4 Units | Exercise balance balls of different sizes |



3 Sets Gymnasium furniture

Staffing

Academic

1. All academic staff in the Department of Physiotherapy shall be those with current license to practice physiotherapy in Nigeria and who have obtained higher degrees, preferably in physiotherapy.
2. The minimum ratio of academic staff to students in the DPT programme shall be 1:10.
3. The programme should have at least 70% of its total academic staff possessing PhD degree or relevant postgraduate professional qualifications
4. No Lecturer will be promoted to the rank of Senior Lecturer without a PhD degree or relevant postgraduate professional qualifications in Physiotherapy.
5. There should be availability of adequately qualified lecturers in a minimum of six (6) out of the eleven (11) areas of Physiotherapy specialisations with at least two (2) lecturers (of Lecturer I / II and a Senior lecturer status and above) for each specialty in order to operate a DPT curriculum.

The areas of specialties in physiotherapy are:

1. Cardiopulmonary Physiotherapy
2. Orthopaedic and Musculoskeletal Physiotherapy
3. Neurology and Mental Health Physiotherapy
4. Physiotherapy in Women's Health
5. Geriatric Physiotherapy
6. Community and Primary Health Physiotherapy
7. Child Health Physiotherapy
8. Sports and Recreational Physiotherapy
9. Ergonomics and Occupational Health Physiotherapy
10. Physiotherapy in Oncology
11. Integumentary and Skin Care Physiotherapy

Non-academic staff:

There shall be technical and administrative staff support for the programme, with the following specifically domiciled in the Department:

1. Two technologists to maintain and repair the equipment used in physiotherapy and provide laboratory support
2. Two administrative officers with at least one not below the rank of Assistant Registrar;
3. Library officer to manage the Departmental virtual and physical libraries
4. Secretarial staff including at least one in the rank of confidential secretary
5. Secretarial staff;
6. Information and Communication Technology (ICT) Officer,
7. Office Support Staff including office assistants.

Library

1. There shall be a Department of Physiotherapy-based hybrid of physical and virtual library with modern information communication technology facilities for electronic access and retrieval of information.
2. Additionally, the Faculty/College/University Library shall have a dedicated section or floor with adequate provision of current books and journals, periodicals and bibliographic indices on Physiotherapy.



Classroom, Laboratories and Office Spaces

Resources requirements for teaching and learning

The University shall ensure the provision of adequate human, physical, equipment and library facilities in all the learning areas with strong information communication technology infrastructure for the implementation of these minimum standards.

The University shall provide:

1. purpose-built physiotherapy building structure and necessary facilities with adequate and appropriate equipment similar to real-life situation to facilitate effective teaching and learning of the different areas of this curriculum, with adequate maintenance back-up;
2. Each professor shall have a spacious office with an ante-office for the secretary or administrative staff working with the professor

Classroom

The standard requirement of 0.65m² per full-time student should be maintained. Thus the minimum total space requirement for a faculty or department shall be the product of its total full time equivalent student enrolment (FTE) and the minimum space requirement per full-time equivalent i.e. (FTE) 0.65m².

Office

In this respect, each academic staff should have an office space of at least 25 square metres taking into cognisance the status/cadre of the staff

In addition, there should be for the Faculty, a Dean's office and for each Department a Head of Department's office with attached offices for their supporting staff as specified below in m²:

| | | |
|----------------------------------|---|-------|
| Professor's office | - | 18.50 |
| Head of Department's office | - | 18.50 |
| Tutorial teaching staff's office | - | 13.50 |
| Other teaching staff space | - | 7.00 |
| Technical staff space | - | 7.00 |
| Secretarial space | - | 7.00 |
| Staff research laboratory | - | 16.50 |
| Seminar Space/per student | - | 1.85 |
| Laboratory space (per student) | - | 7.50 |



B.Sc. Prosthetics and Orthotics

Overview

Prosthetics and Orthotics is one of the professions engaged in the rehabilitation of individuals with disability, persons with musculoskeletal and neuromuscular problems. Other professions in rehabilitation business are Physiotherapy, Occupational therapy, Speech therapy and Audiology. Prosthetists are involved with producing and fitting back missing body parts like the lower and upper limbs called exoprosthesis. They also produce endo prosthesis which are fitted inside the patients' body, for example, to replace broken bones. The prosthetists also apply plaster casting to patients for various conditions especially in bone setting. Orthotists are concerned primarily with producing braces and other gadgets to support weak muscles to aid rehabilitation. The Prosthetics and Orthotics professionals work to bring back functionality to patients with disability undergoing rehabilitation with the goal of making the patient independent and useful member of the society.

Philosophy

The philosophy of undergraduate degree in Prosthetics and Orthotics (P & O) programme is based on the science and the knowledge of the structure and mechanics of the human body that provides the basis for adaptation of natural and artificial products in construction and utilisation of devices and appliances to enhance wellness, body mechanics and functioning. The programme believes in evidence driven and quality training of P & O professionals that are equipped with adequate theoretical knowledge, clinical skills, sense of purpose and devotion to patient care and comfort using prosthetic and orthotic devices/appliances.

Objectives

The programme will train Prosthetics and Orthotics (P & O) professionals that will be able to design, assemble and fit prosthetic and orthotic appliances on patients and clients in conformity with the prescription of medical rehabilitation practitioners in the rehabilitation of patients.

The P & O professionals on completion of this programme should be to be able to:

1. design all forms of prosthetic and orthotic devices;
2. fabricate prosthetic and orthotic appliances according to prescription;
3. identify component parts of prosthetic and orthotic appliances;
4. interpret specifications for prosthetic and orthotic appliances;
5. assemble and fit prosthetic and orthotic components;
6. produce basic prosthetic, orthotic appliances and mobility aids;
7. apply casting techniques on patients;
8. participate in clinical assessment of prosthetic and orthotic cases; and
9. maintain prosthetic and orthotic appliances.

Unique Features of the Programme

The Prosthetics and Orthotics programme is a specialised profession that uses Engineering and Medical knowledge to produce equipment to aid rehabilitation and mobility.



Employability Skills

At the end of the Prosthetics and Orthotics training programme, graduates should have acquired skills to:

1. fabricate/assemble and undertake fitting of Prostheses and Orthoses appliances for patients and clients in conformity with prescription;
2. they would also be in position to undertake assessment and casting of orthotic devices for patients with limb, spinal or other relevant deformities;
3. the training will also afford them with computer skills that will aid them in designing modern and state of the arts prosthetics and orthotic products; and
4. this curriculum also affords the graduates ability to be self-employed and to be successful in business and also the skills to conduct research including, proposal writing, data collection and analysis, interpretation of findings and report writing for dissertation or publication in learned journals.

21st Century Skills

1. Collaboration and team work
2. Creativity and imagination
3. Critical thinking
4. Problem solving
5. Flexibility and adaptability
6. Information Literacy
7. Leadership
8. Civic literacy and citizenship
9. Social responsibility
10. Technology literacy
11. Initiative

Behavioural attributes

The products of P & O programme shall be professionals who have acquired high level of theoretical knowledge, clinical skills and sense of purpose. They should have a good mastery of the basic P & O procedures, shall exhibit understanding of the concept of the health care system and health care. They shall respect the dignity of the patients and exhibit high sense of responsibility in patient care. They shall be law abiding and practice within the ethical limits of the profession

Admission and Graduation Requirements

The two pathways by which candidates can be admitted into the programme are: the Unified Tertiary Matriculation (UTME) and Direct Entry.

Five-Year Degree Programme-Unified Tertiary Matriculation Examination (UTME)

In addition to UTME requirements, candidates seeking enrolment into the B.Sc. (Prosthetics and Orthotics programme must obtain Senior Secondary Certificate passes at credit level (at not more than two sittings) in five subjects including Mathematics, Physics, Chemistry, Biology and English Language.



Direct Entry

Candidates seeking admission into the B.Sc. Prosthetics and Orthotics programme must obtain two A Level passes in Biology, Chemistry and Physics, provided they have satisfied the requirements of UTME as stated above. Also, holders of HND in Prosthetics and Orthotics with Upper Merit will also be admitted into 3rd year provided they have satisfied the requirements of UTME as stated above.

Graduation Requirements

To graduate, a student should have undergone four or five years of study depending on his/her entry point. Course workload must meet the graduation requirements of the university.

To be eligible for graduation, students must fulfil all undergraduate and institutional requirements. These requirements shall include:

1. successful completion of all required prerequisite and basic sciences courses.
2. successful completion of required basic medical science courses.
3. successful completion of required courses on POT core competency.
4. Successful defence of the undergraduate dissertation, project or critically appraised topic.

Global Course Structure

100 Level

| Course Code | Course Title | Unit(s) | Status | LH | PH |
|-------------|----------------------------------|-----------|--------|----|----|
| GST 111 | Communication in English | 2 | C | 15 | 45 |
| GST 112 | Nigerian Peoples and Culture | 2 | C | 30 | - |
| BIO 101 | General Biology I | 2 | C | 30 | - |
| BIO 102 | General Biology II | 2 | C | 30 | - |
| BIO 107 | General Biology Practical I | 1 | C | - | 45 |
| BIO 108 | General Biology Practical II | 1 | C | - | 45 |
| CHM 101 | General Chemistry I | 2 | C | 30 | - |
| CHM 102 | General Chemistry II | 2 | C | 30 | - |
| MAT 101 | Elementary Mathematics I | 2 | C | 30 | - |
| MAT 102 | Elementary Mathematics II | 2 | C | 30 | - |
| COS102 | Introduction to Computer Science | 3 | C | 30 | 45 |
| PHY 101 | General Physics I | 2 | C | 30 | - |
| PHY 102 | General Physics II | 2 | C | 30 | - |
| PHY 107 | General Physics Practical I | 1 | C | - | 45 |
| PHY 108 | General Physics Practical II | 1 | C | - | 45 |
| | Total | 27 | | | |

200 Level

| Course Code | Course Title | Unit(s) | Status | LH | PH |
|-------------|---------------------------------------|---------|--------|----|----|
| GST 212 | Philosophy, Logic and Human Existence | 2 | C | 30 | - |
| ENT 211 | Entrepreneurship and Innovation | 2 | C | 30 | - |
| ANA 201 | Anatomy of Upper and Lower Limb | 2 | C | 30 | - |
| PIO 201 | Introductory Physiology and Blood | 2 | C | 30 | - |



| | | | | | |
|---------|---|-----------|---|----|----|
| ENG 201 | General Workshop Practice | 3 | C | 30 | 45 |
| ANA 204 | Anatomy of Thorax, Abdomen, Pelvis and Perineum | 2 | C | 30 | 45 |
| POT 202 | First Aid in Prosthetics & Orthotics | 2 | C | 30 | - |
| | Total | 18 | | | |

300 Level

| Course Code | Course Title | Unit(s) | Status | LH | PH |
|-------------|---|-----------|--------|----|----|
| GST 312 | Peace and Conflict Resolution | 2 | C | 30 | - |
| ENT 312 | Venture Creation | 2 | C | 15 | 45 |
| POT 301 | Biomechanics I | 2 | C | 30 | - |
| POT 303 | Lower Limb Orthotics I | 2 | C | 30 | - |
| POT 305 | Spinal and Upper Limb Orthotics I | 2 | C | 30 | - |
| POT 307 | Lower Limb Prosthetics I | 2 | C | 30 | - |
| POT 309 | Plaster and Casting Techniques I | 3 | C | 30 | 45 |
| POT 311 | Upper Limb Prosthetics | 2 | C | 30 | - |
| POT 315 | Therapeutic Skills & Splintage, Slings & Bandages | 2 | C | 15 | 45 |
| POT 304 | Lower Limb Orthotics II | 2 | C | 30 | - |
| POT 306 | Spinal and Upper Limb Orthotics II | 2 | C | 30 | - |
| POT 308 | Lower Limb Prosthetics II | 2 | C | 30 | - |
| POT 310 | Plaster and Casting Techniques II | 3 | C | 30 | 45 |
| POT 314 | Clinical Pharmacology | 2 | C | 30 | - |
| | Total | 30 | | | |

400 Level

| Course Code | Course Title | Unit(s) | Status | LH | PH |
|-------------|---|-----------|--------|----|-----|
| POT 401 | Computer Aided Design of Assistive Devices | 2 | C | 15 | 45 |
| POT 411 | Research Methodology | 2 | C | 30 | - |
| POT 413 | Dissertation Seminar | 2 | C | 30 | - |
| POT 415 | Therapeutic Exercises and Assistive Devices | 2 | C | 15 | 45 |
| POT 419 | Introduction to Robotics | 2 | C | 30 | - |
| POT 421 | Orthopedic Pathology 1 | 2 | C | 30 | - |
| SIWES | Prosthetics and Orthotics Hospital Posting | 6 | C | - | 270 |
| | Total | 18 | | | |



500 Level

| Course Code | Course Title | Unit(s) | Status | LH | PH |
|-------------|--|-----------|--------|----|----|
| POT 501 | Prosthetics and Orthotics Business and Profitability | 2 | C | 30 | - |
| POT 507 | Biomechanics II | 2 | C | 15 | 45 |
| POT 503 | Orthopaedic Pathology II | 2 | C | 30 | - |
| POT 506 | General Prosthetics and Orthotics Practice | 3 | C | 15 | 90 |
| POT 512 | Research Project | 4 | C | 60 | - |
| | Total | 13 | | | |

Course Contents and Learning Outcomes

100 Level

GST 111: Communication in English

(2 Units C: LH 15; PH 45)

Learning Outcomes

At the end of this course, students should be able to:

1. identify possible sound patterns in English Language;
2. list notable Language skills;
3. classify word formation processes;
4. construct simple and fairly complex sentences in English;
5. apply logical and critical reasoning skills for meaningful presentations;
6. demonstrate an appreciable level of the art of public speaking and listening; and
7. write simple and technical reports.

Course Contents

Sound patterns in English Language (vowels and consonants, phonetics and phonology). English word classes (lexical and grammatical words, definitions, forms, functions, usages, collocations). Sentence in English (types: structural and functional, simple and complex). Grammar and Usage (tense, mood, modality and concord, aspects of language use in everyday life). Logical and Critical Thinking and Reasoning Methods (Logic and Syllogism, Inductive and Deductive Argument and Reasoning Methods, Analogy, Generalisation and Explanations). Ethical considerations, Copyright Rules and Infringements. Writing Activities: (Pre-writing, Writing, Post writing, Editing and Proofreading; Brainstorming, outlining, Paragraphing, Types of writing, Summary, Essays, Letter, Curriculum Vitae, Report writing, Note making and many others. Mechanics of writing). Comprehension Strategies: (Reading and types of Reading, Comprehension Skills, 3RsQ). Information and Communication Technology in modern Language Learning. Language skills for effective communication. Major word formation processes. Writing and reading comprehension strategies. Logical and critical reasoning for meaningful presentations. Art of public speaking and listening.



GST 112: Nigerian Peoples and Culture

(2 Units C: LH 30)

Learning Outcomes

At the end of the course, students should be able to:

1. analyse the historical foundation of the Nigerian culture and arts in pre-colonial times;
2. list and identify the major linguistic groups in Nigeria;
3. explain the gradual evolution of Nigeria as a political unit;
4. analyse the concepts of Trade, Economic and Self-reliance status of the Nigerian peoples towards national development;
5. enumerate the challenges of the Nigerian State towards Nation building;
6. analyse the role of the Judiciary in upholding people's fundamental rights.
7. identify acceptable norms and values of the major ethnic groups in Nigeria; and
8. suggest possible solutions to identifiable Nigerian environmental, moral and value problems.

Course Contents

Nigerian history, culture and art up to 1800 (Yoruba, Hausa and Igbo peoples and culture; peoples and culture of the ethnic minority groups). Nigeria under colonial rule (advent of colonial rule in Nigeria; Colonial administration of Nigeria). Evolution of Nigeria as a political unit (amalgamation of Nigeria in 1914; formation of political parties in Nigeria; Nationalist movement and struggle for independence). Nigeria and challenges of nation building (military intervention in Nigerian politics; Nigerian Civil War). Concept of trade and economics of self-reliance (indigenous trade and market system; indigenous apprenticeship system among Nigeria people; trade, skill acquisition and self-reliance). Social justices and national development (law definition and classification. Judiciary and fundamental rights. Individual, norms and values (basic Nigeria norms and values, patterns of citizenship acquisition; citizenship and civic responsibilities; indigenous languages, usage and development; negative attitudes and conducts. Cultism, kidnapping and other related social vices). Re-orientation, moral and national values (The 3R's – Reconstruction, Rehabilitation and Re-orientation; Re-orientation Strategies: Operation Feed the Nation (OFN), Green Revolution, Austerity Measures, War Against Indiscipline (WAI), War Against Indiscipline and Corruption (WAIC), Mass Mobilisation for Self-Reliance, Social Justice and Economic Recovery (MAMSER), National Orientation Agency (NOA). Current socio-political and cultural developments in Nigeria.

BIO 101: General Principles of Biology

(2 Units C: LH 30)

Learning Outcomes

At the end of lectures in Plant Biology, students should be able to:

1. explain cells structure and organisations;
2. summarise functions of cellular organelles;
3. characterise living organisms and state their general reproduction;
4. describe the interrelationship that exists between organisms;
5. discuss the concept of heredity and evolution; and
6. enumerate habitat types and their characteristics.



Course Contents

Cell structure and organisation. functions of cellular organelles. characteristics and classification of living things. chromosomes, genes their relationships and importance. General reproduction. Interrelationships of organisms (competitions, parasitism, predation, symbiosis, commensalisms, mutualism, saprophytism). Heredity and evolution (introduction to Darwinism and Lamarckism, Mendelian laws, explanation of key genetic terms). Elements of ecology and types of habitat.

BIO: 102 General Principles of Biology II

(2 Units C: LH 30)

Learning Outcomes

At the end of the lectures in Introductory Ecology, students should be able to:

1. List the characteristics, methods of identification and classification of viruses, bacteria and fungi;
2. state the unique characteristics of plant and animal kingdoms;
3. describe ecological adaptations in the plant and animal kingdoms;
4. explain nutrition, respiration, excretion and reproduction in plants and animals; and
5. describe growth and development in plants and animals.

Course Contents

Basic characteristics, identification and classification of viruses, bacteria and fungi. A generalised survey of the plant and animal kingdoms based mainly on the study of similarities and differences in the external features. Ecological adaptations. Briefs on physiology to include nutrition, respiration, circulatory systems, excretion, reproduction, growth and development.

CHM 101: General Chemistry I

(2 Units C: LH 30)

Learning Outcomes

At the end of this course, students should be able to:

1. define atom, molecules and chemical reactions;
2. discuss the Modern electronic theory of atoms;
3. write electronic configurations of elements on the periodic table;
4. justify the trends of atomic radii, ionization energies, electronegativity of the elements based on their position in the periodic table;
5. identify and balance oxidation – reduction equation and solve redox titration problems;
6. illustrate shapes of simple molecules and hybridised orbitals;
7. identify the characteristics of acids, bases and salts, and solve problems based on their quantitative relationship;
8. apply the principles of equilibrium to aqueous systems using LeChatelier's principle to predict the effect of concentration, pressure and temperature changes on equilibrium mixtures;
9. analyse and perform calculations with the thermodynamic functions, enthalpy, entropy and free energy; and
10. determine rates of reactions and its dependence on concentration, time and temperature.



Course Contents

Atoms, molecules and chemical reaction. Chemical equation and stoichiometry. Atomic structure and periodicity. Modern electronic theory of atoms. Radioactivity. Chemical bonding. Properties of gases. Equilibria and Thermodynamics. Chemical Kinetic. Electrochemistry.

CHM 102: General Chemistry II

(2 Units C: LH 30)

Learning Outcomes

At the end of this course, students should be able to:

1. state the importance and development of organic chemistry;
2. define fullerenes and its applications;
3. discuss electronic theory;
4. determine the qualitative and quantitative of structures in organic chemistry;
5. describe rules guiding nomenclature and functional group classes of organic chemistry;
6. determine rate of reaction to predict mechanisms of reaction;
7. identify classes of organic functional group with brief description of their chemistry;
8. discuss comparative chemistry of group 1A, IIA and IVA elements; and
9. describe basic properties of Transition metals.

Course Contents

Historical survey of the development and importance of Organic Chemistry. Fullerenes as fourth allotrope of carbon, uses as nanotubules, nanostructures, nanochemistry. Electronic theory in organic chemistry. Isolation and purification of organic compounds. Determination of structures of organic compounds including qualitative and quantitative analysis in organic chemistry. Nomenclature and functional group classes of organic compounds. Introductory reaction mechanism and kinetics. Stereochemistry. The chemistry of alkanes, alkenes, alkynes, alcohols, ethers, amines, alkyl halides, nitriles, aldehydes, ketones, carboxylic acids and derivatives. The Chemistry of selected metals and non-metals. Comparative chemistry of group IA, IIA and IVA elements. Introduction to transition metal chemistry.

MTH 101: Elementary Mathematics (Algebra and Trigonometry) (2 Units C: LH 30)

Learning Outcomes

At the end of the course students should be able to:

1. explain basic definition of Set, Subset, Union, Intersection, Complements and use of Venn diagrams;
2. solve quadratic equations;
3. solve trigonometric functions;
4. identify various types of numbers; and
5. solve some problems using Binomial theorem.

Course contents

Elementary set theory; subset, union, intersection, complements, venn diagrams. Real numbers; Integers, Rational and Irrational numbers, mathematical, induction, Sequences and Series, Theory of Quadratic equations, Binomial theorem. Complex numbers; Algebra of complex numbers; the Argand Diagram. De-Moivre's theorem, nth roots of unity, Circular measure, Trigonometric functions of angles of any magnitude, addition and factor formulae.



MTH 102: Elementary Mathematics II (Calculus)

(2 Units C: LH 30)

Learning Outcomes

At the end of the course, students should be able to:

1. identify types of rules in Differentiation and Integration;
2. explain the meaning of Function of a real variable, graphs, limits and continuity; and
3. solve some applications of definite integrals in areas and volumes.

Course Contents

Function of a real variable, graph, limits and idea of continuity. The derivative as limit of rate of change. Techniques of differentiation. Extreme curve sketching; Integration as an inverse of differentiation. Methods of integration, definite integrals. Application to areas and volumes.

COS 101: Introduction to Computing Sciences

(3 Units C: LH 30; PH 45)

Learning Outcomes

At the end of the course, students should be able to:

1. explain basic components of computers and other computing devices;
2. describe the various applications of computers;
3. explain information processing and its roles in the society;
4. describe the Internet, its various applications and its impact;
5. explain the different areas of the computing discipline and its specialisations; and
6. demonstrate practical skills on using computers and the internet.

Course Contents

Brief history of computing. Description of the basic components of a computer/computing device. Input/Output devices and peripherals. Hardware, software and human ware. Diverse and growing computer/digital applications. Information processing and its roles in society. The Internet, its applications and its impact on the world today. The different areas/programs of the computing discipline. The job specialisations for computing professionals. The future of computing.

Lab Work: Practical demonstration of the basic parts of a computer. Illustration of different operating systems of different computing devices including desktops, laptops, tablets, smart boards and smart phones. Demonstration of commonly used applications such as word processors, spreadsheets, presentation software and graphics. Illustration of input and output devices including printers, scanners, projectors and smartboards. Practical demonstration of the Internet and its various applications. Illustration of browsers and search engines. How to access online resources.

PHY 101: General Physics I (Mechanics)

(2 Units C: LH 30)

Learning Outcomes

At the end of the course, the student should be able to;

1. identify and deduce the physical quantities and their units;
2. differentiate between vectors and scalars;
3. describe and evaluate motion of systems on the basis of the fundamental laws of mechanics;
4. apply Newton's laws to describe and solve simple problems of motion;
5. evaluate work, energy, velocity, momentum, acceleration, and torque of moving or rotating objects;



6. explain and apply the principles of conservation of energy, linear and angular momentum;
7. describe the laws governing motion under gravity; and
8. explain motion under gravity and quantitatively determine behaviour of objects moving under gravity.

Course Contents

Space and time. Units and dimension, Vectors and Scalars. Differentiation of vectors: displacement, velocity and acceleration. Kinematics. Newton laws of motion (Inertial frames, Impulse, force and action at a distance, momentum conservation). Relative motion. Application of Newtonian mechanics. Equations of motion. Conservation principles in physics. Conservative forces. Conservation of linear momentum. Kinetic energy and work. Potential energy. System of particles. Centre of mass. Rotational motion: Torque, vector product, moment, rotation of coordinate axes and angular momentum. Polar coordinates. Conservation of angular momentum. Circular motion. Moments of inertia. gyroscopes and precession. Gravitation: Newton's Law of Gravitation. Kepler's Laws of Planetary Motion. Gravitational Potential Energy. Escape velocity. Satellites motion and orbits.

PHY 102: General Physics II (Electricity & Magnetism)

(2 Units C: LH 30)

Learning Outcomes

At the end of this course, the student should be able to:

1. describe the electric field and potential, and related concepts, for stationary charges;
2. calculate electrostatic properties of simple charge distributions using Coulomb's law, Gauss's law and electric potential;
3. describe and determine the magnetic field for steady and moving charges;
4. determine the magnetic properties of simple current distributions using Biot-Savart and Ampere's law;
5. describe electromagnetic induction and related concepts, and make calculations using Faraday and Lenz's laws;
6. explain the basic physical of Maxwell's equations in integral form;
7. evaluate DC circuits to determine the electrical parameters; and
8. determine the characteristics of ac voltages and currents in resistors, capacitors, and Inductors.

Course Contents

Forces in nature. Electrostatics; electric charge and its properties, methods of charging. Coulomb's law and superposition. electric field and potential. Gauss's law. Capacitance. Electric dipoles. Energy in electric fields. Conductors and insulators, current, voltage and resistance. Ohm's law and analysis of DC circuits. Magnetic fields. Lorentz force. Biot-Savart and Ampère's laws. magnetic dipoles. Dielectrics. Energy in magnetic fields. Electromotive force. Electromagnetic induction. Self and mutual inductances. Faraday and Lenz's laws. Step up and step-down transformers: Maxwell's equations. Electromagnetic oscillations and waves. AC voltages and currents applied to inductors, capacitors, resistance, and combinations.



PHY 107: General Experimental Physics I

(2 Units C: PH 45)

Learning Outcomes

At the end of this course, the student should be able to;

1. conduct measurements of some physical quantities;
2. make observations of events, collect and tabulate data;
3. identify and evaluate some common experimental errors;
4. plot and analyse graphs; and
5. draw conclusions from numerical and graphical analysis of data.

Course Contents

This introductory course emphasises quantitative measurements, the treatment of measurement errors and graphical analysis. A variety of experimental techniques should be employed. The experiments include studies of meters, the oscilloscope, mechanical systems, electrical and mechanical resonant systems, light, heat, viscosity etc., covered in PHY 101 and PHY 102. However, emphasis should be placed on the basic physical techniques for observation, measurements, data collection, analysis and deduction.

PHY 108: General Practical Physics II

(1 Unit C: PH 45)

Learning Outcomes

At the end of this course, the student should be able to:

1. conduct measurements of some physical quantities;
2. make observations of events, collect and tabulate data;
3. identify and evaluate some common experimental errors;
4. plot and analyse graphs;
5. draw conclusions from numerical and graphical analysis of data; and
6. prepare and present practical reports.

Course Contents

This practical course is a continuation of PHY 107 and is intended to be taught during the second semester of the 100 level to cover the practical aspect of the theoretical courses that have been covered with emphasis on quantitative measurements. The treatment of measurement errors, and graphical analysis. However, emphasis should be placed on the basic physical techniques for observation, measurements, data collection, analysis and deduction.

200 Level courses

GST 212: Philosophy, Logic and Human Existence

(2 Units C: LH 30)

Learning Outcomes

A student who has successfully gone through this course should be able to:

1. enumerate the basic features of philosophy as an academic discipline;
2. identify the main branches of philosophy & the centrality of logic in philosophical discourse;
3. describe the elementary rules of reasoning;
4. distinguish between valid and invalid arguments;
5. think critically and assess arguments in texts, conversations and day-to-day discussions;



6. critically assesses the rationality or otherwise of human conduct under different existential conditions;
7. develop the capacity to extrapolate and deploy expertise in logic to other areas of knowledge, and
8. guide his or her actions, using the knowledge and expertise acquired in philosophy and logic.

Course Contents

Scope of philosophy; notions, meanings, branches and problems of philosophy. Logic as an indispensable tool of philosophy. Elements of syllogism, symbolic logic— the first nine rules of inference. Informal fallacies, laws of thought, nature of arguments. Valid and invalid arguments, logic of form and logic of content — deduction, induction and inferences. Creative and critical thinking. Impact of philosophy on human existence. Philosophy and politics, philosophy and human conduct, philosophy and religion, philosophy and human values, philosophy and character molding and many others.

ENT 211: Entrepreneurship and Innovation

(2 Units C: LH 30)

Learning Outcomes

At the end of this course, students should be able to:

1. explain the concepts and theories of entrepreneurship, intrapreneurship, opportunity seeking new value creation, and risk taking;
2. state the characteristics of an entrepreneur;
3. analyse the importance of micro and small businesses in wealth creation, employment and financial independence;
4. engage in entrepreneurial thinking;
5. identify key elements in innovation;
6. describe stages in enterprise formation, partnership and networking including business planning;
7. describe contemporary entrepreneurial issues in Nigeria, Africa and the rest of the world; and
8. state the basic principles of e-commerce.

Course Contents

Concept of Entrepreneurship (Entrepreneurship, Intrapreneurship/Corporate Entrepreneurship,). Theories, Rationale and relevance of Entrepreneurship (Schumpeterian and other perspectives, Risk-Taking, Necessity and opportunity-based entrepreneurship and Creative destruction). Characteristics of Entrepreneurs (Opportunity seeker, Risk taker, Natural and Nurtured, Problem solver and change agent, Innovator and creative thinker). Entrepreneurial thinking (Critical thinking, Reflective thinking, and Creative thinking). Innovation (Concept of innovation, Dimensions of innovation, Change and innovation, Knowledge and innovation). Enterprise formation, partnership and networking (Basics of Business Plan, Forms of business ownership, Business registration and Forming alliances and joint ventures). Contemporary Entrepreneurship Issues (Knowledge, Skills and Technology, Intellectual property, Virtual office, Networking). Entrepreneurship in Nigeria (Biography of inspirational Entrepreneurs, Youth and women entrepreneurship, Entrepreneurship support institutions, Youth enterprise networks and Environmental and cultural barriers to entrepreneurship). Basic principles of e-commerce.

ANA 201: Anatomy of Upper and Lower limb

(2 Units C: LH 15; PH 45)



Learning Outcomes

At the end of the course, student should be able to:

1. define fundamental anatomical terminology and discuss the anatomical position;
2. describe the anatomy of the musculoskeletal system, including the axial skeleton; appendicular skeleton, appendicular and axial muscles, and arthrology;
3. describe the general features of the bones of the upper and lower limbs;
4. identify the major muscles of the upper and lower limbs;
5. explain the types and structure of the joints of the upper and lower limbs;
6. correlate between the attachment of the muscles and their functions on the different joints;
7. identify the major nerves of the upper and lower limbs;
8. describe the functional components of each of the major nerves and its distribution;
9. identify and describe the course of the major superficial veins of the upper and lower limbs; and
10. name the major arteries of the upper and lower limbs.

Course Contents

Descriptive terms, planes and terms of relationship of the human body, terms of comparison, attachment of muscles, types of muscles, movements of joints. Osteology, principles of kinesiology, general organization of body system. Cutaneous innervation of the upper limb; pectoral region; breast; axilla; shoulder region; arm and cubital fossa; flexor compartment of forearm; extensor compartment of forearm; hand; venous and lymphatic drainage of the upper limb. Applied anatomy of nerves; blood supply of the upper limb. Cutaneous innervation of the lower limb; femoral triangle; adductor canal and medial side of the thigh; gluteal region; back of the thigh, popliteal fossa; extensor compartment of the leg and dorsum of the foot; peroneal and flexor compartment of the leg; sole of the foot, arches of the foot; mechanism of walking; venous and lymphatic drainage of the lower limb; applied anatomy of the nerves and blood supply to the lower limb.

ANA 204: Anatomy of Thorax, Abdomen, Pelvis & Perineum (2 Units C: LH 15; PH 45)

Learning Outcomes

At the end of the course, the student should be able to:

1. identify the bones and bony markings of the thorax, abdomen, pelvis and perineum;
2. list the nine regions and four quadrants and the principal organs and structures that lie deep to them and which can be palpated in those regions;
3. describe the muscular components of the anterior abdominal wall, blood supply and innervation of the anterior abdominal wall;
4. identify the arteries, veins and lymphatics of the thorax, abdomen, pelvis and perineum; be able to list the main branches of the aorta and their territories; and describe the disposition of the main veins in the abdomen;
5. describe the parts, position, vertebral levels and surface markings of the stomach and duodenum as well as the position, vertebral levels and surface markings of the pancreas, spleen, liver and gall bladder;
6. describe the greater and lesser omenta and the lesser sac;
7. describe the disposition of the jejunum and ileum; describe the surface anatomy of the caecum, ascending colon, transverse colon, descending colon and sigmoid colon;



8. describe the anatomy of the pelvic diaphragm, its midline raphe, perineal body, attachment points and the structures passing through it in males and females;
9. describe the anatomy of the ischio-anal fossa;
10. describe the anatomy and relations of the ovary, uterine tubes, uterus, cervix and vagina, including their peritoneal coverings;
11. describe the anatomy and neurovascular supply of the clitoris, vulva and vagina; the anatomy of the urogenital diaphragm and perineal 'pouches';
12. describe the origin, course and distribution of the pudendal nerves and the sites of pudendal nerve block;
13. describe the lymphatic drainage of the foregut, pelvic and perineal organs;

Course Contents

Introduction to the trunk; thoracic cage; intercostal space; thoracic cavity; pleural cavities; lungs; mediastinum general; anterior & superior mediastinum; middle; mediastinum – heart and pericardium; heart – applied anatomy; posterior mediastinum. General anatomy of abdomen and abdominal regions; anterior abdominal wall muscles; inguinal canal – inguinal and femoral hernias; peritoneal cavity and spaces; abdominal oesophagus, stomach, duodenum, spleen, small intestine, large intestine, appendix; portal venous system; portocaval anastomoses; liver and gallbladder. Pancreas and biliary apparatus; kidneys, suprarenal glands, and ureters; diaphragm; posterior abdominal wall; aorta and inferior vena cava; posterior abdominal wall muscles; lumbosacral plexus; bony and ligamentous pelvis; pelvic diaphragm (floor); male reproductive organs; female reproductive organs; male and female external genitalia; perineum; rectum and anal canal; pelvic blood vessels; abdomino-pelvic nervous system.

POT 202: First Aid in Prosthetics and Orthotics

(2 Units C: LH 30)

Learning Outcomes

At the end of this course, the students should be able to:

1. discuss different aspects of first aid;
2. describe different items used in giving first aid to persons in a work place;
3. identify types of injuries based on level of injuries and bleeding; and
4. describe how to care and transport injured patients who need further evaluations and treatment.

Course Contents

Definition of First Aid, The qualities of First Aider, TRIAGE and the process of TRIAGE in First Aid. The process of sorting out cases based on severity of injuries i.e., bleeding, airway problem, cardio vascular problem. The principles of First Aid. The health conditions requiring 1st Aid: i.e. Trauma such as RTA and many others, non – Trauma such as sync pal attacks, shock, febrile conditions and many others. Definition of Basic Trauma Life Support (BTLS). Identify the levels of BTLS. Airway/cervical spine control; Breathing, Circulation, Exposure, Neurological Description of the process involved in the support and transport of injured persons. The materials required for first Aid.

PIO 201: Introductory Physiology and Blood

(2 Units C: LH 30)

Learning Outcomes

At the end of this course, the student should be able to:



1. describe the composition of a cell membrane;
2. explain how a potential difference across a membrane will influence the distribution of a cation and an anion;
3. describe how transport rates of certain molecules and ions are accelerated by specific membrane transport proteins;
4. distinguish between active (primary and secondary) transport, facilitated diffusion, and passive diffusion based on energy source and carrier protein involvement;
5. identify the mechanisms and role of selective transporters for amino acids, neurotransmitters, nutrients, etc.;
6. explain the general concepts of homeostasis and the principles of positive and negative feedback in physiological systems;
7. identify the site of erythropoietin production, the stimulus for its release, and the target tissue for erythropoietin action;
8. discuss the normal balance of red blood cell synthesis and destruction, including how imbalances in each lead to anemia or polycythemia;
9. list and differentiate the various types of leukocytes;
10. describe the role of thrombocytes in haemostasis; and
11. list clotting factors and discuss the mechanism of anti-coagulants.

Course Contents

Introduction and history of physiology. Structure and functions of cell membranes. Transport process. Special transport mechanism in amphibian bladder, kidney, gall bladder, intestine, astrocytes and exocrine glands. Biophysical principles. Homeostasis and control systems including temperature regulation. Biological rhythms. Composition and functions of blood. Haemopoiesis. WBC and differential count. Plasma proteins Coagulation, fibrinolysis and platelet functions. Blood groups – ABO system – Rh system. Blood transfusion – indication for collection and storage of blood, hazards of blood transfusions. Reticulo- endothelial system. Immunity and immunodeficiency disease and HIV.

POT 204: Materials Technology

(2 Units C: LH 30)

Learning Outcomes

The knowledge and competences gained in this course will afford the students the leverage to practice effectively and safely within a workshop environment.

The student should be able to meet the following learning objectives:

1. explain the important properties of various types of materials: metals, ceramics, polymers, and composites;
2. describe the relationships that exist between the structural elements of these materials and their characteristics;
3. explain mechanical strength and failure behaviour of these materials, along with techniques used to improve the mechanical and failure properties in terms of alteration of structural elements;
4. describe the basis for the selection of different materials for specific prosthetic and orthotic applications;
5. discuss the toxicity and safety issues associated with the use of specific materials;
6. describe the occupational health and safety policy and procedures in the workplace;
7. demonstrate proficiency in the use of hand tools and machine tools commonly used in the fabrication of orthopaedic devices.



Course Contents

Identification of materials commonly used in prosthetics and orthotics e. g. (a) Steel and its alloys (b) Nonferrous metals and their alloys, such as aluminium (c) Plastics, thermoforming, thermosetting, composites (d) Wood (e) Leather (f) Plaster of Paris (g) Adhesives and Elastic. Chemical composition and properties of the materials listed above. Plaster of Paris – Powdery $\text{CaSO}_4 + \text{H}_2\text{O}$, Steel – hard, strong, tough, Wood – breakable, dry season, Aluminium and many others, makeable, Leather and many others. soft, hide/skin, Plastic – breakable, hard. State the physical properties of the materials such as (a) Metals and alloys (i) Solid at room temperature, (ii) has high melting point, (iii) shining when cut, (iv) forms alloys. (v) Strong and tough, (vi) can be hammered into shape, (vii) good conductor of heat and electricity. (b) Non-Metals such as Leather, plaster of Paris, plastics, adhesives, (i) Low melting and boiling point, (ii) dull in appearance, (iii) brittle (breakable), (iv) poor conductor of electricity. Effect of acid, gases and salts on metals and alloys, non-metals used for prostheses and orthoses. Describe the effect of corrosion on metals for prostheses and orthoses. Difference in textures, permeability strength and weight in non-metals. Uses of metals and alloys in prosthetics and orthotics devices such as calipers, braces and many others. Uses of plastics in prosthetics and orthotics; such as KAFO, AFO, SPLINTS and many others. Uses of wood in prosthetics such as Artificial limb, SACH foot, Knee piece. Uses of leather in prosthetics and orthotics, such as ring padding, knee pad, cuff suspension, orthopaedic shoes and many others. Identification of the sources of the following materials used in Prosthetics and Orthotics. Metals, plastics, wood, leather, plaster of Paris (POP), adhesives Identification of the following tools and equipment used in Prosthetics and Orthotics. (a.) Vice to hold materials, b.) Hard saw to cut, c.) Guillotine machine to cut, d.) Shear machine to cut, e.) Grinding stones/machine, f.) Welding machine, g.) Vacuum machine, h.) Suction machine, i.) Oven, j.) Drill press m/c, k.) Lathe machine, l.) Craftsman carver, m.) Skiving machine. Maintenance of the tools and equipment used in Prosthetics and Orthotics. Identification of METALS materials to make calipers and braces. Identification of LEATHER materials to make Orthopaedic shoes, knee pads and many others. and Identification of LEATHER materials to make plaster cast technique. Identification of thermoplastic materials to mould socket and spaces. Identification of wood materials to carve socket in limbs. Identification of foam (polyethylene) materials to make extension in devices for cosmetic light finish. Identification of adhesives materials to form wood, leather plastic and many others.



ENG 201 General Workshop Practice

(3 Units C: LH 30: PH 45)

Learning Outcomes

At the end of this course, the students should be able to:

1. discuss basic Engineering ideas, different rules, fabrication ideas and simple Engineering procedures which prepares the student to take on basic workshop skills that will eventually be needed in the production of Prosthetics and Orthotics and other assistive devices for the physically challenged;
2. discuss occupational health and safety policy and procedures in the workplace; and
3. demonstrate proficiency in the use of hand tools and machine tools commonly used in the fabrication of orthopaedic devices.

Course Contents

General: Use of engineering measuring instruments such as callipers, gauges, and many others. Introduction to hand tools such as practice in wood planes, saws, sanders and pattern making, sampling and sizing techniques of raw materials. Sheet metal work: Production of sheet metal products-layouts, cutting and shaping, gas welding, soldering, brazing, fastening, assembly. Woodwork: Basic Woodworking principles, and tools-layout methods, cutting and shaping, finishing and evaluation, finished products. Industrial safety, behaviour analysis, safety consciousness, survey of sources of common accident, Accident prevention and control. Machine-shop Works, Lathe-work, instruction on metal working process, shaping, milling, grinding, drilling and metal spinning and many others. Design of simple jigs and fixtures automobile Work: Simple automobile diagnosis and repairs. Electrical workshop practice, convention and application of colours, codes and signs and many others, use of electrical tools, machines, cables, and conductors.

300 Level

GST 312: Peace and Conflict Resolution

(2 Units C: LH 30)

Learning Outcomes

At the end of the course, students should be able to:

1. analyse the concepts of peace, conflict and security;
2. list major forms, types and root causes of conflict and violence;
3. differentiate between conflict and terrorism; and
4. enumerate security and peace building strategies and describe the roles of international organisations, media and traditional institutions in peace building.

Course Contents

Concepts of peace, conflict and security in a multi-ethnic nation. Types and Theories of Conflicts: Ethnic, Religious, Economic, Geo-political Conflicts; Structural Conflict Theory, Realist Theory of Conflict, Frustration-Aggression Conflict Theory. Root causes of Conflict and Violence in Africa: Indigene and settlers Phenomenon; Boundaries/boarder disputes; Political disputes; Ethnic disputes and rivalries; Economic Inequalities; Social disputes; Nationalist Movements and Agitations; Selected Conflict Case Studies – Tiv-Junkun; ZangoKartaf, Chieftaincy and Land disputes and many others. Peace Building, Management of Conflicts and Security: Peace & Human Development. Approaches to Peace & Conflict Management --- (Religious, Government, Community Leaders and many others). Elements of Peace Studies and Conflict Resolution:



Conflict dynamics assessment Scales: Constructive & Destructive. Justice and Legal framework: Concepts of Social Justice; The Nigeria Legal System. Insurgency and Terrorism. Peace Mediation and Peace Keeping. Peace & Security Council (International, National and Local levels) Agents of Conflict resolution – Conventions, Treaties Community Policing: Evolution and Imperatives. Alternative Dispute Resolution, ADR. Dialogue b). Arbitration, c). Negotiation d). Collaboration and many others. Roles of International Organisations in Conflict Resolution. (a). The United Nations, UN and its Conflict Resolution Organs. (b). The African Union & Peace Security Council (c). ECOWAS in Peace Keeping. Media and Traditional Institutions in Peace Building. Managing Post-Conflict Situations/Crisis: Refugees. Internally Displaced Persons, IDPs. The role of NGOs in Post-Conflict Situations/Crisis

ENT 312: Venture Creation

(2 Units C: LH 15; PH 45)

Learning Outcomes

At the end of this course, students through case study and practical approaches, should be able to:

1. describe the key steps in venture creation;
2. spot opportunities in problems and in high potential sectors regardless of geographical location;
3. state how original products, ideas, and concepts are developed;
4. develop business concept for further incubation or pitching for funding;
5. identify key sources of entrepreneurial finance;
6. implement the requirements for establishing and managing micro and small enterprises;
7. conduct entrepreneurial marketing and e-commerce;
8. apply a wide variety of emerging technological solutions to entrepreneurship; and
9. appreciate why ventures fail due to lack of planning and poor implementation.

Course Contents

Opportunity Identification (Sources of business opportunities in Nigeria, Environmental scanning, Demand and supply gap/unmet needs/market gaps/Market Research, Unutilised resources, Social and climate conditions and Technology adoption gap). New business development (business planning, market research). Entrepreneurial Finance (Venture capital, Equity finance, Micro finance, Personal savings, small business investment organisations and Business plan competition). Entrepreneurial marketing and e-commerce (Principles of marketing, Customer Acquisition & Retention, B2B, C2C and B2C models of e-commerce, First Mover Advantage, E-commerce business models and Successful E-Commerce Companies,). Small Business Management/Family Business: Leadership & Management, Basic book keeping, Nature of family business and Family Business Growth Model. Negotiation and Business communication (Strategy and tactics of negotiation/bargaining, Traditional and modern business communication methods). Opportunity Discovery Demonstrations (Business idea generation presentations, Business idea Contest, Brainstorming sessions, Idea pitching). Technological Solutions (The Concept of Market/Customer Solution, Customer Solution and Emerging Technologies, Business Applications of New Technologies - *Artificial Intelligence (AI)*, *Virtual/Mixed Reality (VR)*, *Internet of Things (IoTs)*, *Blockchain*, *Cloud Computing*, *Renewable Energy* and many others. Digital Business and E-Commerce Strategies).



Learning Outcomes

At the end of this course, the student should be able to:

1. demonstrate an ability to apply principles of tissue mechanics to explain the principles of P&O treatment, (involving various force systems) and the practical problems encountered in prosthetics and orthotics;
2. use biomechanical terminology to describe position and motion of the human body.
3. discuss mechanical principles governing human motion;
4. utilise temporospatial, kinematic and kinetic information to distinguish between normal and abnormal function of the upper limbs, lower limbs & Spine;
5. analyse the forces at a skeletal joint for various static and dynamic activities;
6. demonstrate the ability to analyse forces and moments applied to the body by prosthetic and orthotic devices;
7. apply biomechanical principles to generate optimal solutions to clinical problems in prosthetics and orthotics; and
8. explain the concepts of differentiation and integration and evaluate derivatives and integrals of a function.

Course Contents

Identification of the anatomical parts of the human body; Explanation of the following human anatomical terms; coronal plane, sagittal plane, medial, Lateral, superior, inferior. Draw annotated diagram of the human limbs – leg to show bones or joints; muscles. Draw annotated diagram of the human to body to show bones; limbs and muscle. Description of the function of the various bones, joints and muscles and their interaction in human movement. The planes and reference point of the human body. Types of joints in the body such as Upper & Lower limb joints; functions of the various joints in the body. The interactive biomechanical forces of the body. Various joints of the body using the full skeleton. Major muscles of the upper and lower limbs. Functions of the action of the various muscles of the body; agonistic and antagonists of the muscle action in the upper and lower limbs of the human body. Definition of terms: gait cycle, heel strike, stance phase, swing phase, toe-off. Description of the sub-divisions of the stance phase thus: Heel strike, Foot – flat, Mid – Stance, Push – Off. Description of the sub-divisions of the swing phase: (a) acceleration, mid-swing, deceleration. Description of the normal and abnormal human locomotion; human gait cycle. Explanation of normal and abnormal human gait cycle. Determination of the division of gait cycle. Definition of the word “forces” and its application to various joints and muscle activity. Various forces in the upper and lower joints and muscles. Forces involved in normal human locomotion and gait cycle. Demonstration of the action of the gravitational force to joint motions in human locomotion. Explanation of the forces involved in walking; muscles that generate forces in various joints necessary for the following: support, balance, locomotion in relation to both upper and lower limbs; effect of external forces on normal human locomotion. Demonstration of the effect of external forces on normal human locomotion.



POT 303, POT 305, POT 306

Learning Outcomes

At the end of the course, student should be able to:

1. compare and contrast strategies for clinical assessment of patients and describe appropriate investigative techniques including patient history taking and physical examination;
2. recognise and describe the signs and symptoms of the most common pathologies which require orthotic solutions including, etiology, clinical presentation, prognosis and appropriate device management;
3. distinguish between the physical characteristics of the limbs and discuss the relative implication for device design;
4. describe and compare temporospatial and kinematics characteristics of normal and pathological gait and use this information to justify the selection and design of appropriate devices;
5. discuss biomechanical force systems and use these principles in generating an appropriate orthotic prescription;
6. describe the mechanics of materials and be able to apply these concepts to the design and construction of devices;
7. compare and contrast the functional characteristics of orthotic components.
8. formulate appropriate orthotic and prosthetic prescriptions for wide range clinical situations;
9. appreciate and describe the roles of key members of the rehabilitation team and identify how they interrelate with the Prosthetist/ Orthotist;
10. assess the medical condition of a patient related to their orthotic/ prosthetic management using appropriate investigative techniques which include patient history taking and clinical testing;
11. formulate an optimal orthotic solution using information from the patient assessment, other members of the rehabilitation team, medical charts;
12. communicate and discuss patient goals and expectations and discuss and debate the orthotic or prosthetic management with the patient, co-workers and other members of the rehabilitation team;
13. reliably measure and capture a positive cast or image of clients' appendage while correctly positioning the body part and if appropriate apply the necessary corrective force system;
14. create the final design of the orthosis through modification of the positive cast and/or tracing of the body part or, when indicated, measure and fit prefabricated devices;
15. identify, prescribe and justify selection of appropriate materials and componentry in the construction of the device;
16. construct the device using appropriate fabrication techniques in preparation for the initial fitting;
17. fit the device to the patient using static and dynamic functional criteria established from the original assessment;
18. evaluate the quality of the device fit to ensure the appropriate interface contouring, force application and trimlines;
19. identify problems related to device fit and/or alignment and be able to suggest and implement appropriate correction;
20. assess and solve orthotic problems as part of long-term patient care;
21. maintain accurate records of patient treatment and follow up as well as confidentiality of such information;



22. communicate effectively with patient, co-workers, and other health care professionals in such a manner that will ensure the highest quality of service and reflect a professional attitude on the part of the student; and
23. educate the client and/or caregiver on use, care and function of the device.

POT 303: Lower Limb Orthotics I

(1 Unit C: LH 15)

Course Contents

Various techniques used in bending orthotic materials to shape. Tools for bending in orthotic production. Bend various materials to different shapes to produce orthoses. The importance of holes in orthoses. How holes are made on different orthotic materials. Making of holes on relevant orthotic materials.

POT 304: Lower Limb Orthotics II

(2 Units C: LH 30)

Course Contents

The concept of transfer of patterns. Description of the indications for arch support. Cut out materials for fabrication of arch support. Fabrication arch support using stainless steel. Fabrication arch support using aluminum. Fabrication arch support using plastics materials. Patterns for producing stirrups. Transfer patterns for producing stirrups. Cut metal into different patterns. Make Rigid ankle stirrups Make flexible ankle stirrups for dorsi flexion and plantar flexion. Relevant materials for making bolts and nuts. Tools for making ankle foot orthoses. Make individual components of ankle foot orthoses. Assembling individual components. Construction of ankle foot orthoses using plastics. Construction ankle foot orthoses using metals. Description the peculiarity of different designs of ankle foot. Identification of tools for making knee ankle foot orthoses. Making of individual components of knee – ankle foot orthoses. Assembling individual components of knee-ankle foot orthoses. Construction knee-ankle foot orthoses using plastics. Construct knee-ankle foot orthoses using metals. Description the process of moulding. Identification of different materials for moulding. Moulding with different materials.

POT 305: Spinal and Upper Limb Orthotics I

(2 Units C: LH 30)

Course Contents

Definition and explanation of terms used in orthotics, such as: Orthotics, Orthosis, Orthotist, Orthoses. Identification and explanation of the basic materials for producing spinal and upper limb orthoses. Identification of the materials for fabricating; Cervical orthoses, spinal jacket, lumbar corset and belts. Identification the following materials for fabricating. (a) Finger orthoses, (b) Cock up splints, (c) Aeroplane splint, (d) Shoulder abduction splint.



POT 306: Spinal and Upper Limb Orthotics II

(2 Units C: LH 30)

Course Contents

Identification of orthoses for management for specific conditions; Scoliosis, Kyphosis, Kyphoscoliosis. Preparation patient for measurement for spinal and upper limb orthoses. Taking appropriate measurements for spinal and upper limb orthoses. Confirmation measurements taken from negative cast. Confirm measurements taken after modification. Fabrication orthoses for the following spinal conditions: - Scoliosis, Kyphosis, Kyphoscoliosis and Lordosis. Orthosis fittings.

POT 307, POT 308, POT 311

Learning Outcomes

These subjects are delivered in a coordinated manner with the practical part of the Prosthetic course. The student should be required to acquire and comprehend the necessary theoretical knowledge and to be able to integrate this effectively in clinical practice.

At the end of the course, student should be able to:

1. compare and contrast strategies for clinical assessment of patients and describe appropriate investigative techniques including patient history taking and physical examination;
2. recognise and describe the signs and symptoms of the most common pathologies which require prosthetic solutions including, etiology, clinical presentation, prognosis and appropriate device management;
3. distinguish between the physical characteristics of the limbs and discuss the relative implication for device design;
4. describe and compare temporospatial and kinematic characteristics of normal and pathological gait and use this information to justify the selection and design of appropriate devices;
5. describe the mechanics of materials and be able to apply these concepts to the design and construction of devices;
6. compare and contrast the functional characteristics of prosthetic components;
7. formulate appropriate prosthetic prescriptions for wide range clinical situations; and
8. appreciate and describe the roles of key members of the rehabilitation team and identify how they interrelate with the prosthetist.

POT 307: Lower Limb Prosthetics I

(2 Units C: LH 30)

Course Contents

Prosthetic laboratory and its layout; description of the layout of a prosthetic laboratory. Sketch of a prosthetic laboratory layout; functions of each part of the prosthetic laboratory. Various tools used in the fabrication of prostheses. Machinery used in the fabrication of prostheses. Functions of tools and machines used in the fabrication process of prostheses. Tools and machines used in a prosthetic workshop; sketch some of the hand tools used in prosthetics laboratory. Ankle and partial foot prosthesis, functions of an ankle and partial foot prosthesis. Component parts of an ankle and partial foot prosthesis; measurements of ankle and partial foot amputee; casts of ankle and partial foot amputee. Fabricating ankle and partial foot prostheses; identification of faults on an ankle and partial foot. Identifying a transtibial prosthesis; functions of transtibial prosthesis. Component parts of such prosthesis. Measurement of a transtibial amputee; cast of amputee. Fabrication of transtibial prosthesis; faults on prosthesis such as socket or foot breakage.



POT 308: Lower Limb Prosthetics II

(2 Units C: LH 30)

Course Contents

Knee disarticulation prosthesis; functions of knee disarticulation prosthesis; component parts of a knee disarticulation prosthesis; measurements of a knee disarticulation amputee; cast of a knee disarticulation amputee; fabrication of component of the knee disarticulation prosthesis of the foot, knee & socket using appropriate materials; identification of faults on knee disarticulation prosthesis such as joint breakage; damage to the socket and many others. Identification of a trans-femoral prosthesis; functions of a trans- femoral prosthesis; component parts of a trans-femoral prosthesis; measurements of a trans-femoral amputee; cast of a trans-femoral amputee; fabrication of socket, knee and foot of a trans-femoral prosthesis using appropriate materials; faults on a trans-femoral prosthesis such as socket breakage, joint breakage, damage, foot breakage and many others. Hip disarticulation prosthesis; functions of a hip disarticulation prosthesis; component parts of hip disarticulation prosthesis; measurements of a hip disarticulation amputee; cast of a hip disarticulation amputee; fabrication the components of the hip disarticulation prosthesis-socket from resins; faults on hip disarticulation prosthesis such as socket breakage, joint breakage, damage, foot breakage and many others.

POT 311: Upper Limb Prosthetics

(2 Units C: LH 30)

Course Contents

Prosthetic laboratory and layout. Functions of each aspect of the laboratory. Tools and machines used in the fabrication of upper limb prostheses; functions of various tools, machines and materials used in fabrication of upper limb prosthesis; machines and materials used in upper limb prostheses. Wrist disarticulation prosthesis; functions and component parts of wrist disarticulation prosthesis; measurements, fabrication and cast of a wrist disarticulation amputee; faults prosthesis such as broken socket, malfunctioning hand. Trans-radial prostheses and functions of Trans – radial Prostheses; measurement, fabrication, cast and component parts of a Trans – Radial Prostheses; faults in Trans- radial prostheses. functions and Trans – humeral prostheses; measurement, cast, fabrication and component parts of a Trans – humeral prostheses; faults in Trans - humeral prosthesis.

(POT 309, POT 310) Plaster casting courses

Learning Outcomes

At the conclusion of the courses, the student should be able to:

1. identify casting material and different types of casting like traction embedded in plaster cast;
2. list indications for plaster and be able to make and also identify different types of body;
3. identify jackets such as: Modified Minerva body jacket, Full minerva body jacket, Halo-pelvic a body jacket;
4. identify and explain the chemical components of synthetic plaster bandage;
5. differentiate between plaster of paris and synthetic plaster bandage;
6. demonstrate the application of synthetic bandage to make a plaster cast;
7. identify the materials used to make the plaster casts of the lower extremities;
8. making of the following plaster cads of the lower extremities of the human being; boot plaster cast, below knee cast, Above Knee cast, High above Knee cast cylinder cast; and
9. counsel patients after plaster cast application and many others.



POT 309: Plaster Casting Technique I

(3 Units C: LH 30; PH 45)

Course Contents

Definition of plaster of Paris. Historical development of plaster of Paris and plaster casting. Relevance of orthopaedic plaster in the management of bone fractures. Roles of plaster expert in the management of orthopaedic and trauma conditions. Chemical composition of plaster of Paris; physical characteristics of plaster of Paris; uses of plaster of Paris. Building facility structure, ventilation, illumination, entry and exit routes of a typical plaster room; human resources needed in the plaster casting room; materials needed in the plaster room such as furniture, equipment instrument and many others; financial resources and budgeting for an ideal plaster room; system of management of the plaster room; equipment and instrument needed in the plaster room such as Plaster cutter/shears, Plaster bender, Plaster scissors. Use of each equipment/instrument listed in above. Different types of plaster cast application such as Colles' cast, scaphoid cast and many others. Methods of plaster cast making. Complications associated with use of plaster such as swelling compression, damage to blood vessels, damage to nerves; process for dealing with the complications of plaster; care of patient in plaster cast. Procedure of removal of plaster cast; instruments for plaster cast removal. Reasons for removal of plaster cast; possible complications associated with the removal of plaster cast; possible hazards that may arise in the plaster room such as electrical wiring, slippery floor; protective wears for plaster room work. Safety precaution to hazards. Other materials that can be used for casting; different types of synthetic casts; advantages and disadvantages of synthetic casts over plaster of Paris; chemical composition of synthetic cast and moulding of synthetic casts. Different types of lifts for lifting and handling of patient in plaster. Mechanism of muscle contraction; terms – posture gravity and balance. Difference between lifting and dragging. Different methods of lifting and their techniques; different positions used in lifting; lift and handling patients in plaster cast. Different parts of upper extremities of human being slab plaster casts used for the management of bone fractures of upper extremities of human. Materials used in making slab of casts; making the following slab casts: below elbow back, above elbow back slab, cock up splint, anterior slab; different parts of the lower extremities; different slab plaster casts used for the management of bone fractures of the lower extremities. plaster bandages and padding materials used in plaster casting. process of making removable and non – removable below knee slab plaster cast. make removable and non removable slab casts. Counseling patient after applying slab cast.

POT 310: Plaster Casting Techniques II

(3 Units C: LH 30; PH 45)

Course Contents

Different parts that make up the upper extremities of human being. Plaster casts used for the management of bone fractures of upper extremities such as Colle's plaster cast, Scaphoid plaster cast, Bennet plaster cast, below elbow cast, Hanging cast U' cast. Different parts of the lower extremities of the human being. Plaster casts used for the management of bone fractures of the lower extremities of human. Materials used to make the plaster casts of the lower extremities. making of the following plaster casts of the lower extremities of the human being; Boot plaster cast, below knee cast, Above Knee cast, High above Knee cast cylinder cast, Counsel patients after plaster cast application. Wedging and need for wedging a dry cast; materials used for wedging of a cast. Supportive devices in plaster casting; materials used in making the supportive devices such as heel raising wooden, block for weight bearing leg plaster cast, walking stick, pairs of crutches, collar & cuff bandage; function/ uses of the supportive device; maintain supportive



devices; identify complications that may arise from the use of supportive devices listed in above. Technique of wedging of plaster casts; wedge plaster casts; define synthetic plaster bandage. identify the synthetic plaster. identify the tools used in synthetic plaster cast; chemical components of synthetic plaster bandage. Difference between plaster of paris and synthetic plaster bandage. Application of synthetic bandage to make a plaster cast; moulding a synthetic plaster on a limb. Cast bracing; purposes of cast bracing. Different metal braces used in cast bracing. Making of braces: femoral cast bracing, tibial cast bracing. Spica; different types of spica such as: Shoulder spica, Single (unilateral) hip spica, Double (bilateral) hip spica, One and a half hip spica; different types of spica. Apply plaster spica to patients; counseling patient in plaster spica. Different parts of human body trunk. Body jacket cast; different types of body jackets such as: Modified Minerva body jacket, Full minerva body jacket, Halo-pelvic body jacket; uses of body jackets; making different body jackets. Counseling patients in body jackets. Sarmiento plaster cast; uses of sarmiento cast; materials used in making sarmiento cast; procedure of making a sarmiento cast. counsel patients and clients on sarmiento cast. describe frog cast. Indications for frog cast; materials required for making frog cast. Parts of human hand. Volar Slab Cock-up splint and their uses; difference between Volar Slab and Cock-up Slab (Splint); materials used for: Volar slab, Cock up splint, Make – Volar slab and Cock up splint. Materials required in making traction embedded in plaster cast; process of making traction embedded in plaster cast; application of traction embedded in plaster cast. Plaster bed. Indications for plaster. Materials required for making plaster bed.

POT 317: Clinical Pathology

(2 Units C: LH 30)

Learning Outcomes

At the end of this course, the students should be able to:

1. discuss cellular mechanism and basis of diseases;
2. identify different inflammatory molecules and the mechanism of immune response to foreign biological and non-biological entities;
3. discuss types of injury, bacteria, fungal and viral diseases, oedema and thrombosis conditions; and
4. describe types of tumours /cancers.

Course Contents

Pathology of diseases. Cellular basis of disease. Inflammation and healing. Immune mechanism, physical agents in injury and disease, drug and chemical injury, radiation injury, atrophy, hypertrophy, degeneration, oedema, thrombosis, infarction, bacterial and viral disease, fungal infections, tumours, cancers and inherited disease.



POT 401 Computer Aided Design of Assistive Devices**(2 Units C: LH 15; PH 45)****Learning Outcomes**

At the end of this course, students should be able to:

1. appreciate and describe the design of modern Prosthetics & Orthotics products with computer aids; and
2. state the use of special software packages to produce quality and competitive products, Special printers especially 3 D types are usually employed.

Course Contents

Computer-Aided Design (CAD). CAD Hardware and Software; The Drawing Tools; Design management; Introduction to 3-D Design, 3 D Modeling; The printing and plotting process. Design of Prosthetics and Orthotics and other Biomedical products.

POT 411: Research Methodology**(2 Units C: LH 30)****Learning Outcomes**

At the end of this course, students should be able to:

1. discuss the concept of research and benefits;
2. describe the types of research;
3. discuss the steps in research;
4. initiate, conduct and present a research project; and
5. use biostatistics, research design and research reporting as aid to quality research in the final year.

Course Contents

Types and Nature of Research. Writing Research Proposal. Format for Seminars Presentation Research Problems, & Research Design, Data Collection & Storage, Referencing Styles. Population and Samples. Hypothesis & Hypotheses testing. Reporting Results of Clinical Research. Presentation & Interpretation of Clinical Research.

POT 413: Dissertation Seminar**(2 Units C: LH 30)****Learning Outcomes**

At the end of this course, the students should be able to:

1. engage in scientific writing and research;
2. express confidence addressing scientific audience on a well-articulated topic or research report; and
3. use audiovisual aid to present research report or seminar relevant Prosthetics and Orthotics.

Course Contents

Presentation of a paper by each student on an approved topic at a Departmental colloquium.



POT 415: Therapeutic Exercises and Assistive Devices

(2 Units C: LH 30)

Learning Outcomes

At the end of this course, the students should be able to:

1. conduct different types of therapeutic exercises;
2. conduct and put patients fitted with prosthesis and orthosis through learning process and controlled exercises; and
3. appreciate and recognise therapeutic exercises, patho and biomechanics as key to returning the patient back to normalcy or near normalcy.

Course Contents

Exercise for the treatment of specific types of disease conditions. Group therapy, suspension therapy, traction, breathing exercises, relaxation techniques, facilitated movement, neuromuscular coordination exercise, health promotion, principles of exercise prescription. Lower motor neuron lesions, amputees, arthritis, back pain, pulmonary diseases, hemiplegia and paraplegia. Learning process with Prosthetics and Orthotics products, adaptations to assistive products and many others.

POT 419 Introduction to Robotics

(2 Units C: LH 30)

Learning Outcomes

At the end of this course, the students should be able to:

1. appreciate the use of electronics in Prostheses like myoelectric Prostheses which has given rise to robotic Prostheses i.e., robotic arms. This is a recent development in modern prostheses production;
2. state the work of biosensors and how to apply them; and
3. appreciate the scope and how biosensors has enabled the rapid development of automation and robotic prostheses such as Boston Digital Arm.

Course Contents

Automation and Robotics. Robot Classification. Robot Specifications. Direct Kinematics: D-H representation. The Arm equation. Examples Inverse Kinematics: The inverse kinematics problem and its solution. Tool configuration. Examples of various robots. Introduction to Manipulator Dynamics: Lagrange's Equation, Lagrange-Euler Dynamic Model. Use of Sensors and Vision System in Robotic System. Biosensors, Controllers, Actuators, Powered exoskeleton and many others.

POT 420: Orthopaedic Pathology I

(2 Units C: LH 30)

Learning Outcomes

At the end of the course, the students should be able to:

1. state types of congenital Orthopedic diseases/deformities;
2. enumerate types of acquired Orthopaedic diseases/deformities;
3. explain different metabolic diseases that can lead to orthopedic conditions and deformities;
4. recognise and describe the signs and symptoms of the most common pathologies which require prosthetic solutions including, aetiology, clinical presentation, prognosis and appropriate device management;
5. define different orthopaedic conditions;



6. state the classification of orthopaedic conditions; congenital and acquired types;
7. list the causes of orthopaedic conditions under each classification: Congenital & Acquired;
8. define congenital deformities;
9. identify congenital deformities;
10. describe the various types of congenital deformities;
11. state the problems associated with congenital deformities;
12. define acquired deformities;
13. identify types of deformities;
14. describe the various types of acquired deformities;
15. state the problems associated with acquired deformities and materials needed for the treatment of orthopaedic pathological conditions;

500 Level Courses

POT 501 Prosthetics and Orthotics Business and Profitability (2 Units C: LH 30)

Learning Outcomes

At the end of this course, the students should be able to:

1. explain the current trend as to produce graduates who will be independent and self-employed;
2. recognise business sustainable rules and principles;
3. recognise rules and sources of credit facilities; and
4. identify skills that will help them to become entrepreneurs that will help to reduce unemployment and drive our economy.

Course Contents

Prostheses and Orthoses production, management and profit returns. Raw materials and component supply chain management and marketing of finished products. The economics of assistive devices production and planning, marketing management and many others. Different credit facilities and sources available for small and medium scale businesses in Nigeria, tax regimes and strategies and many others. factors to consider in setting up Prosthetics and Orthotics facilities. The need to look beyond local markets and competitive products production and wealth creation.

POT 503: Orthopaedic II (2 Units C: LH 30)

Learning Outcomes

At the of this course, student should be able to:

1. recognise orthopaedic / pathologic conditions that will lead to deformities like TB of spine, scoliosis, spondylosis;
2. explain and appreciate the etiology and clinical manifestations of different orthopaedic diseases; and
3. identify prosthetics and orthotics products for use against the different deformities emanating from pathologic conditions.



Course Contents

Identification of orthopaedic conditions affecting the Spine e. g. TB of the spine, prolapsed disc, lordosis, scoliosis, kyphosis, spondylosis, spondylolithesis. Aetiology and clinical manifestations of the Orthopaedic conditions. Materials necessary for the treatment of each of the following condition; plaster casts, collars, and corsets. Production of materials necessary for the treatment of spinal orthopaedic conditions. Orthopaedic conditions affecting the joints such as osteoarthritis, septic arthritis, inflammatory arthritis, angular deformities, genuvarum & genuvalgum; description of the aetiology and clinical manifestations of the orthopaedic conditions listed above. Orthopaedic conditions resulting from metabolic disorders; such as rickets, osteoporosis, osteomalacia, pagets disease and materials necessary for the treatment of each conditions.

POT 507: Biomechanics II

(2 Units C: LH 30; PH 45)

Learning Outcomes

At the end of the courses, the student should be able to:

1. demonstrate an ability to apply principles of tissue mechanics to explain the principles of P&O treatment, (involving various force systems) and the practical problems encountered in prosthetics and orthotics;
2. use biomechanical terminology to describe position and motion of the human body;
3. discuss mechanical principles governing human motion;
4. utilise temporospatial, kinematic and kinetic information to distinguish between normal and abnormal function of the upper limbs, lower limbs & Spine;
5. analyse the forces at a skeletal joint for various static and dynamic activities;
6. demonstrate the ability to analyse forces and moments applied to the body by prosthetic and orthotic devices;
7. apply biomechanical principles to generate optimal solutions to clinical problems in prosthetics and orthotics; and
8. appreciate the concepts of differentiation and integration, evaluate derivatives and integrals of a function.

Course Contents

Description of different types of amputation. Stump and socket design. Different types of stump in Patients; magnitude of pressure between stump and socket; typical stump/socket pressure. importance of the shape of the Socket to the stump pressure distribution. Bench alignment procedures in prosthesis; component required for alignment. Procedures in prosthesis such as knee component, foot component, socket component insert. Assemble the component identified. Explanation of term "static (standing) alignment" and dynamic (walking) alignment.

Demonstration of the bench alignment, static alignment and dynamic alignment on patients. Pathological gait and pattern in a patient such as dipping gait, lateral trunk, bending, vaulting and many others; the causes of the pathological gaits; Orthotic devices for the treatment of each of the patterns in the pathological gait. Orthosis and major types; functions and hazards of orthosis; functions of the following orthotic devices; ankle foot orthosis, knee-ankle foot orthosis, Hip-knee-ankle foot orthosis, orthopaedic shoes, and assistive locomotive aid. Definition of the following: bench alignment, dynamic alignment, static alignment with effect on muscle action of human body. The Law of inert a, momentum and its application to normal- human locomotion. Use of the functional terminal devices in upper limb prosthesis and orthosis. Description of body alignment to prosthetic and orthotic fitting. Definition of normal gait; pathological gait; phases of gait cycle; types of gait cycle; gait deviations; qualitative and quantitative gait variables; different



gaits patterns associated with lower limb amputees; ways normal gait can be achieved in patients with lower limb amputees.

POT 506: General Prosthesis and Orthosis Practice

(3 Units C: LH 15; PH 90)

Learning Outcomes

At the end of the course, student should be able to:

1. prepare mould with plaster of paris for trans tibiaal, trans femoral, trans radial and trans humeral amputees;
2. asses a patient and prescribe the right prostheses;
3. modify moulds to measurement;
4. assemble the component parts of prostheses;
5. appreciate clinical provision of prostheses and orthoses;
6. manufacture of prostheses and orthoses;
7. cover moulds with laminates;
8. fit prostheses on patient after observation of patients' gait and correction;
9. measure and cut out thermoplastic sheet for quad and PLS; and
10. educate the patient on prosthetic orthotics care.

Course Contents

Measurement and casting of a transtibial amputee using plaster of paris and measuring tape; Measurement and casting of trans femoral, trans radial and trans humeral amputees. Preparation of a positive mould using plaster and paris (P.O.P.) powder; Modification of moulds to measurements; covering the mould above with laminates i.e. P.V.A sleeve, stockinette, fibre glass, resin and reagents. Allowing the socket above to cure; cutting out and trimming the socket; assembling of the component parts of prostheses i.e. socket, ankle block and foot; bench alignment of component parts of prostheses and bond; fitting of the patient statically i.e. without moving; carrying out dynamic alignment on the prostheses. Observing patient's gait and making corrections where necessary after fitting with prostheses; Finishing the prosthesis by shaping and lamination. Checking that the patient's prosthesis is as prescribed; making the patient ambulate with the prosthesis; educating the patient on prosthetic care – cleaning, routine appointment and limitations.

Orthosis practice – assessment, measuring and casting a patient with lower foot deformities; assessing, measuring and casting a prosthesis for paraplegic, polio aid; preparing a positive mould using plaster of Paris powder; modification of the mould to measurement; measuring and cutting out thermoplastic sheets for quad and PLS, put sheets in oven at appropriate temperature, apply sheets on prothetic mould, allow to cool, then trim; assembling the component parts of orthoses i.e. the plastic mould, laminate side bars, knee pads and straps.

Bench alignment of the component parts, check alignment of orthoses of joints, carrying out static fitting of the patient; carry out dynamic alignment and fitting on the patient; observing patients gait and make corrections where necessary; finish the orthoses by riveting; checking that orthotic device is as prescribed. Making the patient ambulate to achieve optimal gait with the orthoses. Counsel the patient on the use and care of the orthotic device – cleaning routine appointment and limitation.



Learning Outcomes

At the end of the course, the students should be able to:

1. conduct scientific and focused research;
2. write articles for publication;
3. make use of statistics and statistical packages; and
4. source, articulate and review literatures.

Course Contents

The dissertation is a unique opportunity for students to carry out hypothesis-driven research in different areas of the programme under the supervision of academic staff. Oral presentations of the project are required (internal and external defence).

Minimum Academic Standards**Equipment**

for Prosthetics and Orthotics (BSc) programme

Plaster of Paris – Powdery $\text{CaO} + \text{H}_2\text{O}$.

Steel – hard vest, tough.

Wood – wood in prosthetics such as Artificial limb, SACH foot, Knee piece.

Aluminium and many other makeable.

Adhesives and elastic.

Leather - leather in prosthetics and orthotics, such as ring padding, knee pad, cuff suspension, orthopaedic shoes and many others.

Plastic – plastics in prosthetics and orthotics; such as KAFO, AFO, SPLINTS and many others.

Vice to hold materials.

Hard saw to cut.

Guillotine machine to cut.

Sheer machine to cut.

Grinding stones/machine.

Welding machine.

Vacuum machine.

Suction machine.

Hot Air Oven.

Drill press m/c.

Lathe machine.

Craftsman carver.

Skiving machine.

Industrial sewing machines.

Router machine.

Staffing

Teaching staff: There shall be a minimum of six teaching staff, in which there shall be a minimum of one staff on Professorial rank, one senior lecturer and four others before the programme will commence.



Teaching staff students' ratio:

There shall be a ratio of one (1) teaching staff to fifteen (15) students.

None teaching staff students' ratio:

There shall be a ratio of one (1) non-teaching staff to thirty (30) students.

Library

There shall be core current text books and other related and support text books in the library (hard and soft copies).

There shall be ratio of one (1) computer to fifteen (15) students with seats.

There shall be internet services

There shall be current Journals hard and soft copies

Laboratory

There shall be three laboratories namely:

1. prostheses laboratory;
2. orthoses laboratory; and
3. Plaster laboratory.

Classrooms, laboratories and office spaces

Classroom

The standard requirement of 0.65m² per full-time student should be maintained. Thus the minimum total space requirement for a faculty or department shall be the product of its total full time equivalent student enrolment (FTE) and the minimum space requirement per full-time equivalent i.e. (FTE) 0.65m².

Office

In this respect, each academic staff should have an office space of at least 25 square metres taking into cognisance the status/cadre of the staff

In addition, there should be for the Faculty, a Dean's office and for each Department a Head of Department's office with attached offices for their supporting staff as specified below in m²:

| | | |
|----------------------------------|---|-------|
| Professor's office | - | 18.50 |
| Head of Department's office | - | 18.50 |
| Tutorial teaching staff's office | - | 13.50 |
| Other teaching staff space | - | 7.00 |
| Technical staff space | - | 7.00 |
| Secretarial space | - | 7.00 |
| Staff research laboratory | - | 16.50 |
| Seminar Space/per student | - | 1.85 |
| Laboratory space (per student) | - | 7.50 |



B.Sc. Public Health

Overview

The programme is to produce competent graduates that can serve as public health professionals in the country and globally by mastering the art and science of preventing diseases, protecting, and improving the health of communities and the population at large through research, promoting healthy lifestyle and surveillance to prevent infections and injuries while working in a team or as an individual. The degree is to be a four-year course and called Bachelor of Science in Public Health (BSc. Public Health).

Philosophy

The philosophy of the public health programme is to provide a broad-based academic, professional training and competence that reflect the emphasis on the current national preventive health care system and services.

Objectives

The objectives of the programme are to:

1. enable students acquire competences in public health, carry out community diagnosis, immunisation, community mobilisation, health education and apply statistical and mathematical methods to the design and analysis of public health problems;
2. enable students conduct biomedical research, nutrition and growth monitoring, environmental monitoring, and disease surveillance; and
3. prepare public health professionals to take up effective leadership and management position in the community, workplaces, school settings and health centres and health care institutions.

Unique Features of the Programme

There are certain features which are unique to the revised programme, they are as follows:

1. a total of seven (7) foundation courses and some core courses are similar with what is obtainable at Johns Hopkins University, which is ranked second in Public Health in the world;
2. the programme is that there are two (2) no's of community health practicum the students are going to attend, and a report will be presented in form of seminar and written for assessment;
3. the students will be exposed to community health issues in accordance with various global socio-cultural settings; and
4. the curriculum is structured in line with what is obtained in other Universities globally.

Employability Skills

At the end of the programme, graduates should be able to:

1. develop a research question and formulate a research hypothesis that can lead to finding a solution to health problem;
2. conduct relevant literature search and review in their place of work whenever the need arises while conducting research ethically and behaving in a responsible manner and can summarise and present research findings;
3. collect, clean, analyse and present data in such a way that it can be meaningful to an Intelligent Non-Expert (INE) as such can be employed by any research institution; and
4. learn to work under minimal or no supervision and within datelines.



21st Century Skills

1. Collaboration and team work
2. Creativity and imagination
3. Critical thinking
4. Problem solving
5. Flexibility and adaptability
6. Information Literacy
7. Leadership
8. Civic literacy and citizenship
9. Social responsibility
10. Technology literacy
11. Initiative.

Admission and Graduation Requirements

Admission Requirements

Four-Year Degree Programme

Candidates seeking admission into the programme must have at least five credit passes at the Senior Secondary School Certificate (SSCE/NECO/GCE) examinations in English Language, Mathematics, Biology or Health Science, Chemistry, Physics, or any other Science subject.

Direct Entry

For Direct Entry, candidates with National Diploma in Science Laboratory Technology, Diploma in Medical Laboratory Science, Diploma Dental Technology, Community Health Extension Workers, and other candidates such as Registered Nurses and Registered Midwives.

Five SSSC (or equivalent) credit passes in relevant subjects, two of which are at the Advanced Level.

Graduation Requirements

To be eligible for the award of the B.Sc. (Hons.) Degree in Public Health, the student must have completed and passed the prescribed courses totalling 120 credit units minimum for students that entered the programme through UTME and a minimum of 90 credit units for Direct Entry level students.



Global Course Structure

100 level

| Course Code | Course Title | Unit(s) | Status | LH | PH |
|--------------|----------------------------------|-----------|--------|----|----|
| GST 111 | Communication in English | 2 | C | 15 | 45 |
| GST 112 | Nigerian Peoples and Culture | 2 | C | 30 | - |
| BIO 101 | General Biology I | 2 | C | 30 | - |
| BIO 102 | General Biology II | 2 | C | 30 | - |
| BIO 107 | General Biology Practical I | 1 | C | - | 45 |
| BIO 108 | General Biology Practical II | 1 | C | - | 45 |
| CHM 101 | General Chemistry I | 2 | C | 30 | - |
| CHM 102 | General Chemistry II | 2 | C | 30 | - |
| CHM 107 | General Chemistry Practical I | 1 | C | - | 45 |
| CHM 108 | General Chemistry Practical II | 1 | C | - | 45 |
| MTH 101 | Elementary Mathematics I | 2 | C | 30 | - |
| COS 101 | Introduction to Computer Science | 3 | C | 30 | 45 |
| PHY 101 | General Physics I | 2 | C | 30 | - |
| PHY 102 | General Physics II | 2 | C | 30 | - |
| PHY 107 | General Physics Practical I | 1 | C | - | 45 |
| PHY 108 | General Physics Practical II | 1 | C | - | 45 |
| Total | | 27 | | | |

C = Compulsory; LH = Lecture Hours; PH = Practical Hours

200 Level

| Course Code | Course Title | Unit(s) | Status | LH | PH |
|-------------|--|-----------|--------|----|----|
| ENT 211 | Entrepreneurship and Innovation | 2 | C | 30 | - |
| GST 212 | Philosophy, Logic and Human Existence | 2 | C | 30 | - |
| MCB 201 | General Microbiology | 2 | C | 15 | 45 |
| ANA 201 | Anatomy of Upper & Lower Limbs | 2 | C | 15 | 45 |
| BCH 201 | General Biochemistry | 2 | C | 30 | - |
| PIO 201 | Introductory Physiology and Blood | 2 | C | 30 | - |
| PHS 201 | Introduction to Public Health | 2 | C | 30 | - |
| PHS 202 | Biostatistics | 2 | C | 30 | - |
| PHS 203 | Principles of Epidemiology (infectious disease epidemiology and Immunisation techniques) | 2 | C | 30 | - |
| PHS 204 | Demography and Social Statistics in Public Health | 2 | C | 30 | - |
| | Total | 23 | | | |



300 level

| Course Code | Course Title | Unit(s) | Status | LH | PH |
|--------------------|--|----------------|---------------|-----------|-----------|
| GST 312 | Peace and Conflict Resolution | 2 | C | 30 | - |
| ENT 312 | Venture Creation | 2 | C | 15 | 45 |
| PHS 301 | Public Health Microbiology and Parasitology/Entomology | 2 | C | 15 | 45 |
| PHS 302 | Health Programme Planning and Evaluation | 2 | C | 30 | - |
| PHS 304 | Occupational Health and Disaster Management | 2 | C | 30 | - |
| PHS 303 | Environmental Health and Public Health Laws | 2 | C | 30 | - |
| PHS 305 | Family and Reproductive Health | 1 | C | 15 | - |
| PHS 306 | Community Health Practicum I | 2 | C | - | 90 |
| PHS 308 | Public Health Nutrition | 1 | C | 15 | - |
| | Total | 16 | | | - |

400 Level

| Course Code | Course Title | Unit(s) | Status | LH | PH |
|--------------------|---|----------------|---------------|-----------|-----------|
| PHS 401 | Health Policy and Finance | 2 | C | 30 | - |
| PHS 402 | Health System Planning, Management and Administration | 2 | C | 30 | - |
| PHS 403 | Health Sociology | 2 | C | 30 | - |
| PHS 405 | Community Health Care Practicum II | 2 | C | - | 90 |
| PHS 407 | Epidemiology, Disease Control & Surveillance | 2 | C | 30 | - |
| PHS 409 | International and Global Health | 2 | C | 30 | - |
| PHS 411 | Principles of Pharmacology, Therapeutics, and Substance Abuse | 2 | C | 30 | - |
| PHS 400 | Research Project | 3 | C | - | - |
| | Total | 17 | | | |



Course Contents and Learning Outcomes

GST 111: Communication in English

(2 Units C: LH 15; PH 45)

Learning Outcomes

At the end of this course, students should be able to:

1. identify possible sound patterns in English Language;
2. list notable Language skills;
3. classify word formation processes;
4. construct simple and fairly complex sentences in English;
5. apply logical and critical reasoning skills for meaningful presentations;
6. demonstrate an appreciable level of the art of public speaking and listening; and
7. write simple and technical reports.

Course Contents

Sound patterns in English Language (vowels and consonants, phonetics and phonology). English word classes (lexical and grammatical words, definitions, forms, functions, usages, collocations). Sentence in English (types: structural and functional, simple and complex). Grammar and Usage (tense, mood, modality and concord, aspects of language use in everyday life). Logical and Critical Thinking and Reasoning Methods (Logic and Syllogism, Inductive and Deductive Argument and Reasoning Methods, Analogy, Generalisation and Explanations). Ethical considerations, Copyright Rules and Infringements. Writing Activities: (Pre-writing , Writing, Post writing, Editing and Proofreading; Brainstorming, outlining, Paragraphing, Types of writing, Summary, Essays, Letter, Curriculum Vitae, Report writing, Note making and many others. Mechanics of writing). Comprehension Strategies: (Reading and types of Reading, Comprehension Skills, 3RsQ). Information and Communication Technology in modern Language Learning. Language skills for effective communication. Major word formation processes. Writing and reading comprehension strategies. Logical and critical reasoning for meaningful presentations. Art of public speaking and listening.

GST 112: Nigerian Peoples and Culture

(2 Units C: LH 30)

Learning Outcomes

At the end of the course, students should be able to:

1. analyse the historical foundation of the Nigerian culture and arts in pre-colonial times;
2. list and identify the major linguistic groups in Nigeria;
3. explain the gradual evolution of Nigeria as a political unit;
4. analyse the concepts of Trade, Economic and Self-reliance status of the Nigerian peoples towards national development;
5. enumerate the challenges of the Nigerian State towards Nation building;
6. analyse the role of the Judiciary in upholding people's fundamental rights;
7. identify acceptable norms and values of the major ethnic groups in Nigeria; and
8. list and suggest possible solutions to identifiable Nigerian environmental, moral and value problems.



Course Contents

Nigerian history, culture and art up to 1800 (Yoruba, Hausa and Igbo peoples and culture; peoples and culture of the ethnic minority groups). Nigeria under colonial rule (advent of colonial rule in Nigeria; Colonial administration of Nigeria). Evolution of Nigeria as a political unit (amalgamation of Nigeria in 1914; formation of political parties in Nigeria; Nationalist movement and struggle for independence). Nigeria and challenges of nation building (military intervention in Nigerian politics; Nigerian Civil War). Concept of trade and economics of self-reliance (indigenous trade and market system; indigenous apprenticeship system among Nigeria people; trade, skill acquisition and self-reliance). Social justices and national development (law definition and classification. Judiciary and fundamental rights. Individual, norms and values (basic Nigeria norms and values, patterns of citizenship acquisition; citizenship and civic responsibilities; indigenous languages, usage and development; negative attitudes and conducts. Cultism, kidnapping and other related social vices). Re-orientation, moral and national values (The 3R's – Reconstruction, Rehabilitation and Re-orientation; Re-orientation Strategies: Operation Feed the Nation (OFN), Green Revolution, Austerity Measures, War Against Indiscipline (WAI), War Against Indiscipline and Corruption (WAIC), Mass Mobilization for Self-Reliance, Social Justice and Economic Recovery (MAMSER), National Orientation Agency (NOA). Current socio-political and cultural developments in Nigeria.

BIO 101: General Principles of Biology

(2 Units C: LH 30)

Learning Outcomes

At the end of lectures in Plant Biology, students should be able to:

1. explain cells structure and organisations;
2. summarise functions of cellular organelles;
3. characterise living organisms and state their general reproduction;
4. describe the interrelationship that exists between organisms;
5. discuss the concept of heredity and evolution; and
6. enumerate habitat types and their characteristics.

Course Contents

Cell structure and organisation. functions of cellular organelles. characteristics and classification of living things. chromosomes, genes their relationships and importance. General reproduction. Interrelationships of organisms (competitions, parasitism, predation, symbiosis, commensalisms, mutualism, saprophytism). Heredity and evolution (introduction to Darwinism and Lamarckism, Mendelian laws, explanation of key genetic terms). Elements of ecology and types of habitat.

BIO: 102 General Principles of Biology II

(2 Units C: LH 30)

Learning Outcomes

At the end of the lectures in Introductory Ecology, students should be able to:

1. List the characteristics, methods of identification and classification of viruses, bacteria and fungi;
2. state the unique characteristics of plant and animal kingdoms;
3. describe ecological adaptations in the plant and animal kingdoms;
4. explain nutrition, respiration, excretion and reproduction in plants and animals; and
5. describe growth and development in plants and animals.



Course Contents

Basic characteristics, identification and classification of viruses, bacteria and fungi. A generalised survey of the plant and animal kingdoms based mainly on the study of similarities and differences in the external features. Ecological adaptations. Briefs on physiology to include nutrition, respiration, circulatory systems, excretion, reproduction, growth and development.

CHM 101: General Chemistry I

(2 Units C: LH 30)

Learning Outcomes

At the end of this course, students should be able to:

1. define atom, molecules and chemical reactions;
2. discuss the Modern electronic theory of atoms;
3. write electronic configurations of elements on the periodic table;
4. justify the trends of atomic radii, ionization energies, electronegativity of the elements based on their position in the periodic table;
5. identify and balance oxidation – reduction equation and solve redox titration problems;
6. illustrate shapes of simple molecules and hybridised orbitals;
7. identify the characteristics of acids, bases and salts, and solve problems based on their quantitative relationship;
8. apply the principles of equilibrium to aqueous systems using LeChatelier's principle to predict the effect of concentration, pressure and temperature changes on equilibrium mixtures;
9. analyse and perform calculations with the thermodynamic functions, enthalpy, entropy and free energy; and
10. determine rates of reactions and its dependence on concentration, time and temperature.

Course Contents

Atoms, molecules and chemical reaction. Chemical equation and stoichiometry. Atomic structure and periodicity. Modern electronic theory of atoms. Radioactivity. Chemical bonding. Properties of gases. Equilibria and Thermodynamics. Chemical Kinetic. Electrochemistry.

CHM 102: General Chemistry II

(2 Units C: LH 30)

Learning Outcomes

At the end of this course, students should be able to:

1. state the importance and development of organic chemistry;
2. define fullerenes and its applications;
3. discuss electronic theory;
4. determine the qualitative and quantitative of structures in organic chemistry;
5. describe rules guiding nomenclature and functional group classes of organic chemistry;
6. determine rate of reaction to predict mechanisms of reaction;
7. identify classes of organic functional group with brief description of their chemistry;
8. discuss comparative chemistry of group 1A, IIA and IVA elements; and
9. describe basic properties of Transition metals.



Course Contents

Historical survey of the development and importance of Organic Chemistry. Fullerenes as fourth allotrope of carbon, uses as nanotubules, nanostructures, nanochemistry. Electronic theory in organic chemistry. Isolation and purification of organic compounds. Determination of structures of organic compounds including qualitative and quantitative analysis in organic chemistry. Nomenclature and functional group classes of organic compounds. Introductory reaction mechanism and kinetics. Stereochemistry. The chemistry of alkanes, alkenes, alkynes, alcohols, ethers, amines, alkyl halides, nitriles, aldehydes, ketones, carboxylic acids and derivatives. The Chemistry of selected metals and non-metals. Comparative chemistry of group IA, IIA and IVA elements. Introduction to transition metal chemistry.

CHM107: Practical Chemistry I

(1 Unit C: PH 45)

Learning Outcomes

At the end of the course, students should be able to:

1. describe the general laboratory rules and safety procedures;
2. collect scientific data and correctly carrying out Chemical experiments;
3. identify the basic glassware and equipment in the laboratory;
4. identify the differences between primary and secondary standards;
5. perform redox titration;
6. recording observations and measurements in the laboratory notebooks; and
7. analyse the data to arrive at scientific conclusions.

Course Contents

Laboratory experiments designed to reflect topics presented in courses CHM 101 and CHM 102. These include acid-base titrations, qualitative analysis, redox reactions, gravimetric analysis, data analysis and presentation.

CHM 108: General Chemistry Practical II

(1 Unit C: PH 45)

Learning Outcomes

At the end of this course, the students should be able to:

1. identify the general laboratory rules and safety procedures;
2. collect scientific data and correctly carrying out Chemical experiments;
3. identify the basic glassware and equipment in the laboratory;
4. identify and carry out preliminary tests which includes ignition, boiling point, melting point, test on known and unknown organic compounds;
5. perform solubility tests on known and unknown organic compounds;
6. conduct elemental tests on known and unknown compounds; and
7. conduct functional group/confirmatory test on known and unknown compounds which could be acidic / basic / neutral organic compounds.

Course Contents

Continuation of CHM 107. Additional laboratory experiments to include functional group analysis, quantitative analysis using volumetric methods.



MTH 101: Elementary Mathematics (Algebra and Trigonometry) (2 Units C: LH 30)

Learning Outcomes

At the end of the course students should be able to:

1. explain basic definition of Set, Subset, Union, Intersection, Complements and use of Venn diagrams;
2. solve quadratic equations;
3. solve trigonometric functions;
4. identify various types of numbers; and
5. solve some problems using Binomial theorem.

Course Contents

Elementary set theory; subset, union, intersection, complements, venn diagrams. Real numbers; Integers, Rational and Irrational numbers, mathematical, induction, Sequences and Series, Theory of Quadratic equations, Binomial theorem. Complex numbers; Algebra of complex numbers; the Argand Diagram. De-Moivre's theorem, nth roots of unity, Circular measure, Trigonometric functions of angles of any magnitude, addition and factor formulae.

COS 101: Introduction to Computing Sciences

(3 Units C: LH 30; PH 45)

Learning Outcomes

At the end of the course, students should be able to:

1. explain basic components of computers and other computing devices;
2. describe the various applications of computers;
3. explain information processing and its roles in the society;
4. describe the Internet, its various applications and its impact;
5. explain the different areas of the computing discipline and its specialisations; and
6. demonstrate practical skills on using computers and the internet.

Course Contents

Brief history of computing. Description of the basic components of a computer/computing device. Input/Output devices and peripherals. Hardware, software and human ware. Diverse and growing computer/digital applications. Information processing and its roles in society. The Internet, its applications and its impact on the world today. The different areas/programs of the computing discipline. The job specialisations for computing professionals. The future of computing.

Lab Work: Practical demonstration of the basic parts of a computer. Illustration of different operating systems of different computing devices including desktops, laptops, tablets, smart boards and smart phones. Demonstration of commonly used applications such as word processors, spreadsheets, presentation software and graphics. Illustration of input and output devices including printers, scanners, projectors and smartboards. Practical demonstration of the Internet and its various applications. Illustration of browsers and search engines. How to access online resources.



PHY 101: General Physics I (Mechanics)

(2 Units C: LH 30)

Learning Outcomes

At the end of the course, the student should be able to;

1. identify and deduce the physical quantities and their units;
2. differentiate between vectors and scalars;
3. describe and evaluate motion of systems on the basis of the fundamental laws of mechanics;
4. apply Newton's laws to describe and solve simple problems of motion;
5. evaluate work, energy, velocity, momentum, acceleration, and torque of moving or rotating objects;
6. explain and apply the principles of conservation of energy, linear and angular momentum;
7. describe the laws governing motion under gravity; and
8. explain motion under gravity and quantitatively determine behaviour of objects moving under gravity.

Course Contents

Space and time. Units and dimension, Vectors and Scalars. Differentiation of vectors: displacement, velocity and acceleration. Kinematics. Newton laws of motion (Inertial frames, Impulse, force and action at a distance, momentum conservation). Relative motion. Application of Newtonian mechanics. Equations of motion. Conservation principles in physics. Conservative forces. Conservation of linear momentum. Kinetic energy and work. Potential energy. System of particles. Centre of mass. Rotational motion: Torque, vector product, moment, rotation of coordinate axes and angular momentum. Polar coordinates. Conservation of angular momentum. Circular motion. Moments of inertia. gyroscopes and precession. Gravitation: Newton's Law of Gravitation. Kepler's Laws of Planetary Motion. Gravitational Potential Energy. Escape velocity. Satellites motion and orbits.

PHY 102: General Physics II (Electricity & Magnetism)

(2 Units C: LH 30)

Learning Outcomes

At the end of this course, the student should be able to:

1. describe the electric field and potential, and related concepts, for stationary charges;
2. calculate electrostatic properties of simple charge distributions using Coulomb's law, Gauss's law and electric potential;
3. describe and determine the magnetic field for steady and moving charges;
4. determine the magnetic properties of simple current distributions using Biot-Savart and Ampere's law;
5. describe electromagnetic induction and related concepts, and make calculations using Faraday and Lenz's laws;
6. explain the basic physical of Maxwell's equations in integral form;
7. evaluate DC circuits to determine the electrical parameters; and
8. determine the characteristics of ac voltages and currents in resistors, capacitors, and Inductors.



Course Contents

Forces in nature. Electrostatics; electric charge and its properties, methods of charging. Coulomb's law and superposition. electric field and potential. Gauss's law. Capacitance. Electric dipoles. Energy in electric fields. Conductors and insulators, current, voltage and resistance. Ohm's law and analysis of DC circuits. Magnetic fields. Lorentz force. Biot-Savart and Ampère's laws. magnetic dipoles. Dielectrics. Energy in magnetic fields. Electromotive force. Electromagnetic induction. Self and mutual inductances. Faraday and Lenz's laws. Step up and step-down transformers: Maxwell's equations. Electromagnetic oscillations and waves. AC voltages and currents applied to inductors, capacitors, resistance, and combinations.

PHY 107: General Experimental Physics I

(1 Unit C: PH 45)

Learning Outcomes

At the end of this course, the student should be able to;

1. conduct measurements of some physical quantities;
2. make observations of events, collect and tabulate data;
3. identify and evaluate some common experimental errors;
4. plot and analyse graphs; and
5. draw conclusions from numerical and graphical analysis of data.

Course Contents

This introductory course emphasises quantitative measurements, the treatment of measurement errors and graphical analysis. A variety of experimental techniques should be employed. The experiments include studies of meters, the oscilloscope, mechanical systems, electrical and mechanical resonant systems, light, heat, viscosity etc., covered in PHY 101 and PHY 102. However, emphasis should be placed on the basic physical techniques for observation, measurements, data collection, analysis and deduction.

PHY 108: General Practical Physics II

(1 Unit C: PH 45)

Learning Outcomes

At the end of this course, the student should be able to:

1. conduct measurements of some physical quantities;
2. make observations of events, collect and tabulate data;
3. identify and evaluate some common experimental errors;
4. plot and analyse graphs;
5. draw conclusions from numerical and graphical analysis of data; and
6. prepare and present practical reports.

Course Contents

This practical course is a continuation of PHY 107 and is intended to be taught during the second semester of the 100 level to cover the practical aspect of the theoretical courses that have been covered with emphasis on quantitative measurements. The treatment of measurement errors, and graphical analysis. However, emphasis should be placed on the basic physical techniques for observation, measurements, data collection, analysis and deduction.



200 Level

GST 212: Philosophy, Logic and Human Existence

(2 Units C: LH 30)

Learning Outcomes

A student who has successfully gone through this course should be able to:

1. identify the basic features of philosophy as an academic discipline;
2. identify the main branches of philosophy & the centrality of logic in philosophical discourse;
3. describe the elementary rules of reasoning;
4. distinguish between valid and invalid arguments;
5. think critically and assess arguments in texts, conversations and day-to-day discussions;
6. critically assess the rationality or otherwise of human conduct under different existential conditions;
7. develop the capacity to extrapolate and deploy expertise in logic to other areas of knowledge, and
8. guide his or her actions, using the knowledge and expertise acquired in philosophy and logic.

Course Contents

Scope of philosophy; notions, meanings, branches and problems of philosophy. Logic as an indispensable tool of philosophy. Elements of syllogism, symbolic logic— the first nine rules of inference. Informal fallacies, laws of thought, nature of arguments. Valid and invalid arguments, logic of form and logic of content — deduction, induction and inferences. Creative and critical thinking. Impact of philosophy on human existence. Philosophy and politics, philosophy and human conduct, philosophy and religion, philosophy and human values, philosophy and character molding and many others.

ENT 211: Entrepreneurship and Innovation

(2 Units C: LH 30)

Learning Outcomes

At the end of this course, students should be able to:

1. explain the concepts and theories of entrepreneurship, intrapreneurship, opportunity seeking, new value creation, and risk taking;
2. state the characteristics of an entrepreneur;
3. analyse the importance of micro and small businesses in wealth creation, employment, and financial independence;
4. engage in entrepreneurial thinking;
5. identify key elements in innovation;
6. describe stages in enterprise formation, partnership and networking including business planning;
7. describe contemporary entrepreneurial issues in Nigeria, Africa and the rest of the world; and
8. state the basic principles of e-commerce.



Course Contents

Concept of Entrepreneurship (Entrepreneurship, Intrapreneurship/Corporate Entrepreneurship). Theories, Rationale and relevance of Entrepreneurship (Schumpeterian and other perspectives, Risk-Taking, Necessity and opportunity-based entrepreneurship and Creative destruction). Characteristics of Entrepreneurs (Opportunity seeker, Risk taker, Natural and Nurtured, Problem solver and change agent, Innovator and creative thinker). Entrepreneurial thinking (Critical thinking, Reflective thinking, and Creative thinking). Innovation (Concept of innovation, Dimensions of innovation, Change and innovation, Knowledge and innovation). Enterprise formation, partnership and networking (Basics of Business Plan, Forms of business ownership, Business registration and Forming alliances and joint ventures). Contemporary Entrepreneurship Issues (Knowledge, Skills and Technology, Intellectual property, Virtual office, Networking). Entrepreneurship in Nigeria (Biography of inspirational Entrepreneurs, Youth and women entrepreneurship, Entrepreneurship support institutions, Youth enterprise networks and Environmental and cultural barriers to entrepreneurship). Basic principles of e-commerce.

PHS 201: Introduction to Public Health

(2 Units C: LH 30)

Learning Outcomes

At the end of the course, students should be able to:

1. explain the history and philosophy of public health and its core values;
2. explain the concept of public health and its function in Nigeria and across the globe;
3. demonstrate competence in explaining various concepts of public health;
4. identify different branches of public health and their application in National Health Policy; and
5. explain the various layers of health care and the agencies responsible at each level.

Course Contents

Definition of Health. The WHO definition, its limitation, other definitions of Health. Historical development in Health. Historical Perspective of Health. Definition of Public Health. Its history and development. Branches of Public health. Primary Health care, secondary Health care and Tertiary health care facilities. Role of respective tiers of Government in Health Provision.

PHS 202: Biostatistics

(2 Units C: LH 30)

Learning Outcomes

At the end of the course, students should be able to:

1. demonstrate knowledge of interval estimation and hypothesis testing;
2. apply the correct statistical method to analyse one or more variables;
3. interpret statistical results effectively and correctly;
4. appreciate the importance of data and demonstrate reasonable statistical skills; and
5. explain the concept of sampling from a study population in a health study.



Course Contents

The course is planned to equip the undergraduates in all the disciplines of health sciences with the necessary tools and skills for collecting, analysing, interpreting data quantitatively. Topics to be covered include: The central role of statistics in health sciences disciplines, data description, elements of probability. Description of random variables. Applications of the binomial and normal distributions. Estimation and confidence intervals. Contingency tables. Regression and variance analysis. Study design and hypothesis testing for practical purposes. Students are provided with specific data to work on and are also required to develop simple questionnaire protocols for analysis.

PHS 203: Principles of Epidemiology (Infectious Disease Epidemiology and Immunisation Techniques) (2 Units C: LH 30)

Learning Outcomes

At the end of the course, students should be able to:

1. develop knowledge of quantitative and qualitative techniques of epidemiology;
2. plan and conduct valid epidemiological activities;
3. apply field method of primary and secondary data collection;
4. describe routine methods of data analysis;
5. compare the strength and weakness of various experimental designs;
6. implement and interpret result of a study to address health issues;
7. develop critical skills for evaluation of epidemiological findings in reports and studies;
8. define objectives of outbreak investigation in a population;
9. describe the basic principle of screening and outbreak investigation;
10. explain immunisation and its problems;
11. demonstrate knowledge of experimental design, data collection, analysis and interpretation of data of an outbreak; and
12. appreciate and identify risk factors of an outbreak and communicate same to health authorities.

Course Contents

The course gives the students an overview of epidemiology, disease control and surveillance. Specific areas highlighted include the uses of epidemiology; Epidemiology protocols and survey methods. Calculation of basic epidemiological measures. Epidemiology of communicable and non-communicable diseases. Vital statistical and national health information systems. Human ecology and disease processes. Public health laboratory practices methods and Intervention. Strategies in Disease Control and Surveillance. Immunisation for communicable diseases. Immunisation routine and procedures. Ethical issues on collection, use and dissemination of epidemiological data. Students are expected to participate actively in Disease control, surveillance as well as in the monitoring and evaluation processes of selected endemic diseases at the national, state, and local government operational levels. Students are expected to propose an appropriate epidemiological problem. Identify a population. choose a method and design for sampling from the population. Choose and propose records for ascertainment and classification of diseases and risk factors. Outline a plan of action for data collection and presentation. Students are expected to participate actively in fieldwork assignments and to submit reports. Both communicable and non-communicable morbidity and mortality patterns and trends in Nigeria and elsewhere should be highlighted.



PHS 204: Demography and Social Statistics in Public Health

(2 Units C: LH 30)

Learning Outcomes

At the end of the course, students should be able to:

1. demonstrate a clear understanding of basics of demography;
2. discuss the importance of demography in health issues;
3. describe social demographic variables and how they affect population composition and growth;
4. explain knowledge attitudes and practice as demographic tools in public health research;
5. discuss population mobility and its consequences on public health; and
6. identify and interpret population and demographic health data.

Course Contents

Introduction to demographic and the emphasis is on the use of demographic materials and methods for planning, policy analysis, and evaluative research in public health. Emphasis should be placed on the demographic features of the Nigerian population, its size, composition and distribution should be highlighted. Response of demography to mortality, fertility and migration. Health need of each population group and health planning in relation to demography. The course gives an overview of the Nigerian population policies. Trends in general population growth are featured prominently in the course. Topics to cover include: sources and quality of data from census, special surveys, and other vital registration systems. Students are to present the descriptive statistics and graphics with report writing and submit assigned projects.

ANA 201: Anatomy of Upper & Lower Limbs

(2 Units C: LH 15; PH 45)

Learning Outcomes

At the end of the course, students should be able to:

1. define fundamental anatomical terminology and discuss the anatomical position;
2. describe the anatomy of the musculoskeletal system, including the axial skeleton; appendicular skeleton, appendicular and axial muscles, and arthrology;
3. describe the general features of the bones of the upper and lower limbs;
4. identify the major muscles of the upper and lower limbs;
5. explain the types and structure of the joints of the upper and lower limbs;
6. correlate between the attachment of the muscles and their functions on the different joints;
7. identify the major nerves of the upper and lower limbs;
8. describe the functional components of each of the major nerves and its distribution;
9. identify and describe the course of the major superficial veins of the upper and lower limbs; and
10. name the major arteries of the upper and lower limbs.

Course Contents

Descriptive terms, planes and terms of relationship of the human body, terms of comparison, attachment of muscles, types of muscles, movements of joints. Osteology, principles of kinesiology, general organization of body system. Cutaneous innervation of the upper limb; pectoral region; breast; axilla; shoulder region; arm and cubital fossa; flexor compartment of forearm; extensor compartment of forearm; hand; venous and lymphatic drainage of the upper limb. Applied anatomy of nerves; blood supply of the upper limb. Cutaneous innervation of the lower limb; femoral triangle; adductor canal and medial side of the thigh; gluteal region; back of



the thigh, popliteal fossa; extensor compartment of the leg and dorsum of the foot; peroneal and flexor compartment of the leg; sole of the foot, arches of the foot; mechanism of walking; venous and lymphatic drainage of the lower limb; applied anatomy of the nerves and blood supply to the lower limb.

PIO 201: Introductory Physiology and Blood

(2 Units C: LH 30)

Learning Outcomes

At the end of the course, students should be able to:

1. describe the composition of a cell membrane;
2. explain how a potential difference across a membrane will influence the distribution of a cation and an anion;
3. describe how transport rates of certain molecules and ions are accelerated by specific membrane transport proteins;
4. distinguish between active (primary and secondary) transport, facilitated diffusion, and passive diffusion based on energy source and carrier protein involvement;
5. identify the mechanisms and role of selective transporters for amino acids, neurotransmitters, nutrients, etc.;
6. explain the general concepts of homeostasis and the principles of positive and negative feedback in physiological systems;
7. identify the site of erythropoietin production, the stimulus for its release, and the target tissue for erythropoietin action;
8. discuss the normal balance of red blood cell synthesis and destruction, including how imbalances in each lead to anemia or polycythemia;
9. list and differentiate the various types of leukocytes;
10. describe the role of thrombocytes in haemostasis; and
11. list clotting factors and the discuss the mechanism of anti-coagulants.

Course Contents

Introduction and history of physiology. Structure and functions of cell membranes. Transport process. Special transport mechanism in amphibian bladder, kidney, gall bladder, intestine, astrocytes and exocrine glands. Biophysical principles. Homeostasis and control systems including temperature regulation. Biological rhythms. Composition and functions of blood. Haemopoiesis. WBC and differential count. Plasma proteins Coagulation, fibrinolysis and platelet functions. Blood groups –ABO system – Rh system. Blood transfusion – indication for collection and storage of blood, hazards of blood transfusions. Reticulo- endothelial system. Imunity and immoderacy disease and HIV.

BCH 201: General Biochemistry I

(2 Units C: LH 30)

Learning outcome:

At the end of the lectures, students should be able to:

1. explain the structure of different macromolecules in biological system;
2. identify types of chemical reactions involving these macromolecules;
3. explain the various methods of isolation of these macromolecules;
4. estimate the effects of acids and alkalis on the macromolecules;
5. describe how to purify the macromolecules; and
6. discuss quantification of the various macromolecules.



Course Contents

Introductory chemistry of amino acids; their properties, reactions, and biological functions. Classification of amino acids: neutral, basic and acidic; polar and non-polar; essential and non-essential amino acids. Peptides. Introductory chemistry and classification of proteins. Biological functions of proteins. Methods of their isolation, purification, and identification. Primary, secondary, tertiary and quaternary structures of proteins. Basic principles of tests for proteins and amino acids. Introductory chemistry of carbohydrates, lipids and nucleic acids. Nomenclature of nucleosides, and nucleotides. Effects of acid and alkali on hydrolysis of nucleic acids.

MCB 201: General Microbiology

(2 Units C: LH 15; PH 45)

Learning Outcomes

At the end of the course, students should be able to:

1. discuss basic concepts and scope of microbiology;
2. describe the layout of a microbiology laboratory, equipment and reagents in a microbiology laboratory; and
3. discuss the theory behind basic protocols in a microbiology laboratory.

Course Contents

History of the Science of Microbiology. Classification of organisms into prokaryotes and eukaryotes; Classification of prokaryotes into archaea and eubacteria. Anatomy and cytochemistry of bacteria and fungi. Shapes, groupings and colonial morphology of bacteria and fungi. Structure of viruses. Sterilization and disinfection; Structure, ecology and reproduction of representative microbial genera. Culture of micro-organisms. Isolation of micro-organisms; isolation of bacteria, virus, fungi (yeasts and moulds. Nutrition and biochemical activities of micro-organisms. Antigens and antibodies. Identification and economic importance of selected microbial groups. Microbial variation and heredity. Study of laboratory Equipment. Introduction to microbiology of air, food, milk, dairy products, water and soil. Staining techniques. Antibiotic sensitivity tests. Serological tests. Antimicrobial agents.

300 Level

GST 312: Peace and Conflict Resolution

(2 Units C: LH 30)

Learning Outcomes

At the end of the course, students should be able to:

1. analyse the concepts of peace, conflict and security;
2. list major forms, types and root causes of conflict and violence;
3. differentiate between conflict and terrorism;
4. enumerate security and peace building strategies; and
5. describe roles of international organisations, media and traditional institutions in peace building.



Course Contents

Concepts of Peace. Conflict and Security in a multi-ethnic nation. Types and Theories of Conflicts: Ethnic, Religious, Economic, Geo-political Conflicts. Structural Conflict Theory, Realist Theory of Conflict, Frustration-Aggression Conflict Theory. Root causes of Conflict and Violence in Africa: Indigene and settlers Phenomenon. Boundaries/boarder disputes. Political disputes. Ethnic disputes and rivalries. Economic Inequalities; Social disputes; Nationalist Movements and Agitations; Selected Conflict Case Studies – Tiv-Junkun; Zango Kartaf, Chieftaincy and Land disputes and many others. Peace Building, Management of Conflicts and Security: Peace & Human Development. Approaches to Peace & Conflict Management --- (Religious, Government, Community Leaders and many others). Elements of Peace Studies and Conflict Resolution: Conflict dynamics assessment Scales: Constructive & Destructive. Justice and Legal framework: Concepts of Social Justice; The Nigeria Legal System. Insurgency and Terrorism. Peace Mediation and Peace Keeping. Peace & Security Council (International, National and Local levels) Agents of Conflict resolution – Conventions, Treaties Community Policing: Evolution and Imperatives. Alternative Dispute Resolution, ADR. Dialogue b). Arbitration c). Negotiation d). Collaboration and many others. Roles of International Organisations in Conflict Resolution. (a). The United Nations, UN and its Conflict Resolution Organs. (b). The African Union & Peace Security Council (c). ECOWAS in Peace Keeping. Media and Traditional Institutions in Peace Building. Managing Post-Conflict Situations/Crisis: Refugees. Internally Displaced Persons, IDPs. The role of NGOs in Post-Conflict Situations/Crisis.

ENT 312: Venture Creation

(2 Units C: LH 15; PH 45)

Learning Outcomes

At the end of this course, students, through case study and practical approaches, should be able to:

1. describe the key steps in venture creation;
2. spot opportunities in problems and in high potential sectors regardless of geographical location;
3. state how original products, ideas, and concepts are developed;
4. develop business concept for further incubation or pitching for funding;
5. identify key sources of entrepreneurial finance;
6. implement the requirements for establishing and managing micro and small enterprises;
7. conduct entrepreneurial marketing and e-commerce;
8. apply a wide variety of emerging technological solutions to entrepreneurship; and
9. appreciate why ventures fail due to lack of planning and poor implementation.

Course Contents

Opportunity Identification (Sources of business opportunities in Nigeria, Environmental scanning, Demand and supply gap/unmet needs/market gaps/Market Research, Unutilised resources, Social and climate conditions and Technology adoption gap). New business development (business planning, market research). Entrepreneurial Finance (Venture capital, Equity finance, Micro finance, Personal savings, Small business investment organisations and Business plan competition). Entrepreneurial marketing and e-commerce (Principles of marketing, Customer Acquisition & Retention, B2B, C2C and B2C models of e-commerce, First Mover Advantage, E-commerce business models and Successful E-Commerce Companies,). Small Business Management/Family Business: Leadership & Management, Basic book keeping, Nature of family business and Family Business Growth Model. Negotiation and Business communication (Strategy



and tactics of negotiation/bargaining, Traditional and modern business communication methods). Opportunity Discovery Demonstrations (Business idea generation presentations, Business idea Contest, brainstorming sessions, Idea pitching). Technological Solutions (The Concept of Market/Customer Solution, Customer Solution and Emerging Technologies, Business Applications of New Technologies - *Artificial Intelligence (AI)*, *Virtual/Mixed Reality (VR)*, *Internet of Things (IoTs)*, *Blockchain*, *Cloud Computing*, *Renewable Energy* and many others. Digital Business and E-Commerce Strategies).

PHS 301: Public Health Microbiology and Parasitology/Entomology (2 Units C: LH 30)

Learning Outcomes

At the end of the course, students should be able to:

1. differentiate between major groups of micro-organisms;
2. identify and evaluate infections of public health significance caused by bacteria, virus, fungi;
3. identify and evaluate infections of public health significance caused by parasites;
4. describe and explain the pathogenesis of microbial and parasitic infections;
5. be able to explain the process of transmission of microbial and parasitic infections;
6. identify major reservoirs of parasites and microorganism and their roles in transmission;
7. identify the roles of vectors in transmission of microbial and parasitic diseases;
8. describe the life cycle of major insect vectors of parasitic disease and their effective mode of control;and
9. demonstrate knowledge for the control and intervention strategies of microbial and parasitic diseases.

Course Contents

The course covers the study of the characteristics and identification of microorganisms particularly different species of bacteria and parasites. Emphasis is placed on the specific microbial and parasitic agents of communicable and parasitic diseases, most notably Tuberculosis, the Neglected Tropical Diseases (NTDs) such as Malaria, Schistosomiasis, Onchocerciasis, Dracontiasis and Trypanosomiasis prevalent in the community. Environmental factors favouring their reservoir and intermediate hosts, communicability as well as salient features for their control will be highlighted. Current issues regarding the control intervention, and prevention strategies of these infections and infestations are discussed. Additional emphasis will be placed on the identification of microbial pollutants and contaminants in food and water sources. Laboratory exercises will be used extensively to identify the organisms and visits will be made to water treatment sites, food storage, food handling/preparation points to identify sources of contaminants thereby providing the basis for personal and community health stance. Studies on Insects of medical importance, such as Mosquito, Tsetse fly, Black fly, ticks, and mites their life cycle and control should also be discussed. Vectors, Biological vectors, mechanical vectors, and zoonosis should be discussed.



PHS 302: Health Programme Planning and Evaluation

(2 Units C: LH 30)

Learning Outcomes

At the end of the course, students should be able to:

1. conduct community health assessment needs and identify gaps {problems};
2. demonstrate knowledge of identifying and writing of objectives of health program;
3. develop an evaluation strategy/mechanism for health program;
4. develop skills of evaluating health budgets and other financial proposals;
5. identify barriers to successful implementation of health programs;
6. demonstrate adequate skills to develop, implement and evaluate a health program;
7. explain the different types of planning and evaluation; and
8. explain the importance of stakeholders in planning a health program.

Course Contents

The course is intended to prepare public health students of the health sciences to organise health programs that meet specific and identified community needs. The course also highlights the critical issues and logical questions in health planning. The main functions of managements, the implementation function. The supports systems to implement health care programs. The evaluation processes, and the health information format. Skills include setting goals and objectives. Selecting strategies, assessing, and mobilising internal and external resources linking implementing and evaluating results. Evaluation procedures such as engaging stake holders, assessing resources and developing evaluation question and how to evaluate health budget. Different types of evaluation, formative evaluation, process evaluation and summative evaluation. Different types of planning, Strategic and Operational planning.

PHS 303: Environmental Health and Public Health Laws

(2 Units C: LH 30)

Learning Outcomes

At the end of the course, students should be able to:

1. describe the link between environmental factors and health of a community;
2. explain the critical role the environment plays in the health of a population;
3. identify potential health hazards to the community of exposure to biological, chemical and physical pollutants;
4. describe factors that increases the chances of health hazards due to exposure to contaminants;
5. conduct an Environmental Health Impact assessment of a given community to a potential risk factor;
6. explain the scope of public health laws and its focus; and
7. describe the process of environmental health law enforcement.

Course Contents

The course is designed for the undergraduates in public health and others in the health sciences programs. Highlights the three cardinal areas of the environment i.e. the biological, physical/chemical and the socio-cultural environments. Components of the environment. The problems, deteriorating forms/characteristics of the man-made environments with attendant consequences. The important topics in the course include urban and rural environments with particular emphasis on the housing problems. Control of food, water and sanitation. Refuse/solid wastes disposal and management. Air and water pollution particularly in the riverine areas.



Psychological, physiological, and genetic factors that affects health after exposure to environmental hazards. Genetic and physiological factors that predisposes disease as a result of environmental contamination. Visits could be made to specific site to observe conditions existing with regards to air pollution, food sanitation and solid wastes disposal. The various agencies involved in environmental protection in relation to policies, laws, regulation codes and ordinances. Definition and perspective of public health laws. Historical perspective of public health laws. Framework and rationale of public health laws. Major health offences and Procedure of enforcement. Environmental risk assessment. Students chose specific topics of interest for project presentation at class seminars. Environmental Health Laws. Procedures for enforcement of environmental health laws.

PHS 304: Occupational Health and Disaster Management

(2 Units C: LH 30)

Learning Outcomes

At the end of the course, students should be able to:

1. describe the basic concept of occupational health;
2. recognise risk factors of injuries in different working environment in the country and other countries;
3. associate different occupations with risk factors for injuries or illness;
4. describe major steps of risk prevention in workplace;
5. apply laws and industrial standard requirements in industries and other workplaces to ensure safety;
6. create job safety analysis using data obtained on injuries and risk factors for every occupation;
7. coordinate the activities of all stake holders during emergency response operation;
8. employ planning to mitigate and recover from a disaster; and
9. participate constructively as a member of disaster management team at sites or location of disaster.

Course Contents

The course is designed for the undergraduates in public health and others in the health Sciences programs. Overview of the history of occupational health in Nigeria and elsewhere. Attention is focused on selected occupational health problems of the various industries and occupations. Various target organs and systems affected by specific hazards are highlighted. Specific areas relating to health hazards from new environmental pollutants and early detection of impairments. Various legislations concerning safety measures for the workers and the work environments are reviewed. Visits to the various industrial setting and other places of interest to identify specific problems. Disaster and disaster Management. Phases of Disaster Management and risk reduction right from Disaster declaration process. How to conduct annual hazard mitigation risk assessment. How preparation is made for Disaster Management, such as preparation for flood, windstorm, land slide and collapsing of buildings and other Disaster issues as well as emergency response procedures and action plans. Procedures at disaster management centres or site of a disaster. Managing humanitarian crises and those of Response and Recovery after a Disaster.



PHS 305: Family and Reproductive Health (MCH)

(1 Unit C: LH 15)

Learning Outcomes

At the end of the course, students should be able to:

1. define reproductive health and know its importance in public health;
2. appreciate the magnitude of reproductive health problem;
3. explain the relationship between reproductive health and gender;
4. identify physical and emotional changes associated with puberty; and
5. explain the various contraceptive techniques and the problems associated with each.

Course Contents

Meaning and significance of family health in the context of primary health care. A review of the various social structures of the family provides the student with an understanding of the types of family structures they may likely encounter during practice. Knowledge relating to organisation of family health services. Special areas of emphasis include contemporary issues on gender preference; Genital mutilation. Human sexuality, puberty and the changes associated with it. Contraceptives and family planning. Reproductive health and population dynamics are also featured.

PHS 306: Community Health Practicum I

(2 Units C: PH 90)

Learning Outcomes

At the end of the course, students should be able to:

1. demonstrate knowledge on types of questionnaires;
2. explain the different types of questionnaire administration;
3. demonstrate field work leadership ability and teamwork; and
4. analyse and clean data obtained from the field in the questionnaires.

Course Contents

The students at this stage utilise a structured household questionnaire to collect information on health of families in the community. The structured questionnaires are patterned after those of the primary health care system. The information collected by each of the student groups are recorded, analysed and submitted as a report of the fieldwork activities. The practice gives the students an opportunity to translate theoretical concepts and principles in public health into practical experiences needed for program formulation, planning and implementation. At the end of the community practicum, students are expected to present results/findings in the form of a seminar to the department which shall be graded.

PHS 308: Public Health Nutrition

(2 Unit C: LH 30)

Learning Outcomes

At the end of the course, students should be able to:

1. explain the different classes of food;
2. demonstrate understanding of role of nutrition in disease prevention in a community;
3. describe the role played by nutrition in diseases such as obesity, diabetes and heart diseases;
4. evaluate nutrition programs of children under five; and
5. explain the national nutritional goals and its associated problems.



Course Contents

The course deals with nutrition issues, which affect the nutritional states of the community. Classification of food. Nutritional value of food and its health effect. Obesity and its health implications. The topics presented are developed within the framework of specific age groups. Areas covered include identification of community nutritional problems, needs, and resources available. Also, emphasis will be directed on planning and administration of programs and services. Evaluation of program effects and developments of skills in the areas of nutrition, education, and communication. Attention will also be focused on national nutrition goals.

Skills will be directed at community nutrition surveys in children 0 – 5 years and school children up to the age of 18 years. National nutrition policy. Government work plans will be reviewed to assess the dietary patterns in the community. Special diets in health and during illness are discussed. Students are expected to participate actively in community and institutional nutritional surveys using the structured questionnaire prepared by staff and students.

400 Level

PHS 401: Health Policy and Finance

(2 Units C: LH 30)

Learning Outcomes

At the end of the course, students should be able to:

1. demonstrate knowledge of expertise of the health care system of Nigeria;
2. describe how public health and health care are organised and financed in Nigeria;
3. communicate health policies to a community using appropriate media;
4. discuss the concept of demand and supply and its application in health care;
5. identify the roles of various health care agencies and their respective policy documents in Nigeria;
6. discuss public health policy making and health reform;
7. demonstrate knowledge of how politics and socio-economic policies affect health care system in Nigeria;
8. demonstrate skills in health care budgeting and critically evaluate health care financing; and
9. evaluate other Government policies that have bearing to health.

Course Contents

The course is designed to acquaint students in the discipline of health sciences with management information and skills in matters relating to all aspects of the national health care systems and Policies, (the primary health care, the secondary health care and the tertiary health care systems). The course gives an overview of the national health policy and the development of the national health systems. Introduction to Nigeria Health care system. Definition of Health Economics and health care finance. Principles of demand and supply and their application to health care. How societies pay for health care services. Primary role of finance in Health care organisation, the four Cs, cost, cash, capital and control. Health Financing and different methods of Financing Health needs. Principles and practice of Health Insurance Scheme and challenges of the programme. Health Policy Management. National Health Care Agencies in Nigeria. Process of Health Budgeting Law making in State and Federal Government. Social Policies for vulnerable populations in Nigeria. Evaluation of Health care policies. Elements of financial management, health care settings, Government Hospitals, Private Hospital, Private no Profit Hospitals, other sources of health care like patent medical stores in village communities. Outpatient care, long term care and its cost



implication. Regulations and Legal Issues in health care and its financing. Health care budget and financial challenges of the health care system.

PHS 402: Health Systems, Planning, Management and Administration (2 Units C: LH 30)

Learning Outcomes

At the end of the course, students should be able to:

1. demonstrate understanding of the Nigerian Health care system;
2. analyse the impact of policies, budgets, and programmes on health;
3. state the roles of the three tiers of Government in health care provision in Nigeria;
4. describe the importance of human resource and financial management in health care delivery;
5. identify components of the organisation, financing, and delivery of health care in Nigeria;
6. demonstrate effective leadership and communication skills within context of health care;
7. explain the administrative and management system for effective health care delivery; and
8. demonstrate the ability to apply management and administrative concepts in health.

Course Contents

The course is designed to acquaint students in the discipline of health sciences with management information and skills in matters relating to all aspects of the national health care systems, (the primary health care, the secondary health care and the tertiary health care systems). Students should learn organisational behaviour, theories of motivation and managerial skills. The course gives an overview of the national health policy and the development of the national health systems. The roles of governments at each of the levels and those of the NGOs are highlighted. Modern concepts and elements of management by objectives are reviewed in the context of health planning, implementation and health programme monitoring and evaluation. Principles and practice of Health Insurance Scheme and challenges of the programme. Modalities for leading health team and organising health care activities are as well highlighted. Methods and means of managing human and material resources are also covered. The course covers also various aspects of selected international health care system.

PHS 403: Health Sociology

(2 Units C: LH 30)

Learning Outcomes

At the end of the course, students should be able to:

1. explain major social issues related to population and individual health;
2. demonstrate sound understanding of concept of sociology and illness;
3. explain health issues from sociological perspective;
4. evaluate concept of health from different sociological approaches;
5. explain health inequalities and their consequences;
6. demonstrate knowledge of ethnic inequalities, gender inequalities and social inequalities of health; and
7. discuss the modalities of care of the elderly and orphanage.

Course Contents

This course reviews social determinants of health. How education status, social status and economic status affects health. Sociological perspective of health. The functionalist approach, the conflict approach, and the interactionist approach. The social issues in health with reference to the services offered such as social welfare services, care of the motherless babies, care, and



rehabilitation of the handicapped, care of the elderly and the care of destitute/beggars are discussed. Inequality and social class in relation to health. Ethnicity. gender and health. Health equity and social stigmatisation are taught.

PHS 405: Community Health Care Practicum II

(2 Units C: LH 15; PH 45)

Learning Outcomes

At the end of the course, students should be able to:

1. undertake a community-based need assessment and propose how the community can address its health needs;
2. organise, plan, and participate in a community health improvement programme; and
3. develop health education material base on the culture and religion of the community.

Course Contents

The Community Health Practicum gives the students the opportunity to participate in on-going intervention programs and activities at the Local Government, the community and health facility levels. The students are to produce reports on health systems research based on their experiences at different levels of activities. At the end of the community practicum, students are expected to present his results/findings in the form of a seminar to the department which shall be graded.

Note This consists of lectures and guided visits to various public health programmes including the following: Environmental health services including visits to water treatment works, sewage treatment plants, market and other food processing factories and abattoirs, refuse disposal systems and many other. Community Welfare Services lectures and visits to remand home. Homes for motherless and handicapped children, prisons, schools for the deaf and many others. Public Health Department: Lectures and visits to familiarize with the activities of the department. Maternal and Child Health Services; lectures and visits. Public Health Laboratories; lectures and demonstration on their activities including testing of water and many others. Control of Communicable diseases, lectures and visits to the tuberculosis clinic and the infectious diseases clinics. Occupational Health Services; lectures and visits to selected industries.*

PHS 409: International and Global Health

(2 Units C: LH 30)

Learning Outcomes

At the end of the course, students should be able to:

1. demonstrate knowledge of history and initiatives of global health;
2. identify major players and explain their role in promoting international health;
3. discuss models of assistance in global health;
4. identify sources of international health funding and assistance;
5. demonstrate clear understanding on the workings of Agencies such as WHO, UNICEF, UNDP; and
6. recognise the role of international donor agencies and philanthropic organisations and their role in global health.



Course Contents

The course introduces the students in the public health program to the historical perspective of the international health agencies. It also highlights the policies governing international collaboration and coordination on issues relating to health and development at the global level. Various agencies involved and activities of these bodies are also highlighted. Historical backgrounds to the development of international collaboration in health issues are covered. Special attention is devoted to the activities of the United Nations Agencies, particularly those of the W.H.O, UNICEF, UNDP, UNFPA and Bilateral agencies such as ODA, USAID, the World Bank, amongst others. The policies governing International Coordination of Global health are also reviewed. Students should be taught role of International Philanthropic organisations such as Melinda and Bill Gates Foundation in Health care, also sources of funding global Health and access to funding.

PHS 411: Principles of Pharmacology, Therapeutics and Substance Abuse (2 Units C: LH 30)

Learning Outcomes

At the end of the course, students should be able to:

1. describe the method through which drugs are discovered, tested, produced, and finally approved for use;
2. explain the role of pharmaceutical drugs in health and society;
3. demonstrate knowledge of classification of drugs and the most commonly used drugs in health care;
4. describe the process of drug procurement, storage, and usage in a health centre;
5. demonstrate knowledge of drug testing to identify fake and counterfeit drugs;
6. understand the role of complementary and alternative medicine in health care system.;
7. identify crises situation concerning substance abuse and determine appropriate action;
8. discuss the effect of alcohol and other drugs to human body;
9. identify sociological factors associated with alcohol and other substances abuse;
10. demonstrate knowledge of treatment issues associated with alcoholism and other substance abuse; and
11. advocate enhanced method of alcohol use that will reduce damage to health.

Course Contents

The course is designed to provide the students with an understanding of the sources of drugs. Classification and composition of drugs. Alternative and complementary medicines. Use and abuse of drugs. Use and abuse of alcoholic beverages. Action and reaction of drugs and alcoholic beverages (prophylactic, therapeutic and toxicological effects). Legal control of drugs and alcoholic beverages. The concepts of drugs and alcoholic beverage use and abuse. Role of NAFDAC in standardisation of drugs. Fake and counterfeit drugs. NDLEA and fight against drug abuse.



PHS 400: Research Project

(3 Units C: PH 135)

Each student is expected to identify an area of research interest and develop a research proposal that would enable the student to conduct a study under the supervision of faculty staff. A suitable research topic must include primary data collection using either of the discussed methods of data collection. Secondary data may be collected and analysed to prove a hypothesis or an existing environmental condition or social factors affecting health.

Minimum Academic Standards

Equipment

The following academic and administration equipment shall be available in the stated minimum quantity:

At least 1 computer to 5 students

Computers and Printers for the Department

Overhead projector with its accessories

Photocopying machine

Photo Camera

Video Camera

Audio visual equipment for the Media Center

Video/Tape Recorders/Player

Television

VCR (Video recording / Playback)

DVD/CD players

Multimedia Projector

Slide Projector and Slide

Equipment for field work such as Van for health outreach programmes, Scales height and measurement, hand gloves, safety helmets, reflective jackets.

White Board

Public health museum

Drones and micro – video cameras for aerial environmental/community observation

Staffing

The selection of a staff member shall be based on; educational qualifications, experience, scholarly achievements in research and community service, teaching and positive-influence personality. See the academic staff requirements for the Discipline. The academic staff to Student ratio should be at least 1:15.

Library

There shall be enough learning resources materials such as textbooks, periodicals, Journals in the relevant subject areas. Also, there should be advanced Information technology equipment and resource materials available.

Classrooms, Laboratories and Office spaces

Classroom

The standard requirement of 0.65m² per full-time student should be maintained. Thus the minimum total space requirement for a faculty or department shall be the product of its total full



time equivalent student enrolment (FTE) and the minimum space requirement per full-time equivalent i.e. (FTE) 0.65m².

Office

In this respect, each academic staff should have an office space of at least 25 square metres taking into cognisance the status/cadre of the staff

In addition, there should be for the Faculty, a Dean's office and for each Department a Head of Department's office with attached offices for their supporting staff as specified below in m²:

| | | |
|----------------------------------|---|-------|
| Professor's office | - | 18.50 |
| Head of Department's office | - | 18.50 |
| Tutorial teaching staff's office | - | 13.50 |
| Other teaching staff space | - | 7.00 |
| Technical staff space | - | 7.00 |
| Secretarial space | - | 7.00 |
| Staff research laboratory | - | 16.50 |
| Seminar Space/per student | - | 1.85 |
| Laboratory space (per student) | - | 7.50 |



B.Rad. Radiography

Overview

Radiography is a technology-driven profession which involves the use of various forms of radiation to treat diseases (radiotherapy) or produce high quality images (radiodiagnosis) to aid in the diagnosis and subsequent treatment of injury and disease. Though historically radiography primarily used x-ray, advanced technology now embraces techniques in computerised tomography (CT), ultrasonography (U/S), magnetic resonance imaging (MRI), Nuclear Medicine (N/M) among other. Radiographers play pivotal role in selecting and implementing the most appropriate radio-diagnostic and therapeutic protocols to answer clinical questions.

In this 5-year Bachelor of Radiography degree programme which should be domiciled in the Department of Radiography and Radiation Sciences, students acquire the scientific knowledge in anatomy, physiology, pathology, radiation science and diagnostic medical imaging / radiation therapy techniques and thus develop clinical and patient care skills that enable them enter the radiography profession on probation basis on graduation and are positioned for specialisation.

Philosophy

Radiography has experienced rapid and tremendous changes in the recent past due to scientific/ technological advances in medical imaging/therapy and associated role development. Consequently, the body of knowledge necessary to cope with these advances and the abilities, expertise, skills and responsibilities has similarly expanded.

From the initial analogue/ photographic approach to radiography practice to the present electronic signal transfer and wholly digital process embracing automation with artificial intelligence in its operations, there is need for a paradigm shift in training. Radiography education must thus address these issues in frame work and be poised for a continuous review as the need arises.

Objectives

The programme is designed to:

1. prepare students with sufficient theoretical scientific knowledge base and practical skills that enable them assume professional positions as radiographers/diagnostic medical image scientists who can use the most complex medical imaging equipment for radio-diagnostic and therapeutic procedures;
2. develop in students, the relevant practical and technological competence in radiography practice at primary, secondary and tertiary levels of healthcare and in the global environment;
3. assist students in the development of interpersonal skills necessary to function as members of the health team;
4. develop in students good working knowledge and skills in all modalities and be equipped to specialise in any of the subspecialties after qualification;
5. prepare students with sufficient knowledge and analytical skills that equip them for further studies, and research development;
6. generate in students an appreciation of the role of radiography in healthcare delivery, environmental and social relevance, such as rural radiography, bioinformatics and information technology; and



7. develop in students the spirit of entrepreneurship so that on graduation, they can cope with self-employment especially in the radiography/ medical imaging industry.

Unique Features of the Programme

The programme has peculiar features, as it stands out to be among the first to introduce artificial intelligence, rural radiography and radiography education into the undergraduate curriculum. These features aim to meet both local and international needs in the practice of radiography profession particularly as Nigerian trained radiography graduates are in high demand and presently working everywhere all over the world.

In addition the program has been drawn to compete with the best radiography program in the United Kingdom, United States of America, Australia, Canada among others. Other Medical imaging modalities in the previous BMAS has been unbundled into its component parts as MRI, CT, Ultrasonography and Scintigraphy and consequently received more emphasis than the former BMAS. This is to enable graduates acquire relevant skills during training to cope with the demands of clients in these emerging areas of medical imaging/radiography

Employability Skills

The course content and its delivery aim at equipping the graduates of this program with the following employability and soft skills:

1. diagnostic/Therapeutic Medical Imaging and anatomical skills;
2. information and technology skills;
3. Initiative and entrepreneurship skills; and
4. Self-management and development skills

21st Century Skills

1. Collaboration and team work
2. Creativity and imagination
3. Critical thinking
4. Problem solving
5. Flexibility and adaptability
6. Information Literacy
7. Leadership
8. Civic literacy and citizenship
9. Social responsibility
10. Technology literacy
11. Initiative

Admission and Graduation Requirements

Admission requirements: There are two modes of admission into the degree programme.

Five-Year Degree Programme: prospective candidates can be admitted into Radiography programme if they have obtained minimum of five credit passes in Senior Secondary Certificate (SSC) subjects or its equivalent, which should include English Language, Mathematics, Physics, Chemistry and Biology at not more than two sittings and appropriate pass in UTME conducted by the Joint Admission and Matriculation (JAMB).

Direct Entry (DE) Admission (Four-Year Programme): Candidates for Direct Entry shall possess first degree in Physical, Biological or Basic Medical Sciences at not less than second class



lower division in addition to meeting the five credit passes in Senior Secondary Certificate subjects (or its equivalent) earlier stated, two of which must be at Advance Level. The subject can be Chemistry, Physics or Biology at not less than C grade. Candidates who passed Diploma in X-ray Technician course from accredited School of Health Technology plus 5 credit passes in English language, Chemistry, Mathematics, Physics and Biology at SSC or its equivalent are eligible for Direct Entry.

Minimum Standards for Graduation

Graduation Requirements: The programme is run in three stages:

Stage I – The student must successfully complete the first year in the basic sciences related to the programme namely, Biology, Chemistry and Physics.

Stage II – The student must successfully complete all the courses in the basic medical sciences and professional courses at the 200 level before sitting for the first Professional Examination.

Stage III – Student must be successful in the first Professional Examination before progressing to 400 level and sitting for the second Professional Examination at the 500 level.

The courses that constitute first Professional Examination are Radiographic Technique, Hospital practice and Care of Patient, Radiographic Anatomy and Physiology, Radiation Physics/Biology, Protection and Dosimetry. In addition to successful completion of Basic Medical Sciences in Anatomy, Physiology and Biochemistry.

The second Professional Examination (Part II) comprises the following courses: Radiographic Equipment, Radiographic Technique, Radiographic Imaging Process, Other Imaging Modalities – Sonography, CT and N/M, Radiotherapy and Oncology and Research Methods/Seminars. The pass mark for the professional courses shall be 50% while 40% or 45% shall be applicable to other courses as may be required in the course system. The degree shall be unclassified.

All students must meet the following criteria for graduation:

completion of 5 years of training for UTME candidates and 4 years for Direct Entry candidates; successful completion of all registered courses for the award of degree; and successful completion of all required clinical postings/placements and required number of clinical cases observed/carried out.

All competencies must be completed as outlined in the log book for training.

Evaluation

Formal examination comprising MCQ, objective, essays:

1. laboratory reports/records;
2. problem solving exercises;
3. oral presentations;
4. clinical demonstrations; and
5. planning, conduct and report of project work and research.



Global Course Structure

100 Level

| Course Code | Course Title | Unit(s) | Status | LH | PH |
|-------------|----------------------------------|-----------|--------|----|----|
| GST 111 | Communication in English | 2 | C | 15 | 45 |
| GST 112 | Nigerian Peoples and Culture | 2 | C | 30 | - |
| BIO 101 | General Biology I | 2 | C | 30 | - |
| BIO 102 | General Biology II | 2 | C | 30 | - |
| BIO 107 | General Biology Practical I | 1 | C | - | 45 |
| BIO 108 | General Biology Practical II | 1 | C | - | 45 |
| CHM 101 | General Chemistry I | 2 | C | 30 | - |
| CHM 102 | General Chemistry II | 2 | C | 30 | - |
| CHM 107 | General Chemistry Practical I | 1 | C | - | 45 |
| CHM 108 | General Chemistry Practical II | 1 | C | - | 45 |
| COS 101 | Introduction to Computer Science | 3 | C | 30 | 45 |
| MTH 101 | Elementary Mathematics I | 2 | C | 30 | - |
| PHY 101 | General Physics I | 2 | C | 30 | - |
| PHY 107 | General Physics Practical I | 1 | C | - | 45 |
| PHY 102 | General Physics II | 2 | C | 30 | - |
| PHY 108 | General Physics Practical II | 1 | C | - | 45 |
| | Total | 27 | | | |

200 Level

| Course Code | Course Title | Unit(s) | Status | LH | PH |
|-------------|---|-----------|--------|----|----|
| GST 212 | Philosophy, Logic and Human Existence | 2 | C | 30 | - |
| ENT 211 | Entrepreneurship and Innovation | 2 | C | 30 | - |
| ANA 201 | Anatomy of Upper and Lower limbs | 2 | C | 15 | 45 |
| ANA 204 | Anatomy of Thorax, Abdomen and Perineum | 2 | C | 15 | 45 |
| ANA 302 | Neuroanatomy | 2 | C | 30 | - |
| ANA 203 | General and Systemic Embryology | 2 | C | 30 | - |
| BCH 201 | General Biochemistry I (Chemistry of Biomolecules) | 2 | C | 30 | - |
| BCH 202 | Bioenergetics, Metabolism and Inborn Errors of Metabolism | 2 | C | 30 | - |
| PIO 201 | Introductory Physiology and Blood | 2 | C | 30 | - |
| PIO 214 | Introduction to Cardiovascular and Respiratory Physiology | 2 | C | 30 | - |
| PIO 204 | Introduction to Laboratory Physiology | 1 | C | - | 45 |
| RAD 201 | Basic/ Radiation Physics in Radiology | 2 | C | 30 | - |
| RAD 210 | Basic Patient Care, Hospital Practice and Professional Ethics | 2 | C | 30 | - |
| MCB 201 | Introduction to General Microbiology | 2 | C | 30 | |
| | Total | 28 | | | |



300 Level

| Course Code | Course Title | Unit(s) | Status | LH | PH |
|--------------------|--|----------------|---------------|-----------|-----------|
| GST 312 | Peace and Conflict Resolution | 2 | C | 30 | - |
| ENT 312 | Venture Creation | 2 | C | 15 | 45 |
| RAD 301 | Radiobiology, Radiation Dosimetry and Protection | 2 | C | 15 | 45 |
| RAD 302 | Physics of Cross-sectional Imaging | 2 | C | 30 | - |
| RAD 341 | Radiographic Technique I | 2 | C | 15 | 45 |
| RAD 331 | Radiographic Imaging Process I | 2 | C | 15 | 45 |
| RAD 332 | Artificial Intelligence in Radiography | 1 | C | 15 | 45 |
| RAD 381 | Radiographic Anatomy and Physiology | 2 | C | 30 | 45 |
| RAD 311 | Psychology and Medical Sociology for Radiographers | 2 | C | 30 | - |
| RAD 321 | Radiographic Equipment I | 2 | C | 15 | 45 |
| RAD 384 | Pharmacology for Medical Imaging | 2 | C | 30 | - |
| RAD 351 | Radiology Administration and Management | 1 | C | 15 | - |
| RAD 352 | Entrepreneurship/Education in Radiography | 2 | C | 30 | - |
| RAD 372 | Clinical Posting I | 3 | C | - | 135 |
| | Total | 27 | | | |

400 Level

| Course Code | Course Title | Unit(s) | Status | LH | PH |
|--------------------|---|----------------|---------------|-----------|-----------|
| COMED 491 | Biostatistics for Health Sciences | 2 | C | 30 | - |
| RAD 492 | Research Methodology | 2 | C | 30 | - |
| RAD 441 | Radiographic Technique II | 2 | C | 15 | 45 |
| RAD 442 | Ultrasound Imaging /Computerised Tomography | 2 | C | 15 | 45 |
| RAD 447 | Radio-Nuclide Imaging/Thermography/MRI | 2 | C | 30 | - |
| RAD 421 | Radiographic Equipment II | 2 | C | 30 | - |
| RAD 431 | Radiographic Imaging Process II | 2 | C | 15 | 45 |
| RAD 471 | Clinical Posting II | 3 | C | - | 135 |
| RAD 474 | Students Industrial Work Experience (SIWES) | 3 | C | - | 135 |
| RAD 482 | Radiographic Pathology | 2 | C | 30 | - |
| | Total | 22 | | | |



500 level

| Course Code | Course Title | Unit(s) | Status | LH | PH |
|--------------------|---|----------------|---------------|-----------|-----------|
| RAD 531 | Radiographic Imaging Process III (Special Topics) | 2 | C | 15 | 45 |
| RAD 521 | Radiographic Equipment III | 2 | C | 15 | 45 |
| RAD 581 | Imaging Critique/Pattern Recognition | 2 | C | 30 | - |
| RAD 591 | Research Seminar | 2 | C | 15 | 45 |
| RAD 592 | Project | 4 | C | 30 | 90 |
| RAD 544 | Radiographic Technique III | 2 | C | 15 | 45 |
| RAD 561 | Radiotherapy/Oncology I | 2 | C | 15 | 45 |
| RAD 551 | Rural Radiography | 1 | C | 15 | - |
| RAD 572 | Clinical Posting III | 4 | C | - | 135 |
| | Total | 21 | | | |

Course Contents and Learning Outcomes**100 Level****GST 111: Communication in English****(2 Units C: LH 15; PH 45)****Learning Outcomes**

At the end of this course, students should be able to:

1. identify possible sound patterns in English Language;
2. list notable Language skills;
3. classify word formation processes;
4. construct simple and fairly complex sentences in English;
5. apply logical and critical reasoning skills for meaningful presentations;
6. demonstrate an appreciable level of the art of public speaking and listening; and
7. write simple and technical reports.

Course Contents

Sound patterns in English Language (vowels and consonants, phonetics and phonology). English word classes (lexical and grammatical words, definitions, forms, functions, usages, collocations). Sentence in English (types: structural and functional, simple and complex). Grammar and Usage (tense, mood, modality and concord, aspects of language use in everyday life). Logical and Critical Thinking and Reasoning Methods (Logic and Syllogism, Inductive and Deductive Argument and Reasoning Methods, Analogy, Generalisation and Explanations). Ethical considerations, Copyright Rules and Infringements. Writing Activities: (Pre-writing, Writing, Post writing, Editing and Proofreading; Brainstorming, outlining, Paragraphing, Types of writing, Summary, Essays, Letter, Curriculum Vitae, Report writing, Note making and many others. Mechanics of writing). Comprehension Strategies: (Reading and types of Reading, Comprehension Skills, 3RsQ). Information and Communication Technology in modern Language Learning. Language skills for effective communication. Major word formation processes. Writing and reading comprehension strategies. Logical and critical reasoning for meaningful presentations. Art of public speaking and listening.



GST 112: Nigerian Peoples and Culture

(2 Units C: LH 30)

Learning Outcomes

At the end of the course, students should be able to:

1. analyse the historical foundation of the Nigerian culture and arts in pre-colonial times;
2. list and identify the major linguistic groups in Nigeria;
3. explain the gradual evolution of Nigeria as a political unit;
4. analyse the concepts of Trade, Economic and Self-reliance status of the Nigerian peoples towards national development;
5. enumerate the challenges of the Nigerian State towards Nation building;
6. analyse the role of the Judiciary in upholding people's fundamental rights;
7. identify acceptable norms and values of the major ethnic groups in Nigeria; and
8. list and suggest possible solutions to identifiable Nigerian environmental, moral and value problems.

Course Contents

Nigerian history, culture and art up to 1800 (Yoruba, Hausa and Igbo peoples and culture; peoples and culture of the ethnic minority groups). Nigeria under colonial rule (advent of colonial rule in Nigeria; Colonial administration of Nigeria). Evolution of Nigeria as a political unit (amalgamation of Nigeria in 1914; formation of political parties in Nigeria; Nationalist movement and struggle for independence). Nigeria and challenges of nation building (military intervention in Nigerian politics; Nigerian Civil War). Concept of trade and economics of self-reliance (indigenous trade and market system; indigenous apprenticeship system among Nigeria people; trade, skill acquisition and self-reliance). Social justices and national development (law definition and classification. Judiciary and fundamental rights. Individual, norms and values (basic Nigeria norms and values, patterns of citizenship acquisition; citizenship and civic responsibilities; indigenous languages, usage and development; negative attitudes and conducts. Cultism, kidnapping and other related social vices). Re-orientation, moral and national values (The 3R's – Reconstruction, Rehabilitation and Re-orientation; Re-orientation Strategies: Operation Feed the Nation (OFN), Green Revolution, Austerity Measures, War Against Indiscipline (WAI), War Against Indiscipline and Corruption(WAIC), Mass Mobilization for Self-Reliance, Social Justice and Economic Recovery (MAMSER), National Orientation Agency (NOA). Current socio-political and cultural developments in Nigeria.

BIO 101: General Principles of Biology

(2 Units C: LH 30)

Learning Outcomes

At the end of lectures in Plant Biology, students should be able to:

1. explain cells structure and organisations;
2. summarise functions of cellular organelles;
3. characterise living organisms and state their general reproduction;
4. describe the interrelationship that exists between organisms;
5. discuss the concept of heredity and evolution; and
6. enumerate habitat types and their characteristics.



Course Contents

Cell structure and organisation. functions of cellular organelles. characteristics and classification of living things. chromosomes, genes their relationships and importance. General reproduction. Interrelationships of organisms (competitions, parasitism, predation, symbiosis, commensalisms, mutualism, saprophytism). Heredity and evolution (introduction to Darwinism and Lamarckism, Mendelian laws, explanation of key genetic terms). Elements of ecology and types of habitat.

BIO: 102 General Principles of Biology II

(2 Units C: LH 30)

Learning Outcomes

At the end of the lectures in Introductory Ecology, students should be able to:

1. List the characteristics, methods of identification and classification of viruses, bacteria and fungi;
2. state the unique characteristics of plant and animal kingdoms;
3. describe ecological adaptations in the plant and animal kingdoms;
4. explain nutrition, respiration, excretion and reproduction in plants and animals; and
5. describe growth and development in plants and animals.

Course Contents

Basic characteristics, identification and classification of viruses, bacteria and fungi. A generalised survey of the plant and animal kingdoms based mainly on the study of similarities and differences in the external features. Ecological adaptations. Briefs on physiology to include nutrition, respiration, circulatory systems, excretion, reproduction, growth and development.

CHM 101: General Chemistry I

(2 Units C: LH 30)

Learning Outcomes

At the end of this course, students should be able to:

1. define atom, molecules and chemical reactions;
2. discuss the Modern electronic theory of atoms;
3. write electronic configurations of elements on the periodic table;
4. justify the trends of atomic radii, ionization energies, electronegativity of the elements based on their position in the periodic table;
5. identify and balance oxidation – reduction equation and solve redox titration problems;
6. illustrate shapes of simple molecules and hybridised orbitals;
7. identify the characteristics of acids, bases and salts, and solve problems based on their quantitative relationship;
8. apply the principles of equilibrium to aqueous systems using LeChatelier's principle to predict the effect of concentration, pressure and temperature changes on equilibrium mixtures;
9. analyse and perform calculations with the thermodynamic functions, enthalpy, entropy and free energy; and
10. determine rates of reactions and its dependence on concentration, time and temperature.



Course Contents

Atoms, molecules and chemical reaction. Chemical equation and stoichiometry. Atomic structure and periodicity. Modern electronic theory of atoms. Radioactivity. Chemical bonding. Properties of gases. Equilibria and Thermodynamics. Chemical Kinetic. Electrochemistry.

CHM 102: General Chemistry II

(2 Units C: LH 30)

Learning Outcomes

At the end of this course, students should be able to:

1. state the importance and development of organic chemistry;
2. define fullerenes and its applications;
3. discuss electronic theory;
4. determine the qualitative and quantitative of structures in organic chemistry;
5. describe rules guiding nomenclature and functional group classes of organic chemistry;
6. determine rate of reaction to predict mechanisms of reaction;
7. identify classes of organic functional group with brief description of their chemistry;
8. discuss comparative chemistry of group 1A, IIA and IVA elements; and
9. describe basic properties of Transition metals.

Course Contents

Historical survey of the development and importance of Organic Chemistry. Fullerenes as fourth allotrope of carbon, uses as nanotubules, nanostructures, nanochemistry. Electronic theory in organic chemistry. Isolation and purification of organic compounds. Determination of structures of organic compounds including qualitative and quantitative analysis in organic chemistry. Nomenclature and functional group classes of organic compounds. Introductory reaction mechanism and kinetics. Stereochemistry. The chemistry of alkanes, alkenes, alkynes, alcohols, ethers, amines, alkyl halides, nitriles, aldehydes, ketones, carboxylic acids and derivatives. The Chemistry of selected metals and non-metals. Comparative chemistry of group IA, IIA and IVA elements. Introduction to transition metal chemistry.

CHM107: Practical Chemistry I

(1 Unit C: PH 45)

Learning Outcomes

At the end of the course, students should be able to:

1. describe the general laboratory rules and safety procedures;
2. collect scientific data and correctly carrying out Chemical experiments;
3. identify the basic glassware and equipment in the laboratory;
4. identify the differences between primary and secondary standards;
5. perform redox titration;
6. recording observations and measurements in the laboratory notebooks; and
7. analyse the data to arrive at scientific conclusions.

Course Contents

Laboratory experiments designed to reflect topics presented in courses CHM 101 and CHM 102. These include acid-base titrations, qualitative analysis, redox reactions, gravimetric analysis, data analysis and presentation.



CHM 108: General Chemistry Practical II

(1 Unit C: PH 45)

Learning Outcomes

At the end of this course, the students should be able to:

1. identify the general laboratory rules and safety procedures;
2. collect scientific data and correctly carrying out Chemical experiments;
3. identify the basic glassware and equipment in the laboratory;
4. identify and carry out preliminary tests which includes ignition, boiling point, melting point, test on known and unknown organic compounds;
5. perform solubility tests on known and unknown organic compounds;
6. conduct elemental tests on known and unknown compounds; and
7. conduct functional group/confirmatory test on known and unknown compounds which could be acidic / basic / neutral organic compounds.

Course Contents

Continuation of CHM 107. Additional laboratory experiments to include functional group analysis, quantitative analysis using volumetric methods.

MTH 101: Elementary Mathematics (Algebra and Trigonometry) (2 Units C: LH 30)

Learning Outcomes

At the end of the course students should be able to:

1. explain basic definition of Set, Subset, Union, Intersection, Complements and use of Venn diagrams;
2. solve quadratic equations;
3. solve trigonometric functions;
4. identify various types of numbers; and
5. solve some problems using Binomial theorem.

Course contents

Elementary set theory; subset, union, intersection, complements, venn diagrams. Real numbers; Integers, Rational and Irrational numbers, mathematical, induction, Sequences and Series, Theory of Quadratic equations, Binomial theorem. Complex numbers; Algebra of complex numbers; the Argand Diagram. De-Moivre's theorem, nth roots of unity, Circular measure, Trigonometric functions of angles of any magnitude, addition and factor formulae.

COS 101: Introduction to Computing Sciences

(3 Units C: LH 30; PH 45)

Learning Outcomes

At the end of the course, students should be able to:

1. explain basic components of computers and other computing devices;
2. describe the various applications of computers;
3. explain information processing and its roles in the society;
4. describe the Internet, its various applications and its impact;
5. explain the different areas of the computing discipline and its specialisations; and
6. demonstrate practical skills on using computers and the internet.



Course Contents

Brief history of computing. Description of the basic components of a computer/computing device. Input/Output devices and peripherals. Hardware, software and human ware. Diverse and growing computer/digital applications. Information processing and its roles in society. The Internet, its applications and its impact on the world today. The different areas/programs of the computing discipline. The job specialisations for computing professionals. The future of computing.

Lab Work: Practical demonstration of the basic parts of a computer. Illustration of different operating systems of different computing devices including desktops, laptops, tablets, smart boards and smart phones. Demonstration of commonly used applications such as word processors, spreadsheets, presentation software and graphics. Illustration of input and output devices including printers, scanners, projectors and smartboards. Practical demonstration of the Internet and its various applications. Illustration of browsers and search engines. How to access online resources.

PHY 101: General Physics I (Mechanics)

(2 Units C: LH 30)

Learning Outcomes

At the end of the course, the student should be able to;

1. identify and deduce the physical quantities and their units;
2. differentiate between vectors and scalars;
3. describe and evaluate motion of systems on the basis of the fundamental laws of mechanics;
4. apply Newton's laws to describe and solve simple problems of motion;
5. evaluate work, energy, velocity, momentum, acceleration, and torque of moving or rotating objects;
6. explain and apply the principles of conservation of energy, linear and angular momentum;
7. describe the laws governing motion under gravity; and
8. explain motion under gravity and quantitatively determine behaviour of objects moving under gravity.

Course Contents

Space and time. Units and dimension, Vectors and Scalars. Differentiation of vectors: displacement, velocity and acceleration. Kinematics. Newton laws of motion (Inertial frames, Impulse, force and action at a distance, momentum conservation). Relative motion. Application of Newtonian mechanics. Equations of motion. Conservation principles in physics. Conservative forces. Conservation of linear momentum. Kinetic energy and work. Potential energy. System of particles. Centre of mass. Rotational motion: Torque, vector product, moment, rotation of coordinate axes and angular momentum. Polar coordinates. Conservation of angular momentum. Circular motion. Moments of inertia. gyroscopes and precession. Gravitation: Newton's Law of Gravitation. Kepler's Laws of Planetary Motion. Gravitational Potential Energy. Escape velocity. Satellites motion and orbits.



PHY 102: General Physics II (Electricity & Magnetism)**(2 Units C: LH 30)****Learning Outcomes**

At the end of this course, the student should be able to:

1. describe the electric field and potential, and related concepts, for stationary charges;
2. calculate electrostatic properties of simple charge distributions using Coulomb's law, Gauss's law and electric potential;
3. describe and determine the magnetic field for steady and moving charges;
4. determine the magnetic properties of simple current distributions using Biot-Savart and Ampere's law;
5. describe electromagnetic induction and related concepts, and make calculations using Faraday and Lenz's laws;
6. explain the basic physical of Maxwell's equations in integral form;
7. evaluate DC circuits to determine the electrical parameters; and
8. determine the characteristics of ac voltages and currents in resistors, capacitors, and Inductors.

Course Contents

Forces in nature. Electrostatics; electric charge and its properties, methods of charging. Coulomb's law and superposition. electric field and potential. Gauss's law. Capacitance. Electric dipoles. Energy in electric fields. Conductors and insulators, current, voltage and resistance. Ohm's law and analysis of DC circuits. Magnetic fields. Lorentz force. Biot-Savart and Ampère's laws. magnetic dipoles. Dielectrics. Energy in magnetic fields. Electromotive force. Electromagnetic induction. Self and mutual inductances. Faraday and Lenz's laws. Step up and step-down transformers: Maxwell's equations. Electromagnetic oscillations and waves. AC voltages and currents applied to inductors, capacitors, resistance, and combinations.

PHY 107: General Practical Physics I**(1 Unit C: PH 45)****Learning Outcomes**

At the end of this course, the student should be able to;

1. conduct measurements of some physical quantities;
2. make observations of events, collect and tabulate data;
3. identify and evaluate some common experimental errors;
4. plot and analyse graphs; and
5. draw conclusions from numerical and graphical analysis of data.

Course Contents

This introductory course emphasises quantitative measurements, the treatment of measurement errors and graphical analysis. A variety of experimental techniques should be employed. The experiments include studies of meters, the oscilloscope, mechanical systems, electrical and mechanical resonant systems, light, heat, viscosity etc., covered in PHY 101 and PHY 102. However, emphasis should be placed on the basic physical techniques for observation, measurements, data collection, analysis and deduction.



PHY 108: General Practical Physics II

(1 Unit C: PH 45)

Learning Outcomes

At the end of this course, the student should be able to:

1. conduct measurements of some physical quantities;
2. make observations of events, collect and tabulate data;
3. identify and evaluate some common experimental errors;
4. plot and analyse graphs;
5. draw conclusions from numerical and graphical analysis of data; and
6. prepare and present practical reports.

Course Contents

This practical course is a continuation of PHY 107 and is intended to be taught during the second semester of the 100 level to cover the practical aspect of the theoretical courses that have been covered with emphasis on quantitative measurements. The treatment of measurement errors, and graphical analysis. However, emphasis should be placed on the basic physical techniques for observation, measurements, data collection, analysis and deduction.

200 Level Courses

GST 212: Philosophy, Logic and Human Existence

(2 Units C: LH 30)

Learning Outcomes

A student who has successfully gone through this course should be able to:

1. enumerate the basic features of philosophy as an academic discipline;
2. identify the main branches of philosophy & the centrality of logic in philosophical discourse;
3. describe the elementary rules of reasoning;
4. distinguish between valid and invalid arguments;
5. think critically and assess arguments in texts, conversations and day-to-day discussions;
6. critically assess the rationality or otherwise of human conduct under different existential conditions;
7. develop the capacity to extrapolate and deploy expertise in logic to other areas of knowledge, and
8. guide his or her actions, using the knowledge and expertise acquired in philosophy and logic.

Course Contents

Scope of philosophy; notions, meanings, branches and problems of philosophy. Logic as an indispensable tool of philosophy. Elements of syllogism, symbolic logic— the first nine rules of inference. Informal fallacies, laws of thought, nature of arguments. Valid and invalid arguments, logic of form and logic of content — deduction, induction and inferences. Creative and critical thinking. Impact of philosophy on human existence. Philosophy and politics, philosophy and human conduct, philosophy and religion, philosophy and human values, philosophy and character molding and many others.



ENT 211: Entrepreneurship and Innovation

(2 Units C: LH 30)

Learning Outcomes

At the end of this course, students should be able to:

1. explain the concepts and theories of entrepreneurship, intrapreneurship, opportunity seeking, new value creation, and risk taking;
2. state the characteristics of an entrepreneur;
3. analyse the importance of micro and small businesses in wealth creation, employment, and financial independence;
4. engage in entrepreneurial thinking;
5. identify key elements in innovation;
6. describe stages in enterprise formation, partnership and networking including business planning;
7. describe contemporary entrepreneurial issues in Nigeria, Africa and the rest of the world; and
8. state the basic principles of e-commerce.

Course Contents

Concept of Entrepreneurship (Entrepreneurship, Intrapreneurship/Corporate Entrepreneurship,). Theories, Rationale and relevance of Entrepreneurship (Schumpeterian and other perspectives, Risk-Taking, Necessity and opportunity-based entrepreneurship and Creative destruction). Characteristics of Entrepreneurs (Opportunity seeker, Risk taker, Natural and Nurtured, Problem solver and change agent, Innovator and creative thinker). Entrepreneurial thinking (Critical thinking, Reflective thinking, and Creative thinking). Innovation (Concept of innovation, Dimensions of innovation, Change and innovation, Knowledge and innovation). Enterprise formation, partnership and networking (Basics of Business Plan, Forms of business ownership, Business registration and Forming alliances and joint ventures). Contemporary Entrepreneurship Issues (Knowledge, Skills and Technology, Intellectual property, Virtual office, Networking). Entrepreneurship in Nigeria (Biography of inspirational Entrepreneurs, Youth and women entrepreneurship, Entrepreneurship support institutions, Youth enterprise networks and Environmental and cultural barriers to entrepreneurship). Basic principles of e-commerce.

ANA 201: Anatomy of Upper and Lower Limbs

(2 Units: C: LH 15; PH 45)

Learning Outcomes

At the end of this course, the students should be able to:

1. define fundamental anatomical terminology and discuss the anatomical position;
2. describe the anatomy of the musculoskeletal system, including the axial skeleton; appendicular skeleton, appendicular and axial muscles, and arthrology;
3. describe the general features of the bones of the upper and lower limbs;
4. identify the major muscles of the upper and lower limbs;
5. explain the types and structure of the joints of the upper and lower limbs;
6. correlate between the attachment of the muscles and their functions on the different joints;
7. identify the major nerves of the upper and lower limbs;
8. describe the functional components of each of the major nerves and its distribution;
9. identify and describe the course of the major superficial veins of the upper and lower limbs; and
10. name the major arteries of the upper and lower limbs.



Course Contents

Descriptive terms, plans and terms of relationship of the human body, terms of comparison, attachment of muscles, types of muscles, movements of joints. Osteology, principles of kinesiology, general organization of body system. Cutaneous innervation of the upper limb; pectoral region; breast; axilla; shoulder region; arm and cubital fossa; flexor compartment of forearm; extensor compartment of forearm; hand; venous and lymphatic drainage of the upper limb. Applied anatomy of nerves; blood supply of the upper limb. Cutaneous innervation of the lower limb; femoral triangle; adductor canal and medial side of the thigh; gluteal region; back of the thigh, popliteal fossa; extensor compartment of the leg and dorsum of the foot; peroneal and flexor compartment of the leg; sole of the foot, arches of the foot; mechanism of walking; venous and lymphatic drainage of the lower limb; applied anatomy of the nerves and blood supply to the lower limb.

ANA 202: Anatomy of Thorax, Abdomen, Pelvis & Perineum (2 Units C: LH 15; PH 45)

Learning Outcomes

At the end of this course, the students should be able to:

1. identify the bones and bony markings of the thorax, abdomen, pelvis and perineum;
2. list the nine regions and four quadrants and the principal organs and structures that lie deep to them and which can be palpated in those regions;
3. describe the muscular components of the anterior abdominal wall, blood supply and innervation of the anterior abdominal wall;
4. identify the arteries, veins and lymphatics of the thorax, abdomen, pelvis and perineum; be able to list the main branches of the aorta and their territories; and describe the disposition of the main veins in the abdomen;
5. describe the parts, position, vertebral levels and surface markings of the stomach and duodenum as well as the position, vertebral levels and surface markings of the pancreas, spleen, liver and gall bladder;
6. describe the greater and lesser omenta and the lesser sac;
7. describe the disposition of the jejunum and ileum; describe the surface anatomy of the caecum, ascending colon, transverse colon, descending colon and sigmoid colon;
8. describe the anatomy of the pelvic diaphragm, its midline raphe, perineal body, attachment points and the structures passing through it in males and females;
9. describe the anatomy of the ischio-anal fossa;
10. describe the anatomy and relations of the ovary, uterine tubes, uterus, cervix and vagina, including their peritoneal coverings;
11. describe the anatomy and neurovascular supply of the clitoris, vulva and vagina; the anatomy of the urogenital diaphragm and perineal 'pouches';
12. describe the origin, course and distribution of the pudendal nerves and the sites of pudendal nerve block;
13. describe the lymphatic drainage of the foregut, pelvic and perineal organs;



Course Contents

Introduction to the trunk; thoracic cage; intercostal space; thoracic cavity; pleural cavities; lungs; mediastinum general; anterior & superior mediastinum; middle; mediastinum – heart and pericardium; heart – applied anatomy; posterior mediastinum. General anatomy of abdomen and abdominal regions; anterior abdominal wall muscles; inguinal canal – inguinal and femoral hernias; peritoneal cavity and spaces; abdominal oesophagus, stomach, duodenum, spleen, small intestine, large intestine, appendix; portal venous system; portocaval anastomoses; liver and gallbladder. Pancreas and biliary apparatus; kidneys, suprarenal glands, and ureters; diaphragm; posterior abdominal wall; aorta and inferior vena cava; posterior abdominal wall muscles; lumbosacral plexus; bony and ligamentous pelvis; pelvic diaphragm (floor); male reproductive organs; female reproductive organs; male and female external genitalia; perineum; rectum and anal canal; pelvic blood vessels; abdomino-pelvic nervous system.

ANA 203: General and Systemic Embryology

(2 Units C: LH 30)

Learning Outcomes

At the end of this course, the students should be able to:

1. explain how the embryo form is from the zygote;
2. discuss the role of cleavage and gastrulation in animal development;
3. demonstrate; understanding of embryology and significance of prenatal diagnostic methods;
4. describe structural features of primordia in tissue and organs at different developmental stages;
5. define risk periods in histo- and organogenesis; and
6. analyse the most often observed developmental anomalies.

Course Contents

Spermatogenesis, oogenesis; ovarian follicles; ovulation; corpus luteum; menstruation; uterine cycle; hormonal control of uterine cycle; fertilization; cleavage; implantation; reproductive technologies-IVF/surrogacy/embryo transfer; embryo manipulation & potency/twinning; molecular embryology and transgenesis; gastrulation; notochord, neurulation; derivatives of the germ layers; folding of the embryo; fetal membranes; placenta; development of limbs and teratology. Growth and perinatology; congenital malformations – general introduction. The cardiovascular system, skin, structure of the nails and hair. Macrophagic system; cellular immunology; lymphoid organs; glands – endocrine and exocrine. Respiratory system. Digestive system. Urinary and genital systems. Electron micrograph studies of each organ.

ANA 203: Neuroanatomy

(2 Units C: LH 30)

Learning Outcomes

At the end of this course the students should be able to:

1. describe the anatomy of the central and peripheral nervous systems;
2. gain an overview of the topography and structural organisation of the brain and spinal cord;
3. describe the basic features of development of the nervous system and to understand how and why common malformations occur in the nervous system;
4. explain the ultrastructure of neurons and glia and the major cytoarchitectural features of the brain and spinal cord;
5. describe the blood supply and venous drainage of the nervous system



6. identify the major features of the brain and spinal cord using prosected specimens, models and cross-sectional images; and
7. describe the structural and functional relationships between these structures and to apply this knowledge to further research and clinical studies.

Course Contents

Neuroembryology; introduction to the central nervous system; spinal cord morphology; spinal cord-tracts; lower medulla-pyramids; decussation, tubercles; upper medulla-olive, pons-basis pontis and middle cerebellar penduncle; pons tegmentum; midbrain-tectum; midbrain-tegmentum; cerebellum; diencephalon-thalamus; diencephalon-hypothalamus; epithalamus, subthalamus; ascending pathways and descending pathways, ventricles; pyramidal system; cerebral hemispheres, sulci and gyri, internal structure of cerebrum, basal ganglia; cortex-cytoarchitectonics, brodmann areas, limbic system blood supply to the brain and spinal cord. Applied Anatomy.

PIO 201: Introductory Physiology and Blood

(2 Units C: LH 30)

Learning Outcomes

At the end of this course, the students should be able to:

1. describe the composition of a cell membrane;
2. explain how a potential difference across a membrane will influence the distribution of a cation and an anion;
3. describe how transport rates of certain molecules and ions are accelerated by specific membrane transport proteins;
4. distinguish between active (primary and secondary) transport, facilitated diffusion, and passive diffusion based on energy source and carrier protein involvement;
5. identify the mechanisms and role of selective transporters for amino acids, neurotransmitters, nutrients, etc.;
6. explain the general concepts of homeostasis and the principles of positive and negative feedback in physiological systems;
7. identify the site of erythropoietin production, the stimulus for its release, and the target tissue for erythropoietin action;
8. discuss the normal balance of red blood cell synthesis and destruction, including how imbalances in each lead to anemia or polycythemia;
9. list and differentiate the various types of leukocytes;
10. describe the role of thrombocytes in haemostasis; and
11. list clotting factors and discuss the mechanism of anti-coagulants.

Course Contents

Introduction and history of physiology. Structure and functions of cell membranes. Transport process. Special transport mechanism in amphibian bladder, kidney, gall bladder, intestine, astrocytes and exocrine glands. Biophysical principles. Homeostasis and control systems including temperature regulation. Biological rhythms. Composition and functions of blood. Haemopoiesis. WBC and differential count. Plasma proteins Coagulation, fibrinolysis and platelet functions. Blood groups – ABO system – Rh system. Blood transfusion – indication for collection and storage of blood, hazards of blood transfusions. Reticulo- endothelial system. Immunity and immunodeficiency disease and HIV.



PIO 214: Introduction to Cardiovascular and Respiratory Physiology (2 Units C; LH 30)

Learning Outcomes

At the end of this course, the students should be able to:

1. state Starling's Law of the Heart and describe the application of the Law in keeping the output of the left and right ventricles equal;
2. describe how ionic currents contribute to the four phases of the cardiac action potential;
3. explain the ionic mechanism of pacemaker automaticity and rhythmicity, and identify cardiac cells that have pacemaker potential and their spontaneous rate;
4. identify neural and humoral factors that influence their rate;
5. describe the various phases of ventricular systole and ventricular diastole;
6. describe the timing and causes of the four heart sounds;
7. explain why the ECG tracing looks different in each of the 12 leads;
8. explain the principles underlying cardiac output measurements using the Fick principle, dye dilution, and thermodilution methods;
9. list the factors that shift laminar flow to turbulent flow;
10. describe the relationship between velocity, viscosity, and audible events, such as murmurs and bruits;
11. describe how arterial systolic, diastolic, mean, and pulse pressure are affected by changes in a) stroke volume, b) heart rate, c) arterial compliance, and d) total peripheral resistance;
12. define the Starling equation and discuss how each component influences fluid movement across the capillary wall;
13. list the anatomical components of the baroreceptor reflex;
14. explain three positive feedback mechanisms activated during severe haemorrhage that may lead to circulatory collapse and death;
15. define compliance and identify two common clinical conditions in which lung compliance is higher or lower than normal;
16. list the factors that determine total lung capacity, functional residual capacity, and residual volume;
17. define surface tension and describe how it applies to lung mechanics, including the effects of alveolar size and the role of surfactants;
18. explain how the shape of the oxyhemoglobin dissociation curve influences the uptake and delivery of oxygen;
19. list the forms in which carbon dioxide is carried in the blood; and
20. identify the regions in the central nervous system that play important roles in the generation and control of normal respiration.



Course Contents

The heart; events of the cardiac cycle cardiac output and control of cardiac contractility. Cardiac electrophysiology. Properties of cardiac muscle. Cardiac cycle. Cardiac output - measurement and control. Haemodynamics of circulation. Arterial blood pressure and its regulation. Cardiovascular reflexes. Peripheral resistance and local control of the circulation. Regional blood flow. Cardiovascular changes in exercise, haemorrhage and shock. Respiratory Physiology – Functions of upper respiratory tract. Mechanics of respiration including compliance, surfactant, lung volume and capacities; pulmonary gas exchange. Blood gas transport. Pulmonary function tests; Nervous and chemical control of respiration. Response to hypoxia, high altitude and exercise. Artificial respiration.

PIO 204: Introduction to Laboratory Physiology/Neurophysiology (2 Units C: LH 15; PH 45)

Learning Outcomes

At the end of this course, the students should be able to:

1. acquaint with proper handling of laboratory equipment;
2. dissects laboratory animals and mount an isolated organs for a specific experiment;
3. use human subjects for some of the experiments like blood grouping and many others;
4. take recordings of an experiment and interpret the results accordingly;
5. identify on a diagram of a motor neuron, the following regions: dendrites, axon, axon hillock, soma, and an axodendritic synapse;
6. identify on a diagram of a primary sensory neuron, the following regions: receptor membrane, peripheral axon process, central axon process, soma, sensory ganglia;
7. describe the functional role of myelin in promoting saltatory conduction, contrasting the differences between the CNS and PNS;
8. describe how inhibitory and excitatory post-synaptic potentials can alter synaptic transmission; and
9. list the characteristics of a classical neurotransmitter.

Course Contents

Laboratory sessions on basic physiology experiments, especially those related to the frog sciatic nerve, smooth muscles and blood physiology. Classification of Nerve fibres. Membrane potentials, Nerve generation and conduction of impulses. Synapses and synaptic transmission. Functional organisation of CNS, autonomic neurotransmitters and autonomic effects.

BCH 201: General Biochemistry I

(2 Units C: LH 30)

Learning Outcomes

At the end of the lectures, students should be able to:

1. explain the structure of different macromolecules in biological system;
2. identify types of chemical reactions involving these macromolecules;
3. explain the various methods of isolation of these macromolecules;
4. estimate the effects of acids and alkalis on the macromolecules;
5. describe how to purify the macromolecules; and
6. discuss how to quantify the various macromolecules.



Course Contents

Introductory chemistry of amino acids; their properties, reactions and biological functions. Classification of amino acids: neutral, basic and acidic; polar and non-polar; essential and non-essential amino acids. Peptides. Introductory chemistry and classification of proteins. Biological functions of proteins. Methods of their isolation, purification and identification. Primary, secondary, tertiary and quaternary structures of proteins. Basic principles of tests for proteins and amino acids. Introductory chemistry of carbohydrates, lipids and nucleic acids. Nomenclature of nucleosides, and nucleotides; effects of acid and alkali on hydrolysis of nucleic acids.

BCH 202: General Biochemistry II, Metabolism and Bioenergetics (2 Units C: LH 30)

Learning Outcomes

At the end of this course, the students should be able to:

1. describe the structure of the cell including its components;
2. discuss the interrelationship between different organelles of the cell;
3. recognise the differences between plant and animal cells;
4. isolate the various organelles of both plant and animal cells; and
5. describe the influence of hydrogen ion concentration on cellular function.

Course Contents

The cell theory. Structures and functions of major cell components. Cell types, constancy and diversity. Cell organelles of prokaryotes and eukaryotes. Chemical composition of cells. Centrifugation; Methods of cell fractionation. Structure, function and fractionation of extra-cellular organelles. Water, total body water and its distribution. Regulation of water and electrolyte balance. Disorder of water and electrolyte balance. Acidity and alkalinity, pH and pK values and their effects on cellular activities.

RAD 201: Basic Physics in Radiology

(2 Units C: LH 30)

Learning Outcomes

At the end of this course, the students should be able to:

1. explain the basic physical processes underpinning Radiography;
2. apply physical principles in understanding and practice of diagnostic medical imaging devices and procedures;
3. identify the sources of radiation and mechanisms of their production for both ionizing and non-ionizing;
4. describe its physical characteristics and interaction with matter especially biological systems; and
5. explain the application of radiation in medicine, biology and industry.



Course Contents

Fundamental and derived quantities and units. Equation of motion, concepts of force work energy, power, momentum energy conservation. Fields, Electrostatics, Physical Factors governing capacitance, charging and discharging capacitor and their uses in Radiological Equipment, basic x-ray circuitry and many others. Basic computer Architecture and peripherals. Electromagnetic and Electromagnetic induction, Lenz laws, Mutual and Self-induction. principles and construction of the transformer. Transformer Parameters, uses of mutual and self-inductance in autotransformers and High Tension transformers, AC theory and sources of electric power supply. current electricity, solid state devices, Rectification, principles and uses in Radiology, concept of energy. Atomic structure, Bohr's atom elements of quantum mechanics applied to atom, Heisenberg's uncertainty theory, de Broglie wavelength, Schrodinger equation and configuration of atoms. The nuclear structure and models, nuclear instability and radioactivity, Wave and Quantum methods of Energy Transfer and applications in radiology, production of X-rays, Radioactivity and radioactive decay, half-life, counters, units of activity and measurement, K-capture. The atom, isotopes, isobars, isomers, nuclear binding energies, and inverse square law, effects of filtration. Luminescence and their applications. Interaction of radiation (emr and particulate radiation) with matter and their applications in medical imaging and radiotherapy. Attenuation of radiation shielding and filtration.

RAD 210: Basic Patient care, Hospital Practice and Professional Ethics (2 Units C: LH 15; PH 45)

Learning Outcomes

At the end of this, course the students should be able to:

1. describe health situations classified as medical emergency;
2. explain immediate Care in emergency;
3. apply necessary measures to control infection in a healthcare environment;
4. communicate effectively with other members of the team using appropriate language;
5. report medical emergency encountered on duty;
6. take vital signs of patients;
7. carry out simple nursing procedures and emergency resuscitation of patients; and
8. practice nursing procedures in radiology they have learnt including administration of first aid, patient monitoring skills and aseptic procedures and demonstrate relevant skills.

Course Contents

Basic first Aid, Principles of Nursing, general and special preparation, General and special care, professional attitude of the Radiographer. Hygiene. Infection and Principles of Asepsis Special and Emergency Care of the Patient. Use of Hospital and Nursing Equipment. Moving and lifting. Drugs, Hospital Practice: The Radiographer in the hospital team. Medico-Legal aspects. Health Services Organisation and Management. Professional Ethics. Nursing procedures; Understanding the recipients of patient's care; Concepts and basic care of patients; emergency situations and first aid treatment. Principles of asepsis and infection. Assessment of vital signs. Documentation and Reporting. Hospital posting weekly for ward/clinical/hospital experience in nursing/care of patients. Nursing Posting to familiarise themselves with the use of some basic Hospital and Nursing Equipment.

Posting for twelve weeks to recognised and relevant placement areas of their choice during the industrial training. Continuous assessment of students will be undertaken jointly by their industry-



based supervisors, ITF officials and institutional supervisors. Presentation of a seminar on major duties performed and skills acquired during the training.

MCB 201: Medical Microbiology

(2 Units C: LH 30)

Learning Outcomes

At the end of this, course the students should be able to:

1. identify microorganisms associated with disease processes and the need for infection control measures in radiography procedures; and
2. identify common vectors of pyrogens in the equipment and accessories use for radiographic examinations.

Course Contents

Introduction to Medical Microbiology. Basic concepts and terminologies. infection and disease pathogenicity and virulence, immunity, hypersensitivity, latency and communicability. Pathogenic properties of bacteria: invasiveness, toxigenicity and exotoxins, virulence properties. Host defense mechanisms: skin and mucous membrane barriers, phagocytic defense and inflammation, bacterial infection. The pathogenicity, morphology and cultural characteristics of certain groups of bacteria. Gram-positive bacteria – bacillus, clostridium, staphylococcus and streptococcus; gram-negative bacteria – the family enter bacteria, Neisseria, pseudomonas and vibrio; mycotic infection, types of mycoses. The morphology, laboratory diagnosis and treatment of disease caused by certain groups of fungi to include aspergillus, blastomyces, candida, cryptococcus, histoplasma, sporotrichum and yeasts; viral infections: classification of viruses, distinctive properties of viruses, method for the diagnosis of viral infections.

300 Level

GST 312: Peace and Conflict Resolution

(2 Units C: LH 30)

Learning Outcomes

At the end of the course, students should be able to:

1. analyse the concepts of peace, conflict and security;
2. list major forms, types and root causes of conflict and violence;
3. differentiate between conflict and terrorism;
4. enumerate security and peace building strategies; and
5. describe roles of international organisations, media and traditional institutions in peace building.



Course Contents

Concepts of Peace, Conflict and Security in a multi-ethnic nation. Types and Theories of Conflicts: Ethnic, Religious, Economic, Geo-political Conflicts; Structural Conflict Theory, Realist Theory of Conflict, Frustration-Aggression Conflict Theory. Root causes of Conflict and Violence in Africa: Indigene and settlers Phenomenon; Boundaries/boarder disputes; Political disputes; Ethnic disputes and rivalries; Economic Inequalities; Social disputes; Nationalist Movements and Agitations; Selected Conflict Case Studies – Tiv-Junkun; Zango Kartaf, Chieftaincy and Land disputes and many others. Peace Building, Management of Conflicts and Security: Peace & Human Development. Approaches to Peace & Conflict Management --- (Religious, Government, Community Leaders and many others). Elements of Peace Studies and Conflict Resolution: Conflict dynamics assessment Scales: Constructive & Destructive. Justice and Legal framework: Concepts of Social Justice; The Nigeria Legal System. Insurgency and Terrorism. Peace Mediation and Peace Keeping. Peace & Security Council (International, National and Local levels) Agents of Conflict resolution – Conventions, Treaties Community Policing: Evolution and Imperatives. Alternative Dispute Resolution, ADR. Dialogue b). Arbitration, c). Negotiation d). Collaboration and many others. Roles of International Organisations in Conflict Resolution. (a). The United Nations, UN and its Conflict Resolution Organs. (b). The African Union & Peace Security Council (c). ECOWAS in Peace Keeping. Media and Traditional Institutions in Peace Building. Managing Post-Conflict Situations/Crisis: Refugees. Internally Displaced Persons, IDPs. The role of NGOs in Post-Conflict Situations/Crisis.

ENT 312: Venture Creation

(2 Units C: LH 15; PH 45)

Learning Outcomes

At the end of this course, students, through case study and practical approaches, should be able to:

1. describe the key steps in venture creation;
2. spot opportunities in problems and in high potential sectors regardless of geographical location;
3. state how original products, ideas, and concepts are developed;
4. develop business concept for further incubation or pitching for funding;
5. identify key sources of entrepreneurial finance;
6. implement the requirements for establishing and managing micro and small enterprises;
7. conduct entrepreneurial marketing and e-commerce;
8. apply a wide variety of emerging technological solutions to entrepreneurship; and
9. appreciate why ventures fail due to lack of planning and poor implementation.

Course Contents

Opportunity Identification (Sources of business opportunities in Nigeria, Environmental scanning, Demand and supply gap/unmet needs/market gaps/Market Research, Unutilised resources, Social and climate conditions and Technology adoption gap). New business development (business planning, market research). Entrepreneurial Finance (Venture capital, Equity finance, Micro finance, Personal savings, Small business investment organisations and Business plan competition). Entrepreneurial marketing and e-commerce (Principles of marketing, Customer Acquisition & Retention, B2B, C2C and B2C models of e-commerce, First Mover Advantage, E-commerce business models and Successful E-Commerce Companies,). Small Business Management/Family Business: Leadership & Management, Basic book keeping, Nature of family business and Family Business Growth Model. Negotiation and Business communication (Strategy



and tactics of negotiation/bargaining, Traditional and modern business communication methods). Opportunity Discovery Demonstrations (Business idea generation presentations, Business idea Contest, Brainstorming sessions, Idea pitching). Technological Solutions (The Concept of Market/Customer Solution, Customer Solution and Emerging Technologies, Business Applications of New Technologies - Artificial Intelligence (AI), Virtual/Mixed Reality (VR), Internet of Things (IoTs), Blockchain, Cloud Computing, Renewable Energy and many others. Digital Business and E-Commerce Strategies).

RAD 301: Radiobiology, Radiation Dosimetry and Protection (2 Units C: LH 15; PH 45)

Learning Outcomes

At the end of this course, the students should be able to:

1. demonstrate clarity in communicating the biological basis of radiation protection;
2. describe international standards and practices for safety in all applications of radiation for medicine and industry. Students should carry out measurements using radiation dosimetry equipment;
3. describe principles of operation of radiation doseimeters; and
4. apply principle of radiation protection in radiology and other settings.

Course Contents

Cell theory and genetic apparatus, radiation chemistry, effect of radiation on DNA molecules, amino acid, protein and many others, cellular damages, survival curves. Theories of Biological effects of radiation, short and long term effect (stochastic and non-stochastic, radio sensitivity and Modifiers, post irradiation clinic events, organ pathology syndromes, evidence from Hiroshima and Nagasaki. Target theory and lethal Dose. Measurement of radiation and their units/instrumentation, units of radiation measurement. Role of International Committee on Radiological protection, Radiation dosimetry and instrumentation. The purpose and scope of radiation protection. Systems of dose limitation. Radiological design and materials, Personnel monitoring.

RAD 302: Physics of Cross-sectional Imaging

(2 Units C; LH 30)

Learning Outcomes

At the end of this course, the students should be able to:

1. identify the similarities and differences between CT, MRI, U/S, and the underlying physical processes that achieve sectional imaging; and
2. describe the instrumentation and operation of equipment used for sectional imaging

Course Contents

Principles of CT : X ray projection, attenuation and acquisition of transmission profiles. The linear attenuation coefficient , the density of the material and the photon energy, beer's law, Hounsfield units, Gantry and table , X-ray tube and generator, collimation and filtration, detectors, image reconstruction and processing. Basic physics of ultrasound: The nature of sound waves and characteristics of ultrasound, propagation in tissues, piezoelectricity, transducers and beam shapes. Doppler ultrasound physics. Components of A, B, M mode and real-time scanners, measurement of size, scan converters and processing. Pulsed and continuous wave Doppler measurements and Imaging, duplex scanners, 2D echo, ultrasound bone densitometry. MRI



physics: Protons, Alignments, Precession, Larmor frequency, Precession, frequency, Gyromagnetic constant, Vectors, Phase and Frequency, RF Pulse, T1 Relaxation, T2 Relaxation, TE and TR, Spatial encoding, K-Space.

RAD 341: Radiography Techniques I

(2 Units C: LH 15; PH 45)

Learning Outcomes

At the end of this course, the students should be able to:

1. explain the terminologies, projections and accessories required to carry out x-ray investigations for the upper and lower limbs;
2. describe patient preparations, radiation protection and exposure factors consistent with production of high quality radiographs;
3. state the indications, projections, exposure factors and safety precautions for carrying out x-ray investigations of the skull;
4. describe the procedures involving contrast media, excretory system and obstetrics and gynaecology; and
5. explain the radiation protection and allergic reactions/risks associated with the procedures.

Course Contents

Introduction to Radiography. Principles of Image formation, Factors affecting image quality. Radiation Protection in a clinical setting. Appropriate technique presentation format. Identification and preparation of the patient for the radiographic examination of the upper extremity: Fingers, thumb, hand and many others. Shoulder girdle and thorax. Radiography of the skull, Dental Radiography, skeletal surveys; plain Radiography of the viscera and soft tissue. Accident and emergency Radiography. Introduction to investigations involving contrast media Pharmacology-Radiography. The contrast examination of the gastrointestinal system, excretory system, Obstetric and Gynaecological examination. Sialography, operating theatre techniques.,

RAD 331: Radiographic Imaging Process I

(2 Units C: LH 15; PH 45)

Learning Outcomes

At the end of this course, the students should be able to:

1. describe the physical and chemical processes involved in x-ray image formation, the structure of image receptor and care of accessory equipment; and
2. describe the structure and construction of image receptors and explain their classifications.

Course Contents

Photographic principles, X-ray film materials and structure. The Radiographic image, Latent image formation, Fluorescence and its application in Radiography. Intensifying screens, X-ray film cassettes, structure and care. Cassette function tests. Chemistry of processing solutions, hazards, sensitometry, storage of X-ray films. Identification and presentation of Radiographs; viewing of Radiographs. Processing – manual and automatic silver recovery.



RAD 332: Artificial Intelligence in Radiography

(2 Units C: LH 15; PH 45)

Learning Outcomes

At the end of this course, the students should be able to:

1. explain the concept of artificial intelligence in assisting processes and procedures;
2. describe the scenarios that can be automated in Radiography; and
3. articulate clearly how AI can be used in patient documentation, image acquisition, processing, display and extraction of diagnostic information.

Course Contents

Introduction to artificial intelligence: understanding natural languages, knowledge representation, expert systems (CT Scan, MRI, Ultrasonography and many others, Pattern recognition, Medical Image Analysis, image Segmentation, registration, visualisation, computing. Deterministic versus statistical models, global versus local representations of appearances, Neural networks and texture analysis. Principles of mathematical modelling of biological systems, computer algorithms and extraction of qualitative information/automations of systems and processes Deep learning and Machine learning in imaging. Applications of AI in Radiography as it affects patient documentation and data management, Image acquisition, processing, interpretation and storage/retrieval.

RAD 381: Radiographic Anatomy and Physiology I

(2 Units C: LH 15; PH 45)

Learning Outcomes

At the end of this course, the students should be able to:

1. relate the anatomy of the various parts of the body learnt with the appearances on radiographs for both plain and contrast studies;
2. identify and differentiate appearances in different modalities eg u/s MRI and many others;
3. recognise normal, pathological, morphological and functional changes on radiographs caused by disease entities covering major organs and systems of the body; and
4. explain the basis for additional projections during imaging.

Course Contents

Conventional and contrast Radiographic Anatomy of the system. Anatomy applied to ultrasound and nuclear medicine. Surface anatomy and cross- sectional anatomy. Identification and recognition of normal and pathological changes in anatomical structures and physiological processes. Basic manifestations and presentations of various pathological conditions and diseases entities on radiographs, ultrasound, CT and MR images covering the major organs and systems of the body.

RAD 311: Psychology and Medical Sociology for Radiography Students (2 Units C: LH 30)

Learning Outcomes

At the end of this course, the students should be able to:

1. describe altered behavioural pattern of patients due to ill health;
2. demonstrate skills on how to manage their emotions and their relations professionally to ensure high quality patient care; and



3. explain the holistic nature of man and social interactions that affect health in normalcy and in sickness.

Course Contents

The Psychology of the sick patient; management of children, the elderly, the disabled, potentially violent patients, and patients in terminal stages of disease. Communication with and general care of patient's relatives. Professional attitude of the Radiologic Scientist's relationship with staff; acceptance of responsibility for care of patient; motivation and emotional adjustment.

RAD 321: Radiographic Equipment I

(2 Units C: LH 15; PH 45)

Learning Outcomes

At the end of this course, the students should be able to:

1. describe electrical supply requirements for various types of x-ray tubes and instruments for controlling and monitoring these parameters in the production of x-rays; and
2. explain the construction and operation of X-ray tubes- both stationary and rotating anode.

Course Contents

Mains supply, Basic Principles of Generators including Falling load generators and frequency multipliers. Control and stabilising equipment. High tension circuits, Meters, Switches and circuit breakers.

RAD 384: Pharmacology for Medical Imaging

(2 Units C: LH 30)

Learning Outcomes

At the end of this course, the students should be able to:

1. identify the range of iodinated contrast agents used in medical imaging and demonstrate the ability to choose the right option for each procedure including appropriate response in case of allergic reactions;
2. explain requirements and need for a contrast agent for sonography, their physical properties;
3. differentiate between microbubble and other types of sonographic contrast agents; and
4. explain the nature and types of drugs, routes of administration, pharmacokinetic and side effects particularly of those used in radiology.

Course Contents

Iodinated contrast media. High osmolality. Low osmolality. Radio pharmaceuticals. MRI contrast media. CT contrast media. Ultrasound contrast media. Allergy and contrast media reactions. Air or negative contrast media. Barium and positive contrast medium. Double contrast media. Origin and sources of Drugs; Routes of Administration of Drugs; Pharmacokinetics; Absorption of Drugs; Excretion of Drug; Drug Toxicity, Adverse drug Reactions; Drug Interactions; Cholinergic and adrenergic; Vomiting – Antiemetic; Constipation – purgatives; H₂ receptor antagonists; Oxygen therapy, Bronchodilator Drugs; Asthma, Cough Suppressants; Respiratory Stimulants; Anticoagulants Heparin, Fibrinolysis; Vasodilator; Diuretics; renal failure; Immunity; Major Features of Malignant Disease; Principles of Cancer Chemotherapy; radio-activity; Nervous system Stimulants; Anticonvulsant Drugs.



RAD 351: Radiology Administration and Management

(1 Unit C: LH 15)

Learning Outcomes

At the end of this course, the students should be able to:

1. explain the operational nature of radiology;
2. describe the processes, roles of radiology, and
3. describe patient booking, /scheduling and quality management approaches.

Course Contents

Application of Managerial functions, Health Management Structure Health Care Policy. Inter-dependence of various departments. Radiology department and organisational structure. Financial resources and management. Vital Personnel Management, Management and communication process. Patient – flow and appointment system. Public Relations. Evaluation of Management principles and performance. Total quality management.

RAD 372: Clinical Posting I

(3 Units C: LH 30; PH 45)

Learning outcome:

At the end of this course, students should be able to:

1. demonstrate procedures involved in x-rays examination of upper extremities and thorax.

Course Contents

Clinical posting at designated hospitals 12 hours per week 2 days' release.

RAD 352: Entrepreneurship/ Education in Radiography

(2 Units C: LH 30)

Learning Outcomes

At the end of this course, the students should be able to:

1. identify opportunities for self-employment in radiography practice;
2. explain personal traits and technical requirements in setting up private radiography facility;
3. apply entrepreneurship and business skills to grow a private radiography facility in a competitive environment;
4. explain ethical issues and regulatory requirements of a private radiography facility;
5. recognise need to help younger colleagues develop their skills in the profession;
6. explain effective educational methods and tools in the health sector; and
7. describe effective public health education strategies in disease screening and control in communities.

Course Contents

Concept of entrepreneurship; Business opportunities in radiography/medical imaging profession. Prerequisites for setting up a radiography/medical imaging facility and site selection. Finding opportunities and sustainable development strategies for the future. Regulatory and safety requirements. Total quality management strategies in a competitive environment. Networking options and tele-radiography in private practice. Ethical issues. Managing growth of a business venture. Education training methods, instructor-led classroom, interactive methods, hands-on training, computer based training, video training and coach/mentoring methods. Emphasis on knowledge, skills and attitudes needed to function in health care environment and interdisciplinary expertise. Community and public health. Theories and models and their application



to real world. Comparative training duration/curricula of radiography in Nigeria, UK, USA and many others.

400 Level

COMED 491: Biostatistics in Health Sciences

(2 Units C: LH 30)

Learning Outcomes

At the end of this course, the students should be able to:

1. describe essential statistics needed in analysing acquired data in health and medical research such as measures of central tendency, dispersion, association; and
2. apply statistical tools for quantitative analysis of research data in health sciences.

Course Contents

Introduction to statistics, definitions and examples of basic statistical terminologies, descriptive statistics and tabular and graphical presentations. Populations samples and the Normal distribution to Demography in medicine, procedures for hypothesis testing. Analysis of variance, correlation and regression, Chi-square, non-parametric techniques, relative risk and measure of strength of association, computers – an overview.

RAD 492: Research Methodology

(2 Units C: LH 30)

Learning Outcomes

At the end of this course, the students should be able to:

1. identify research problem in Radiography;
2. design and execute research project using standard scientific approach;
3. report research conducted following standard protocol; and
4. present research finding orally to a departmental colloquium.

Course Contents

Research process and philosophy behind research, Types of Scientific enquiry. Research designs. Formulation of Hypotheses. Data collection methods. Validity and reliability issues and their importance, sensitivity and specificity issues. Application of bio-statistical tools and methods. Methods of data presentation deductive, inductive and inferences. Ethics of Medical research. Research reporting.

RAD 441: Radiographic Technique III

(2 Units C: LH 15; PH 45)

Learning Outcomes

At the end of this course, the students should be able to:

1. choose contrast media for various contrast investigations;
2. recognise their potential for allergic reactions;
3. acquire skills for patient monitoring; and
4. demonstrate efficiency in other procedures such as paediatric and geriatric radiography.



Course Contents

Other contrast examination, aortography, venography. Ventriculography, Encephalography, Sinography, Fistulography, Ward Radiography. Geriatric, Pediatric Radiography, Principles of Tomography, Macro-radiography, xero- radiography, Digital imaging.

RAD 442: Ultrasound Imaging/Computerised Tomography (2 Units C: LH 15; PH 45)

Learning Outcomes

At the end of this course, the students should be able to:

1. describe cross-sectional anatomy of various parts of the body;
2. state the functions and protocols adopted for sonographic scan of abdo-pelvic region for medical, surgical, gynaecological and obstetric conditions;
3. describe sonography scans of neonatal anomaly and small part organs;
4. explain the basic terminologies associated with CT;
5. describe its instrumentation and the protocols adopted for CT scans of various parts of the body; and
6. apply the safety considerations and associated information technologies.

Course Contents

Common ultrasound terminologies. Normal Pelvic Anatomy: Uterus – anatomy and ultrasound examination. Vagina – sonographic appearance. Ovaries – Anatomy to include shape, size in prepubertal, menstrual and post menstrual stages. Supporting structures – Divisions of the pelvis ie true & false pelvis, location and functions of supporting muscular structures. Sites of fluid accumulation – anterior and posterior cul-de-sac, space of Retzius and fornices. Vasculature – roles of uterine and ovarian arteries. Physiology: Menstrual Cycle – role of the pituitary gland in menstruation should be stated. pregnancy Test – indicators of pregnancy. Fertilisation – formation of embryo. Infertility and Endocrinology. Contraceptives. Sonographic findings with IUCDs. First Trimester: Gestational Sac – embryology of the gestational sac. Sonographic findings of gestational sac development: Yolk Sac, Ovaries (corpus Luteum), Pregnancy failure – Fetal demise, anembryonic pregnancy (blighted ovum), threatened abortion, inevitable, missed, habitual, complete/spontaneous abortion. Ectopic pregnancy. Sonographic examination in the first trimester. Determination of presence or absence of fetal life. Determination of fetal number. Simple description of common artifacts and their origin, Dosimetry, bio effects regulations and standard of practice, quality assurance and equipment specifications. Second and Third Trimester (Normal Anatomy): Basic guidelines for obstetric sonograms. Fetal biometry, Basic survey of fetal anatomy to rule out abnormality. Evaluation of fetal Cranium, Spine, Heart, abdominal organs and limbs Abdominal Sonography: Liver, Structure and Anatomy: Sonographic appearances in normal and disease conditions. **Biliary Tree:** Anatomy of the gall bladder, nature & function of the Bile ducts, Bile and splincter of odds should be stressed. Normal anatomical variants – functional fold, Phrygian cap, Hertmann'spouh, Scanning techniques d. Indications & laboratory values. **Pancreas:** Anatomy – subdivisions, Pancreatic ducts; duct of wirsung, ducts of santorim, blood supply, functions – endocrine & exocrine systems. Scanning techniques & laboratory values. Introduction to Computed Tomography: Basic terminology, Components – imaging, computer and display systems, Digital image processing overview, Image manipulation. Overview of imaging parameters; Protocol selection, Motion reduction. Overview of clinical applications of CT, Information gained, Pathology demonstrated, Basic positioning guidelines. Patient and personal safety: Radiation dose considerations, Table weight limits, Pregnancy, Emergency in the scanning area, Contraindications to patient scanning. Computer Technology: Review of Computers and



their operation, Digital Image Processing; CT Components: Equipment and Software: Data acquisition and Reconstruction: Acquisition methods, Spiral CT, Scanogram, Technical Factors, Image Quality/Manipulation, Radiation Dose, Artifacts, Correcting Suboptimal Images, Display/Recording/Storage and Quality Assurance.

RAD 447: Radio-Nuclide Imaging /Thermography/MRI

(2 Units C: LH 30)

Learning Outcomes

At the end of this course, the students should be able to:

1. determine the type of nuclide, radio pharmaceuticals and quality tests for various radio-nuclide imaging procedures and calculate administered dose;
2. describe the safety precautions, standard procedures and disposal of radioactive wastes are the expected outcome;
3. recognise the need for special consideration in siting the MRI Unit;
4. describe the principles and mechanisms of its operations and be familiar with technologies associated with MRI;
5. describe the protocols that obtain best images for various pathologies and body parts;
6. apply safety precautions involved in MRI procedures; and
7. describe methods of artefact reduction.

Course Contents

Basic principles, Decay schemes of Radionuclide production, cyclotron design and performance, radiopharmaceuticals, impurity levels. Equipment for nuclear medicine generators, procedures, contamination monitoring. Radioisotope image, gamma camera electronics, uniformity correction, dead time performance factors – collimators, shielding requirements, internal dosimetry. Disposal of radioactive waste. Planar imaging, PET, SPECT-PET-CT- principles of operation, procedures, dosimeter and image analysis. Designs of MR scanners: Open, closed systems. Superconductors, Permanent magnets, Resistive magnets. Cooling mechanisms, Nitrogen, Helium and many others. Oxygen levels. Oxygen gauges and meters, Oxygen displacement by helium. Loss of superconductivity. Quench, Shielding systems, The Faraday's cage. Strength of Magnets. Magnet homogeneity. Shimming, Characteristics of the main magnet Strength of the field produced. Tesla (T). Gauss. Magnets in clinical use and in research. Parameters, image quality and trades off: SNR, Slice Thickness FOV, Matrix, NEX, Pixels and voxels. Slice thickness, slice Gap. Noise, Partial volumes. FOV, Matrix, Number of excitations, Acquisition time. TR, TE, Receive bandwidth. Spatial Encoding and Image Formation: The homogenous magnetic field, Behaviour of protons in the magnetic field, Protons and Larmor frequency, Slice direction, Phase direction and Frequency direction, Slice encoding gradient, Slice select gradient, Use of varying bandwidth, Modifying the steepness of the gradient, Gradient fields, Frequency encoding, Phase encoding, K – Space filling, Fourier transformation. Techniques --- Central Nervous System: Coil selection, Immobilisation devices, Ear defenders, Aids for claustrophobic patients—mirror glasses, eye shields, Artefact considerations, Use of saturation bands, Flow compensation, Indications for MRI in the brain and spines, Parameters and, image quality considerations, Patient positioning, Important landmarks and reference points, Protocol selection, Essential and complementary sequences, Image weighting for particular, indications, Thick and thin slices, High resolution slices, Contrast enhancement, Introduction to diffusion weighted imaging.

RAD 421: Radiographic Equipment II

(2 Units C: LH 30)



Learning Outcomes

At the end of this course, the students should be able to:

1. identify specialised x-ray equipment for imaging soft tissue and dynamic studies for gastrointestinal, vascular and gynaecological studies;
2. describe the principles of their operation;
3. explain the safety measures adopted in their use;
4. recognise specialised Radiography dedicated for ease of examination of various parts of the body;
5. describe their construction and operation of these specialised; and
6. explain how they provide better than general purpose units or analogue counterparts.

Course Contents

The X-ray tube, types, construction and operation. high tension cables, tube stands, production, effects and control of scattered radiation. General principles of grids, coordinators and beam centering devices, portable and mobile X-ray equipment. Special Equipment – Tomographic Equipment, Fluoroscopic Equipment, Dental Equipment, Equipment for Neuroradiography, accident and emergency equipment, Image Intensifiers, Rapid series Equipment. Dedicated mammography Equipment.

RAD 431: Radiographic Imaging Process III

(2 Units C: LH 15; PH 45)

Learning Outcomes

At the end of this course, the students should be able to:

1. explain the development that has taken place in image processing from chemical to digital including the Instrumentation;
2. state the differences between analogue and digital processing; and
3. describe the darkroom design that ensures safety of photosensitive materials.

Course Contents

Daylight systems, duplication and subtraction of radiographs, automated film handling systems. Photographic principles and devices. Dark room design. Principles of fibre optics and video transmission. Digital image instrumentation and processing.

RAD 471: Clinical Posting III

(3 Units C: PH 135)

Learning Outcomes

At the end of the clinical posting, students should be able to:

1. define contrast agents used for specialised contrast procedures in radiography;
2. identify various radiological contrast agents, their manufacturers and packaging;
3. prepare patients for such procedures;
4. observe the imaging procedures for various contrast agents;
5. carry out ward and theatre radiography and apply radiation protection and aseptic measures as recommended;
6. identify various sonographic scanning procedures taught in RG 442;
7. participate in MRI procedures and apply safety precautions required in a high intensity magnetic field;
8. learn different protocols for optimising image quality for various pathological and anatomical scenarios; and



9. clinical exposure and hands-on training based on lectures taught in RAD 441 and RAD 442.

RAD 474: Students Industrial Work Experience (SIWES)

(3 Units C: PH 135)

Learning outcome:

At the end of the SIWES, students should be able to;

1. carry out practical demonstrations in a clinical setting.

Course Contents

Extended clinical exposure and hands on training based on lectures taught in RAD 441, RAD 421, RAD 431, RAD 443, RAD 433, RAD 442, RAD 444, RAD 445 and RAD 446.

RAD 482: General/Radiographic Pathology

(2 Units C: LH 30)

Learning Outcomes

At the end of this course, the students should be able to:

1. explain the biochemical, cellular, tissue and organ responses to insults that results to malfunction of the human body;
2. describe At the end of this course the students should be able to the response to injury by various tissues, organs and systems; and
3. identify these morphological changes on images to enable technique modification and quality assesement of images.

Course Contents

Ultrastructure of normal cell, Cell Injury and Death, Degeneration, Necrosis and Intracellular Accumulation, Adaptive Responses: Hypertrophy, Hyperplasia, metaplasia and atrophy, Dysphasia. Disturbances of Fluid Balance. Oedema and Dehydration. Neoplasia: Definition, Classification, Nomenclature, Characteristics, Local and Systemic Effects.

Haemorrhage – Causes, Local Effects, Systemic Effects including shock, Thrombosis, Embolism and Infarction. Inflammation: Acute and Chronic Inflammation, Chemical Mediators of Inflammation, Local and Systemic Effects of Inflammation. Healing and Repairing Regeneration, Primary and Secondary Healing, Factors and delay wound healing, Hypersensitivity reactions. Pathologic Calcification.



500 Level

RAD 531: Radiographic Imaging Process IV (Special Topics) (2 Units C: LH 15; PH 45)

Learning Outcomes

At the end of this course, the students should be able to:

1. identify different types of computed Radiography systems;
2. describe the instrumentation and explain the operation and usage of digital processors to obtain high quality images;
3. describe post processing options available, artefacts and archiving facilities; and
4. provide reasons for environmental pollution from chemical processing of images and suggest conservation methods for amelioration.

Course Contents

Computed radiographic systems; Digital processors (Hardware and software); Archival and retrieval. Quality assurance of image receptors and processors; post acquisition image processing and effects on image quality; chemical image processing and environmental and silver conservation methods

RAD 521: Radiographic Equipment V (Special Topics) (2 Units C: LH 15; PH 45)

Learning Outcomes

At the end of this course, the students should be able to:

1. define the hardware and software requirements of a DSA;
2. describe the principles and operation of a DSA system;
3. identify its peculiarities in application to vascular imaging;
4. demonstrate ability to use DF especially DSA to improve quantitative extraction of information in angiography;
5. identify instruments used for quality assurance tests in radio diagnosis;
6. carry out troubleshooting of equipment malfunction and quality assurance tests using the appropriate quality assurance test devices; and
7. report findings of tests in a standard format.

Course Contents

Digital computed radiography. Basic principles of Equipment for modern imaging modalities, care and maintenance of equipment. Digital fluorography system and components, Dedicated and adapted units and Computer and Digitisation requirements, Digital subtraction angiography(DSA), Road-mapping and quantitative information extraction. Importance of quality assurance in Radiology. Type testing acceptance testing and on-going quality Assurance on the following: Image producers, image processors, image receptors, U/S; image reject analysis. Management/Evaluation of quality Assurance programmes.



**RAD 581: Imaging Critique/Pattern Recognition
45)****(2 Units C: LH 15; PH****Learning Outcomes**

At the end of this course, the students should be able to:

1. recognise normal anatomy in medical images;
2. identify changes in morphology and function for organs and systems due to disease on images; and
3. explain basis to carry out further projections and procedures.

Course Contents

Radiographic film critique and quality control (Film faults); identification of common basic faults and pathologies on radiographs, in order to be able to carry out necessary modifications or additional projections.

RAD 591: Research Seminar**(2 Units C: LH 15; PH 45)****Learning Outcomes**

At the end of this course, the students should be able to:

1. express confidence addressing scientific audience on a well-articulated topic or research report; and
2. use audiovisual aid to present research report or seminar relevant to radiography.

Course contents

Presentation of a paper by each student on an approved topic at a Departmental colloquium.

RAD 592: Project**(4 Units C: LH 30; PH 90)****Learning Outcomes**

At the end of this course, the students should be able to:

1. identify radiographic problem;
2. design a method of solving it employing scientific research process; and
3. report the research project both orally and in bound hard copy the culture of solving problems encountered in research through a scientific approach of good research process.

Course Contents

Each student must produce a bound project report on an approved topic based on any acceptable area of study. It must be a research work carried out by the student under an approved supervisor.

RAD 544: Radiographic Technique V**(2 Units C: LH 15; PH 45)****Learning Outcomes**

At the end of this course the students should be able to:

1. describe applications of radiography in special contrast investigations;
2. explain aseptic conditions involved in these exams;
3. prepare patients for these procedures;
4. explain modifications needed in Ward and theatre radiography;
5. explain the differences between analogue and digital images eg DSA, molecular imaging;



6. describe the applications of digital imaging in angiography and oncology overall knowledge of the students in techniques should be such that the proficiency level guarantees patient safety;
7. identify the need for specialised mammography unit;
8. explain the imaging challenges associated with breast imaging, the social implications of the procedures; and
9. describe the techniques that produce quality images at the least radiation dose to the patient.

Course Contents

Other contrast examinations, venography, Bronchography, ventriculography, Encephalography, Sinography. Principles of Tomography, Macro radiography Xeroradiography. Special topics. Radiographic techniques that describe contemporary procedures in digital, molecular, and oncology imaging. Overview of techniques for all systems. History of Mammography, Albert Salomon (German Surgeon) on 1913, Comparism of surgical tissue and healthy breast. Uses of Mammography Equipment Compression devices, the magnification setup, use of grids and automatic exposure controls, X-ray generators in Mammography. Anatomy of breast, Factors of good quality Mammogram: Radiographer, Patient factor, equipment. Technique factors: Adequate penetration, Contrast and patient dose. Patient preparation, techniques and projections. Male Mammography: breast cancer and gynaecomastia. Indication and techniques for ductography.

RAD 561: Radiotherapy/Oncology I

(2 Units C: LH 15; PH 45)

Learning Outcomes

At the end of this course, the students should be able to:

1. explain the biological basis for radiotherapy;
2. identify relevant staff needed and their respective roles in radiotherapy;
3. explain basis for tumour grading;
4. describe various treatment options for malignant tumours;
5. describe various treatment fields for different types of tumour;
6. explain how organ sparing is achieved during treatment planning; and
7. explain how complications of radiotherapy treatment is managed.

Course Contents

Application of Ionizing Radiation to Tumors and other Diseases. Superficial and Deep Therapy. Heat and Immunotherapy. Nature and Types of Cancer, staying of cancer, causes and Management. Radiotherapy and Chemotherapy Equipment for production of Radiation Therapy Beam. Radiation Beam measurement/Isodose curves. Radiation protection Beam Modifiers/applicators. Simulator and their uses, Manual and automatic Planning. Treatment fields and applications. Radio-therapeutic procedures for selected organs. Mould room and their uses. Management of Patient and Post Treatment Patient Care Drugs.



RAD 551: Rural Radiography

(1 Unit C: LH 15)

Learning Outcomes

At the end of the course, students should be able to:

1. recognise the role of radiographers at primary healthcare level level, particularly the use of x-rays and ultrasound to provide diagnostic information in pediatric emergencies, perinatal and other medical/surgical emergencies;
2. explain the principles and methods of public health education and administration and the social responsibilities of healthcare personnel in communicable and non-communicable diseases environment;
3. integrate principles of preventive medicine in diagnostic medical imaging; and
4. describe the role of a radiographer as an effective team member in delivery of health service in the rural area.

Course Contents

Epidemiology – Definition, Principles and methods, Health Education, Environmental health, Occupational health, Public Health administration/Health Care. Epidemiology of Communicable and non-communicable diseases. Social medicine, National and International Regulations relating to health. Radiography and sonography in pediatric, maternal care and emergencies.

RAD 572: Clinical Posting 1V

(4 Units C: PH 180)

Learning Outcomes

At the end of the clinical posting, students should be able to:

1. practically differentiate the features of a mammography unit from a general purpose unit;
2. explain the requirements of soft tissue imaging;
3. note reasons for various referrals for mammography;
4. relate the anatomy to real life presentations at the imaging room;
5. carry out imaging procedures with good quality outcome while observing all the ethics associated with breast imaging for both gender;
6. identify common cases that present at primary health care centres requiring diagnostic imaging;
7. carry out both radiographic and sonographic procedures as required in the log book; and
8. carry out digital imaging procedures and produce high quality images.

Course Contents

Clinical exposure and hands on training for 15 hours a week based on based on lectures taught in RAD 544, RAD 581 and RAD 551.

Minimum Academic Standards

Resource Requirements for Teaching and Learning

The Universities shall ensure the provision of adequate human, physical, equipment and library facilities in all the learning areas with strong Information and Communication Technology infrastructure for the implementation of these minimum standards.



Equipment

Four laboratories/studios are needed, viz:

1. conventional x-ray demonstration laboratory equipped with a functional x-ray unit complete with a virtual radiography laboratory;
2. an ultrasound laboratory with appropriate probes-sector/linear transvaginal probes of varying frequencies;
3. physics/equipment laboratory; and
4. film viewing/library laboratory for image quality research/critique.

Departmental X-ray demonstration laboratory should have:

1. a functional X-ray unit and accessories;
2. a well-equipped dark room large enough to accommodate at least 10 students at a time. An auto-processor and a digital processing unit;
3. audiovisual aids/viewing boxes;
4. phantoms/models;
5. radiology quality assurance kit, Quality assurance kit for ultrasound(AIUM); and
6. trolleys.

Radiation protection materials such as Lead rubber shields, lead gloves, gonadal shields, lead aprons, step wedged lead shields, dosimetry equipment and personnel monitoring devices such as GM counters, TLD chips, film badges, pocket ionization chamber.

Equipment for care of patients

Pillows, foam pads, sand bags, patient harnessing devices.

Ultrasound laboratory

Ultrasound units with linear/sector transducers, transrectal / other probes

Physics laboratory

There should also be a Physics Equipment Laboratory: This should have image intensifiers, X-ray tubes, cathode ray tubes, moving coil meters, avometers, viewing boxes, Circuit boards, Rheostats, a/c transformers Geiger-Muller Counters, ionisation chamber complete with densitometers. Laboratory should be available in the parent department offering the course in Physics.

Virtual Radiography laboratory

Virtual radiography simulation software/ laboratory with sufficient workstations for clinical simulation, demonstration and practice.-x-ray room and CT suite softwares.

Not more than two students per work station is allowed.

The hospital Radiology departments where students are posted for radiographic practice should be those approved by the relevant regulatory authority. These should be equipped with General purpose X-ray, Fluoroscopy Unit, CT, MRI, Mammography Unit

Staffing

The academic staff-student ratio should not exceed 1:15 in the program. There should also be a minimum of 2 lecturers in each of the sub-specialties namely; conventional radiography and pattern recognition, ultrasonography, computerised tomography and MRI, Radiotherapy and



Nuclear Medicine, physics/ radiation protection and radiology administration. Professionally qualified radiographers with higher degrees in radiography and/or related disciplines as well as holders of higher degrees in related sciences are eligible to be considered as academic staff. The required staff mix in qualification and rank approved by NUC shall be applicable while maintaining the 1:15 staff student ratio

Library

There shall be a library, which should house enough electronic and physical learning resources and materials, in addition to current text books, journals, publications, there should be advanced information technology equipment and resource materials available. This should meet the requirements of number, diversity, relevance, currency and many others.

Classroom, Laboratories and Office Spaces

The program should have a clinical base where students are posted for practical and skill acquisition. Such hospital/health facility should be equipped with diagnostic medical imaging equipment in all modalities for a comprehensive exposure. viz; general purpose and A/E Xray units, Fluoroscopy Units, CT, MRI Ultrasound units Mammography, Dental and many others.

Classroom should be adequate for the number of students and equipped with ICT.

Adequate number of offices should be provided for staff. Only staff below Senior Lecturer can share offices but all should be of adequate space and fully equipped with furniture, air conditioner, filing cabinets for safety of exam materials and many others. All these should meet minimum NUC requirements in terms of space per student.

Classroom

The standard requirement of 0.65m² per full-time student should be maintained. Thus the minimum total space requirement for a faculty or department shall be the product of its total full time equivalent student enrolment (FTE) and the minimum space requirement per full-time equivalent i.e. (FTE) 0.65m².

Office

In this respect, each academic staff should have an office space of at least 25 square metres taking into cognisance the status/cadre of the staff

In addition, there should be for the Faculty, a Dean's office and for each Department a Head of Department's office with attached offices for their supporting staff as specified below in m²:

| | | |
|----------------------------------|---|-------|
| Professor's office | - | 18.50 |
| Head of Department's office | - | 18.50 |
| Tutorial teaching staff's office | - | 13.50 |
| Other teaching staff space | - | 7.00 |
| Technical staff space | - | 7.00 |
| Secretarial space | - | 7.00 |
| Staff research laboratory | - | 16.50 |
| Seminar Space/per student | - | 1.85 |
| Laboratory space (per student) | - | 7.50 |



B.SLT. Speech-Language Therapy

Overview

The revised curriculum for Speech-Language Therapy proposed a shift from 4-year programme to 5-year programme as a result of expanded courses occasioned by the inclusion of more health science courses to justify the health science profession status of the programme; its placement in the Allied Health Sciences Faculty instead of Faculty of Education and to be in tandem with the international Speech-Language Therapy education structures. The curriculum also stated that the inclusion of **language** in the title of the program is to reflect the language components in the operations of the profession. It further discussed the philosophy, aims and objectives of the programme, presented the admission and examination guidelines, course outlines, course descriptions and course distributions by semesters and academic years, list of books, journals and recommended materials/equipment as well as stating the minimum requirements of staff and infrastructures for running the programme.

Philosophy

The philosophy of Bachelor of Speech-Language Therapy (B.SLT.) programme focuses on advancing the scientific understanding of human communication process and its disorders in view to improve the lives of people with communication disorders across the lifespan. The programme therefore is designed to equip students with quality knowledge and skills required for proper identification, assessment and treatment of speech-language related disorders. It presents high-quality learning that is student-centered delivered in stimulating environment. It integrates teaching, clinical practice and research geared towards enabling students to develop technical competence, gain professional insights and acquire service-oriented attitude expected of 21st Century Speech-Language Therapy professionals.

Objectives

The objectives of the Bachelor of Speech-Language Therapy programme are therefore as follows:

1. provide students with a broad and balanced foundation knowledge and practical skills in Speech-Language Therapy needed for enabling them to perform effectively in academics, clinical diagnostic, preventive and rehabilitative services, therapeutic, public health, and quality assurance; as well as to function independently or in collaboration with other members of the service team in the care of individuals and groups at all levels of health care;
2. involve students of Speech-Language Therapy in an intellectually stimulating and satisfying experience of learning, studying, research and innovation;
3. inculcate in students a sense of enthusiasm for Speech-Language Therapy profession, an appreciation of its application in different contexts (such as healthcare, advocacy, collaboration, community services and many others);
4. develop in students, the ability to apply knowledge and skills acquired from their training for providing solutions to theoretical and practical problems in the local and global healthcare systems;
5. provide students with a knowledge and skills base from which they can proceed to further studies in Speech-Language Therapy;
6. empower graduates of Speech-Language Therapy with skills that will enable them engage in entrepreneurship and income yielding ventures;



Unique Features of the Programme

1. The programme name changed from Speech-Therapy to **Speech-Language Therapy** to reflect the language components of the profession and to comply with the international best practice.
2. The new programme changed the training duration from 4 years to 5 years with enlarged course content first to accommodate the newly introduced health science courses and to be in accordance with the international best practices in Bachelor of Speech-Language Therapy education.
3. Inclusion of the **Sustainable Development course** in the general studies courses is to raise students' interest in sustainable development studies.
4. Introduction of the Total Communication (Sign Language) is to enable Speech-Language Therapists communicate and work very efficiently with patients who have hearing impairment or verbal language difficulty.

Employability Skills

The programme promotes the following employability skills:

1. identification of appropriate therapeutic options for result-oriented patient management;
2. engaging sound clinical reasoning and decision-making process suitable for specific patients' needs;
3. effective communication skills in management and patient related matters;
4. proper documentations;
5. professionalism matters such as of exhibiting enthusiasm about one's profession and demonstrating commitment to professional obligations; and
6. effective leadership and administration of Speech-Language Therapy clinics, units and many others.

21st Century Skills

1. Collaboration and team work
2. Creativity and imagination
3. Critical thinking
4. Problem solving
5. Flexibility and adaptability
6. Information Literacy
7. Leadership
8. Civic literacy and citizenship
9. Social responsibility
10. Technology literacy
11. Initiative

Justification for changing the programme from four to five years

The programme was formerly domiciled in the Faculty of Education where it ran for four years with limited courses in medical sciences. The Medical Rehabilitation Therapists Board, which regulates Speech-Language Therapy in the country has recommended that the programme be moved to Faculty of Medical Rehabilitation as showcased by the University of Medical Sciences, Ondo, Ondo State. This is also in line with the Speech-Language Therapy education duration in the international community.

Admission and Graduation Requirements



Admission to 100 Level

Candidates who seek admission to undertake Bachelor of Speech-Language Therapy (B.SLT) programme must satisfy the minimum requirements of university of choice. The requirements include credits passes in Chemistry, Physics, Biology, English Language and Mathematics in Senior Secondary Certificate (SSC) or its equivalent are accepted provided that the listed subjects are passed at two sitting.

In addition, candidates shall pass with appropriate scores in Chemistry, Physics, Biology and English Language in the Unified Tertiary Matriculation Examination (UTME) and obtain the required aggregate score in post UTME as may be approved by the University Senate.

Candidates admitted into 100 level (pre-professional year) shall only proceed to 200 level when 100 level courses have been passed fully.

Direct Entry

In addition to having passed SSCE or its equivalent with a minimum of 5 credit passes including English Language, Mathematics, Physics, Biology and Chemistry at two sitting, prospective candidates must have acquired any of the following:

1. minimum of grade C pass at Higher School Certificate advanced level or its equivalents in Biology, Chemistry and Physics are accepted in not more than one sitting;
2. minimum of Second Class degree in any of the basic medical sciences from approved universities;
3. must be a holder of a diploma (upper credit) by the institution's accredited professional bodies.

Graduation Requirements

To graduate, a student should have undergone four years (eight consecutive semesters) or five years (10 consecutive semesters) of study depending on his/her entry point. Course workload must meet the graduation requirements of the University.

To be eligible for graduation, students must fulfil all undergraduate and institutional requirements.



Global Course Structure

The course sequence shall be arranged in stages as follows:

The Pre-Professional Stage (Stage Pre I: 100 Level): at this stage, student activities are guided by the regulations of Faculty of Science and the University.

Stage I or Professional Stage I (200 Level and First Semester of 300 Level): students take lecture together with Medical and Dental students in Anatomy, Physiology, Biochemistry, Pharmacology, Biostatistics, Computer literacy, Introduction to Community Health and Behavioural Sciences. In addition however, B.SLT students will be required to take Introduction to Medical Rehabilitation and Rehabilitative Physics.

The duration of this stage is as determined by the Faculty of Basic Medical Sciences and the relevant Departments but will usually last for 18 months.

Pre-stage II (Stage Pre II, Second Semester of 300 level): this is a preparative stage for clinical training of the B.SLT degree programme. This will normally last for 3 months and it is a compulsory stage that students are expected to perform satisfactorily before progressing to stage II.

Stage II (400 Level, Clinical Year I): students shall be introduced to the fundamentals of speech therapy clinical practice and knowledge needed to educate and rehabilitate patients with Speech-Language Pathology (SLP). Also, the basic procedures of clerking, patient or client problem identification and measurements required for evidence based practice will be introduced under supervision. This will last for 9 months.

Stage III (500 Level, Clinical Year II): this stage shall last for 10 months and students are to have concentrated hands - on learning experience, examine, reach a diagnosis, plan and treat patients/clients under the supervision and guidance of a licensed Speech-Language Therapist. Students are assigned supervisors who will guide their research in a specialty of their choice culminating in a dissertation to be examined during the final examination.

100 Level

| Course code | Course Title | Unit(s) | Status | LH | PH |
|-------------|-----------------------------------|-----------|--------|----|----|
| GST111 | Communication in English | 2 | C | 15 | 45 |
| GST 112 | Nigerian people and their culture | 2 | C | 30 | - |
| BIO 101 | General Principles of Biology | 2 | C | 30 | - |
| CHM 101 | General Chemistry1 | 2 | C | 30 | - |
| CHM 102 | General Chemistry II | 2 | C | 30 | - |
| CHM 107 | Practical Chemistry I | 1 | C | - | 45 |
| CHM 107 | Practical Chemistry II | 1 | C | - | 45 |
| MTH 101 | Elementary Mathematics 1 | 2 | C | 30 | - |
| PHY 101 | General physics 1 (Mechanics) | 2 | C | 30 | - |
| PHY 107 | General Experimental Physics I | 1 | C | - | 45 |
| | Total | 17 | | | |



200 Level

| Course code | Course Title | Unit(s) | Status | LH | PH |
|--------------------|---|----------------|---------------|-----------|-----------|
| GST212 | Philosophy, Logic and Human Existence | 2 | C | 30 | - |
| ENT211 | Entrepreneurship and Innovation | 2 | C | 30 | - |
| PST 201 | Rehabilitative Physics | 2 | C | 30 | - |
| BCH 201 | Biochemistry | 2 | C | 30 | - |
| PSY 202 | Introductory Psychology | 2 | C | 30 | - |
| PST 202 | Introduction to Medical Rehabilitation | 2 | C | 30 | - |
| ANA 204 | Anatomy of Thorax, Abdomen, Pelvis and Perineum | 2 | C | 15 | 45 |
| ANA201 | Anatomy of Upper and Lower Limb | 2 | C | 15 | 45 |
| PIO 203 | Physiology of Excitable Tissues | 2 | C | 30 | - |
| PIO201 | Introductory Physiology and Blood | 2 | C | 30 | - |
| ANA 301 | Anatomy of Head and Neck | 2 | C | 15 | 45 |
| PIO 305 | Neurophysiology I | 2 | C | 30 | - |
| PIO 214 | Introduction to Cardiovascular and Respiratory Physiology | 2 | C | 30 | - |
| | Total | 28 | | | |

300 Level

| Course code | Course Title | Unit(s) | Status | LH | PH |
|--------------------|--|----------------|---------------|-----------|-----------|
| GST 312 | Peace and Conflict Resolution | 2 | C | 30 | - |
| ENT 312 | Venture Creation | 2 | C | 15 | 45 |
| PST 311 | Programming for Rehabilitation professionals | 2 | C | 30 | - |
| BCH304 | Biochemistry111 for Medical Students. | 2 | C | 30 | - |
| PHA 312 | Pharmacology for Medical Rehabilitation Professional | 2 | C | 30 | - |
| AUD 312 | Basic Procedures in Audiology | 2 | C | 30 | - |
| PST 313 | Pathology Rehabilitation Professionals | 2 | C | 30 | - |
| COM 315 | Biostatistics | 2 | C | 30 | - |
| PHA 301 | General Principles of Pharmacology | 2 | C | 30 | - |
| SLT 311 | Introduction to Speech-Language Therapy | 1 | C | 15 | - |
| SLT 312 | Speech-language Development Across the Span | 2 | C | 30 | - |
| SLT 313 | Clinical Methods in Speech-language Therapy | 1 | C | - | 45 |
| SLT 314 | Total Communication (Sign Language I&II) | 2 | C | - | 90 |
| | Total | 24 | | | - |



400 Level

| Course code | Course title | Unit(s) | Status | LH | PH |
|--------------------|---|----------------|---------------|-----------|-----------|
| AUD 409 | Aural Rehabilitation | 2 | C | 30 | - |
| PST 411 | Research Method in Medical Professionals. | 2 | C | 30 | - |
| SLT 411 | Speech and Language Disorders Across the Span. | 2 | C | 30 | - |
| SLT 412 | Theories, Principles and Practice in Speech-Language Therapy. | 2 | C | 30 | - |
| SLT 413 | Medical Speech-Language Pathology | 2 | C | 30 | - |
| SLT 414 | Phonetics and Linguistics in Speech-Language Therapy | 2 | C | 30 | - |
| SLT 415 | Medical Conditions Amenable to Speech-Language Therapy | 1 | C | 15 | - |
| SLT 416 | Student Teaching Clinical Internship | 2 | C | - | 90 |
| SLT 417 | Entrepreneurship in speech-Language Therapy | 2 | C | 30 | - |
| SLT 418 | Augmentative and Alternative Communication Systems | 1 | C | 15 | - |
| SLT 419 | Cleft Palate/ lips and Cerebral Palsy | 2 | C | 30 | - |
| SLT 410 | Clinical Work in Speech-Language Therapy. | 1 | C | - | 45 |
| | Total | 20 | | | |

500 Level

| Course code | Course Title | Unit(s) | Status | LH | PH |
|--------------------|---|----------------|---------------|-----------|-----------|
| PST 503 | Rehabilitation and Functional Training | 2 | C | 30 | - |
| SLT 511 | Special Topics Seminar in Speech-Language Therapy | 2 | C | 30 | - |
| SLT 500 | Project | 3 | C | - | 135 |
| SLT 512 | Articulation Disorders and Multilingualism. | 2 | C | 30 | - |
| PST 513 | Communication skills and Ethics | 2 | C | 30 | - |
| SLT 513 | Autism Spectrum Disorders (ASD). | 1 | C | 15 | - |
| SLT 514 | Dysphagia and Aphasia | 2 | C | 30 | - |
| SLT 515 | Voicing and Fluency Disorders | 1 | C | 15 | - |
| SLT 516 | Professionalism and Speech-Language Therapy | 1 | C | 15 | - |
| | Total | 16 | | | |



Course Contents and Learning Outcomes

100 Level

GST 111: Communication in English

(2 Units C: LH 15; PH 45)

Learning Outcomes

At the end of this course, students should be able to:

1. identify possible sound patterns in English Language;
2. list notable Language skills;
3. classify word formation processes;
4. construct simple and fairly complex sentences in English;
5. apply logical and critical reasoning skills for meaningful presentations;
6. demonstrate an appreciable level of the art of public speaking and listening; and
7. write simple and technical reports.

Course Contents

Sound patterns in English Language (vowels and consonants, phonetics and phonology). English word classes (lexical and grammatical words, definitions, forms, functions, usages, collocations). Sentence in English (types: structural and functional, simple and complex). Grammar and Usage (tense, mood, modality and concord, aspects of language use in everyday life). Logical and Critical Thinking and Reasoning Methods (Logic and Syllogism, Inductive and Deductive Argument and Reasoning Methods, Analogy, Generalisation and Explanations). Ethical considerations, Copyright Rules and Infringements. Writing Activities: (Pre-writing , Writing, Post writing, Editing and Proofreading; Brainstorming, outlining, Paragraphing, Types of writing, Summary, Essays, Letter, Curriculum Vitae, Report writing, Note making and many others. Mechanics of writing). Comprehension Strategies: (Reading and types of Reading, Comprehension Skills, 3RsQ). Information and Communication Technology in modern Language Learning. Language skills for effective communication. Major word formation processes. Writing and reading comprehension strategies. Logical and critical reasoning for meaningful presentations. Art of public speaking and listening.

GST 112: Nigerian Peoples and Culture

(2 Units C: LH 30)

Learning Outcomes

At the end of the course, students should be able to:

1. analyse the historical foundation of the Nigerian culture and arts in pre-colonial times;
2. list and identify the major linguistic groups in Nigeria;
3. explain the gradual evolution of Nigeria as a political unit;
4. analyse the concepts of Trade, Economic and Self-reliance status of the Nigerian peoples towards national development;
5. enumerate the challenges of the Nigerian State towards Nation building;
6. analyse the role of the Judiciary in upholding people's fundamental rights;
7. identify acceptable norms and values of the major ethnic groups in Nigeria; and
8. list and suggest possible solutions to identifiable Nigerian environmental, moral and value problems.



Course Contents

Nigerian history, culture and art up to 1800 (Yoruba, Hausa and Igbo peoples and culture; peoples and culture of the ethnic minority groups). Nigeria under colonial rule (advent of colonial rule in Nigeria; Colonial administration of Nigeria). Evolution of Nigeria as a political unit (amalgamation of Nigeria in 1914; formation of political parties in Nigeria; Nationalist movement and struggle for independence). Nigeria and challenges of nation building (military intervention in Nigerian politics; Nigerian Civil War). Concept of trade and economics of self-reliance (indigenous trade and market system; indigenous apprenticeship system among Nigeria people; trade, skill acquisition and self-reliance). Social justices and national development (law definition and classification. Judiciary and fundamental rights. Individual, norms and values (basic Nigeria norms and values, patterns of citizenship acquisition; citizenship and civic responsibilities; indigenous languages, usage and development; negative attitudes and conducts. Cultism, kidnapping and other related social vices). Re-orientation, moral and national values (The 3R's – Reconstruction, Rehabilitation and Re-orientation; Re-orientation Strategies: Operation Feed the Nation (OFN), Green Revolution, Austerity Measures, War Against Indiscipline (WAI), War Against Indiscipline and Corruption(WAIC), Mass Mobilization for Self-Reliance, Social Justice and Economic Recovery (MAMSER), National Orientation Agency (NOA). Current socio-political and cultural developments in Nigeria.

BIO 101: General Principles of Biology

(2 Units C: LH 30)

Learning Outcomes

At the end of lectures in Plant Biology, students should be able to:

1. explain cells structure and organisations;
2. summarise functions of cellular organelles;
3. characterise living organisms and state their general reproduction;
4. describe the interrelationship that exists between organisms;
5. discuss the concept of heredity and evolution; and
6. enumerate habitat types and their characteristics.

Course Contents

Cell structure and organisation. functions of cellular organelles. characteristics and classification of living things. chromosomes, genes their relationships and importance. General reproduction. Interrelationships of organisms (competitions, parasitism, predation, symbiosis, commensalisms, mutualism, saprophytism). Heredity and evolution (introduction to Darwinism and Lamarckism, Mendelian laws, explanation of key genetic terms). Elements of ecology and types of habitat.

CHM 101: General Chemistry I

(2 Units C: LH 30)

Learning Outcomes

At the end of this course, students should be able to:

1. define atom, molecules and chemical reactions;
2. discuss the Modern electronic theory of atoms;
3. write electronic configurations of elements on the periodic table;
4. justify the trends of atomic radii, ionization energies, electronegativity of the elements based on their position in the periodic table;
5. identify and balance oxidation – reduction equation and solve redox titration problems;
6. illustrate shapes of simple molecules and hybridised orbitals;



7. identify the characteristics of acids, bases and salts, and solve problems based on their quantitative relationship;
8. apply the principles of equilibrium to aqueous systems using LeChatelier's principle to predict the effect of concentration, pressure and temperature changes on equilibrium mixtures;
9. analyse and perform calculations with the thermodynamic functions, enthalpy, entropy and free energy; and
10. determine rates of reactions and its dependence on concentration, time and temperature.

Course Contents

Atoms, molecules and chemical reaction. Chemical equation and stoichiometry. Atomic structure and periodicity. Modern electronic theory of atoms. Radioactivity. Chemical bonding. Properties of gases. Equilibria and Thermodynamics. Chemical Kinetic. Electrochemistry.

CHM 102: General Chemistry II

(2 Units C: LH 30)

Learning Outcomes

At the end of this course, students should be able to:

1. state the importance and development of organic chemistry;
2. define fullerenes and its applications;
3. discuss electronic theory;
4. determine the qualitative and quantitative of structures in organic chemistry;
5. describe rules guiding nomenclature and functional group classes of organic chemistry;
6. determine rate of reaction to predict mechanisms of reaction;
7. identify classes of organic functional group with brief description of their chemistry;
8. discuss comparative chemistry of group 1A, IIA and IVA elements; and
9. describe basic properties of Transition metals.

Course Contents

Historical survey of the development and importance of Organic Chemistry. Fullerenes as fourth allotrope of carbon, uses as nanotubes, nanostructures, nanochemistry. Electronic theory in organic chemistry. Isolation and purification of organic compounds. Determination of structures of organic compounds including qualitative and quantitative analysis in organic chemistry. Nomenclature and functional group classes of organic compounds. Introductory reaction mechanism and kinetics. Stereochemistry. The chemistry of alkanes, alkenes, alkynes, alcohols, ethers, amines, alkyl halides, nitriles, aldehydes, ketones, carboxylic acids and derivatives. The Chemistry of selected metals and non-metals. Comparative chemistry of group IA, IIA and IVA elements. Introduction to transition metal chemistry.

CHM107: Practical Chemistry I

(1 Unit C: PH 45)

Learning Outcomes

At the end of the course, students should be able to:

1. describe the general laboratory rules and safety procedures;
2. collect scientific data and correctly carrying out chemical experiments;
3. identify the basic glassware and equipment in the laboratory;
4. identify the differences between primary and secondary standards;
5. perform redox titration;
6. recording observations and measurements in the laboratory notebooks; and



7. analyse the data to arrive at scientific conclusions.

Course Contents

Laboratory experiments designed to reflect topics presented in courses CHM 101 and CHM 102. These include acid-base titrations, qualitative analysis, redox reactions, gravimetric analysis, data analysis and presentation.

CHM 108: General Chemistry Practical II

(1 Unit C: PH 45)

Learning Outcomes

At the end of this course, the students should be able to:

1. identify the general laboratory rules and safety procedures;
2. collect scientific data and correctly carrying out Chemical experiments;
3. identify the basic glassware and equipment in the laboratory;
4. identify and carry out preliminary tests which includes ignition, boiling point, melting point, test on known and unknown organic compounds;
5. perform solubility tests on known and unknown organic compounds;
6. conduct elemental tests on known and unknown compounds; and
7. conduct functional group/confirmatory test on known and unknown compounds which could be acidic / basic / neutral organic compounds.

Course Contents

Continuation of CHM 107. Additional laboratory experiments to include functional group analysis, quantitative analysis using volumetric methods.

MTH 101: Elementary Mathematics (Algebra and Trigonometry) (2 Units C: LH 30)

Learning Outcomes

At the end of the course students should be able to:

1. explain basic definition of Set, Subset, Union, Intersection, Complements and use of Venn diagrams;
2. solve quadratic equations;
3. solve trigonometric functions;
4. identify various types of numbers; and
5. solve some problems using Binomial theorem.

Course contents

Elementary set theory; subset, union, intersection, complements, venn diagrams. Real numbers; Integers, Rational and Irrational numbers, mathematical, induction, Sequences and Series, Theory of Quadratic equations, Binomial theorem. Complex numbers; Algebra of complex numbers; the Argand Diagram. De-Moivre's theorem, nth roots of unity, Circular measure, Trigonometric functions of angles of any magnitude, addition and factor formulae.



PHY 101: General Physics I (Mechanics)

(2 Units C: LH 30)

Learning Outcomes

At the end of the course, the student should be able to;

1. identify and deduce the physical quantities and their units;
2. differentiate between vectors and scalars;
3. describe and evaluate motion of systems on the basis of the fundamental laws of mechanics;
4. apply Newton's laws to describe and solve simple problems of motion;
5. evaluate work, energy, velocity, momentum, acceleration, and torque of moving or rotating objects;
6. explain and apply the principles of conservation of energy, linear and angular momentum;
7. describe the laws governing motion under gravity; and
8. explain motion under gravity and quantitatively determine behaviour of objects moving under gravity.

Course Contents

Space and time. Units and dimension, Vectors and Scalars. Differentiation of vectors: displacement, velocity and acceleration. Kinematics. Newton laws of motion (Inertial frames, Impulse, force and action at a distance, momentum conservation). Relative motion. Application of Newtonian mechanics. Equations of motion. Conservation principles in physics. Conservative forces. Conservation of linear momentum. Kinetic energy and work. Potential energy. System of particles. Centre of mass. Rotational motion: Torque, vector product, moment, rotation of coordinate axes and angular momentum. Polar coordinates. Conservation of angular momentum. Circular motion. Moments of inertia. gyroscopes and precession. Gravitation: Newton's Law of Gravitation. Kepler's Laws of Planetary Motion. Gravitational Potential Energy. Escape velocity. Satellites motion and orbits.

PHY 107: General Experimental Physics I

(1 Unit C: PH 45)

Learning Outcomes

At the end of this course, the student should be able to;

1. conduct measurements of some physical quantities;
2. make observations of events, collect and tabulate data;
3. identify and evaluate some common experimental errors;
4. plot and analyse graphs; and
5. draw conclusions from numerical and graphical analysis of data.

Course Contents

This introductory course emphasises quantitative measurements, the treatment of measurement errors and graphical analysis. A variety of experimental techniques should be employed. The experiments include studies of meters, the oscilloscope, mechanical systems, electrical and mechanical resonant systems, light, heat, viscosity etc., covered in PHY 101 and PHY 102. However, emphasis should be placed on the basic physical techniques for observation, measurements, data collection, analysis and deduction.

Stage I B.SLT (Professional Stage I)



200 Level

GST 212: Philosophy, Logic and Human Existence

(2 Units C: LH 30)

Learning Outcomes

A student who has successfully gone through this course should be able to:

1. enumerate the basic features of philosophy as an academic discipline;
2. identify the main branches of philosophy & the centrality of logic in philosophical discourse;
3. describe the elementary rules of reasoning;
4. distinguish between valid and invalid arguments;
5. think critically and assess arguments in texts, conversations and day-to-day discussions;
6. critically assess the rationality or otherwise of human conduct under different existential conditions;
7. develop the capacity to extrapolate and deploy expertise in logic to other areas of knowledge; and
8. guide his or her actions, using the knowledge and expertise acquired in philosophy and logic.

Course Contents

Scope of philosophy; notions, meanings, branches and problems of philosophy. Logic as an indispensable tool of philosophy. Elements of syllogism, symbolic logic— the first nine rules of inference. Informal fallacies, laws of thought, nature of arguments. Valid and invalid arguments, logic of form and logic of content — deduction, induction and inferences. Creative and critical thinking. Impact of philosophy on human existence. Philosophy and politics, philosophy and human conduct, philosophy and religion, philosophy and human values, philosophy and character molding and many others.

ENT 211: Entrepreneurship and Innovation

(2 Units C: LH 30)

Learning Outcomes

At the end of this course, students should be able to:

1. explain the concepts and theories of entrepreneurship, intrapreneurship, opportunity seeking, new value creation, and risk taking;
2. state the characteristics of an entrepreneur;
3. analyse the importance of micro and small businesses in wealth creation, employment, and financial independence;
4. engage in entrepreneurial thinking;
5. identify key elements in innovation;
6. describe stages in enterprise formation, partnership and networking including business planning;
7. describe contemporary entrepreneurial issues in Nigeria, Africa and the rest of the world; and
8. state the basic principles of e-commerce.



Course Contents

Concept of Entrepreneurship (Entrepreneurship, Intrapreneurship/Corporate Entrepreneurship,). Theories, Rationale and relevance of Entrepreneurship (Schumpeterian and other perspectives, Risk-Taking, Necessity and opportunity-based entrepreneurship and Creative destruction). Characteristics of Entrepreneurs (Opportunity seeker, Risk taker, Natural and Nurtured, Problem solver and change agent, Innovator and creative thinker). Entrepreneurial thinking (Critical thinking, Reflective thinking, and Creative thinking). Innovation (Concept of innovation, Dimensions of innovation, Change and innovation, Knowledge and innovation). Enterprise formation, partnership and networking (Basics of Business Plan, Forms of business ownership, Business registration and Forming alliances and joint ventures). Contemporary Entrepreneurship Issues (Knowledge, Skills and Technology, Intellectual property, Virtual office, Networking). Entrepreneurship in Nigeria (Biography of inspirational Entrepreneurs, Youth and women entrepreneurship, Entrepreneurship support institutions, Youth enterprise networks and Environmental and cultural barriers to entrepreneurship). Basic principles of e-commerce.

PST 201: Rehabilitative Physics

(2 Units C: LH 30)

Learning outcome

At the end of this course, students should be able to:

1. describe basic principles of physics used in electromedical equipment in all rehabilitation specialties;
2. define laws of physics various aspect of physical phenomena and their interaction with human body as applied to all rehabilitation specialties;
3. describe basic concepts of electricity, its laws, magnetism, electro mechanics and related theories in all rehabilitation specialties;
4. explain fundamentals of low, medium and high frequency currents, heat, electromagnetic radiations and sound waves as applied to all rehabilitation specialties; and
5. demonstrate safety skills in biomedical instruments and radiation protection.

Course Contents

Structure of matter, property of matter, energy and its transformation. Energy and its definitions, mechanical energy, conductor-insulator. Static electricity, condensers, current electricity, conduction of electricity through electrolytes. Conduction in semi-conductors. Magnetic energy. Production of electricity. Principles and application of E.M.F. to Choke coil, transformer Regulation of induced currents. Physics of sound, perceptual and productive processes of speech, basic instrumentation, and the interrelationships of these areas to communication. Fundamentals, concepts and theories of acoustics, speech signal and perception. Rectification of A/C; Thermal energy; Transmission of heat; Conduction, Convection and Radiation Electromagnetic waves, Radiant energy; Grothus law; Cosine law; Inverse square law; Sonic energy; nature and properties of sound wave. Nature, effects and principles of production of direct current, muscle stimulating currents; modification of currents; Reverse, interrupt, surge mechanical, manual electronic multi vibration circuit. High frequency current basic circuit. The physics of quantum medicine.



BCH 201: Biochemistry

(2 Units C: LH 30)

Learning Outcomes

At the end of the course, students should be able to:

1. explain the structure of different macromolecules in biological system;
2. identify types of chemical reactions involving these macromolecules;
3. explain the various methods of isolation of these macromolecules;
4. estimate the effects of acids and alkalis on the macromolecules;
5. explain how to purify the macromolecules; and
6. discuss quantification of various macromolecules.

Course Contents

Introductory chemistry of amino acids; their properties, reactions and biological functions. Classification of amino acids: neutral, basic and acidic; polar and non-polar; essential and non-essential amino acids. Peptides. Introductory chemistry and classification of proteins. Biological functions of proteins. Methods of their isolation, purification and identification. Primary, secondary, tertiary and quaternary structures of proteins. Basic principles of tests for proteins and amino acids. Introductory chemistry of carbohydrates, lipids and nucleic acids. Nomenclature of nucleosides, and nucleotides; effects of acid and alkali on hydrolysis of nucleic acids.

PSY 202: Introductory Psychology

(2 Units C: LH 30)

Learning Outcomes

At the end of this course, students should be able to:

1. explain what psychology is;
2. discuss major concepts in psychology;
3. express the influence of heredity and influence on human development;
4. discuss processes and stages of human development;
5. identify developmental disorders in childhood and adulthood; and
6. explain psychopathology and psychotherapy.

Course Contents

Introduction to Psychology. Fields of application of Psychology. The influence of heredity and environment on the individual. Learning – theories and principles of learning. Learning disabilities. Memory – types, theories of memory and forgetting. Methods to improve memory. Thinking – the process of thinking, problem-solving, decision making and creative thinking. Motivation - theories and types of motivation. Emotions - theories of emotions and stress, Emotional and behavioural disorders of childhood and adolescence, Disorders of under and over controlled behaviour, Eating disorders. Attitudes – theories, attitudes and behaviour. Factors in attitude change. Intelligence - theories of intelligence, I.Q., general intelligence and special intelligence. Intelligence tests, and their uses. Personality. Theories of personality. Factors influencing personality. Personality disorders. Conflict and frustration - Common defensive mechanism. Identification, regression, repression, projection, sublimation and rationalization. Attention and Perception: Nature of attention, factors determining attention, nature of perception, principle of perceptual grouping; illusions and Hallucination. Counselling - Aims and principles. Development and growth of behaviour in infancy and childhood, adolescence, adulthood and old age. Normal and abnormal. Psychotherapy – introduction to paradigms in



psychopathology and therapy. Mental deficiency –a)Mental retardation, b) Autistic behaviour c) Learning disabilities.

PST 202: Introduction to Medical Rehabilitation

(2 Units C: LH 30)

Learning Outcomes

At the end of the course, students should be able to:

1. explain the scope of his/her discipline and ethical responsibility attached to the discipline as well as history of the practice of medical rehabilitation locally and globally;
2. describe the importance and role of family input in the process of rehabilitation or healing of the patient;
3. list out the laws and regulations surrounding medical rehabilitation practice; and
4. apply the technique of using all other existing modalities for communication with the patient.

Course Contents

History. Ethical orientation and scope of practice of medical rehabilitation professions. Roles of medical rehabilitation in preventive, promotive, curative and rehabilitative care. Importance of patients in health care, and patient's family in treatment. Responsibilities of the clinician and the patient. Student/patient relationship. Respect and confidentiality. Patient care communication – Professional conduct and ethical practice. Teamwork. Listening and interviewing skills. Use and interpretation of verbal and nonverbal communication. Emotional responses to, and strategies for managing patient's behavior and patient's safety. Medical laws and regulation.

ANA 204: Gross Anatomy of Thorax, Abdomen, Pelvis & Perineum (2 Units C: LH 30)

Learning Outcomes

At the end of the course, students should be able to:

1. identify the bones and bony markings of the thorax, abdomen, pelvis and perineum;
2. list the nine regions and four quadrants and the principal organs and structures that lie deep to them and which can be palpated in those regions;
3. describe the muscular components of the anterior abdominal wall, blood supply and innervation of the anterior abdominal wall;
4. identify the arteries, veins and lymphatics of the thorax, abdomen, pelvis and perineum; be able to list the main branches of the aorta and their territories; and describe the disposition of the main veins in the abdomen;
5. describe the parts, position, vertebral levels and surface markings of the stomach and duodenum as well as the position, vertebral levels and surface markings of the pancreas, spleen, liver and gall bladder;
6. describe the greater and lesser omenta and the lesser sac;
7. describe the disposition of the jejunum and ileum; describe the surface anatomy of the caecum, ascending colon, transverse colon, descending colon and sigmoid colon;
8. describe the anatomy of the pelvic diaphragm, its midline raphe, perineal body, attachment points and the structures passing through it in males and females;
9. describe the anatomy of the ischio-anal fossa;
10. describe the anatomy and relations of the ovary, uterine tubes, uterus, cervix and vagina, including their peritoneal coverings;
11. describe the anatomy and neurovascular supply of the clitoris, vulva and vagina; the anatomy of the urogenital diaphragm and perineal 'pouches';



12. describe the origin, course and distribution of the pudendal nerves and the sites of pudendal nerve block;
13. describe the lymphatic drainage of the foregut, pelvic and perineal organs;

Course Contents

Introduction to the trunk; thoracic cage; intercostal space; thoracic cavity; pleural cavities; lungs; mediastinum general; anterior & superior mediastinum; middle; mediastinum – heart and pericardium; heart – applied anatomy; posterior mediastinum. General anatomy of abdomen and abdominal regions; anterior abdominal wall muscles; inguinal canal – inguinal and femoral hernias; peritoneal cavity and spaces; abdominal oesophagus, stomach, duodenum, spleen, small intestine, large intestine, appendix; portal venous system; portocaval anastomoses; liver and gallbladder. Pancreas and biliary apparatus; kidneys, suprarenal glands, and ureters; diaphragm; posterior abdominal wall; aorta and inferior vena cava; posterior abdominal wall muscles; lumbosacral plexus; bony and ligamentous pelvis; pelvic diaphragm (floor); male reproductive organs; female reproductive organs; male and female external genitalia; perineum; rectum and anal canal; pelvic blood vessels; abdomino-pelvic nervous system.

ANA 201: Anatomy of Upper & Lower Limbs

(2 Units C: LH 15; PH 45)

Learning Outcomes

At the end of the course, students should be able to:

1. define fundamental anatomical terminology and discuss the anatomical position;
2. describe the anatomy of the musculoskeletal system, including the axial skeleton; appendicular skeleton, appendicular and axial muscles, and arthrology;
3. describe the general features of the bones of the upper and lower limbs;
4. identify the major muscles of the upper and lower limbs;
5. explain the types and structure of the joints of the upper and lower limbs;
6. correlate between the attachment of the muscles and their functions on the different joints;
7. identify the major nerves of the upper and lower limbs;
8. describe the functional components of each of the major nerves and its distribution;
9. identify and describe the course of the major superficial veins of the upper and lower limbs; and
10. name the major arteries of the upper and lower limbs.

Course Contents

Descriptive terms, plans and terms of relationship of the human body, terms of comparison, attachment of muscles, types of muscles, movements of joints. Osteology, principles of kinesiology, general organisation of body system. Cutaneous innervation of the upper limb; pectoral region; breast; axilla; shoulder region; arm and cubital fossa; flexor compartment of forearm; extensor compartment of forearm; hand; venous and lymphatic drainage of the upper limb. Applied anatomy of nerves; blood supply of the upper limb. Cutaneous innervation of the lower limb; femoral triangle; adductor canal and medial side of the thigh; gluteal region; back of the thigh, popliteal fossa; extensor compartment of the leg and dorsum of the foot; peroneal and flexor compartment of the leg; sole of the foot, arches of the foot; mechanism of walking; venous and lymphatic drainage of the lower limb; applied anatomy of the nerves and blood supply to the lower limb.

PIO 203 Physiology of Excitable Tissues

(2 Units C: LH 30)



Learning outcomes

At the end of this course, students should be able to:

1. list the steps in excitation-contraction coupling in skeletal muscle;
2. describe the structure of the neuromuscular junction;
3. list some intracellular factors that can cause muscle fatigue;
4. describe the distinguishing characteristics of multi-unit and unitary smooth muscles;
5. explain the steps in the excitation-contraction coupling mechanism in cardiac muscle and compare with skeletal muscle including different mechanisms for sarcoplasmic reticulum calcium release;
6. explain how the resting membrane potential is generated
7. state the Nernst equation, and indicate how this equation accounts for both the chemical and electrical driving forces that act on an ion;
8. discuss the mechanisms by which an action potential is propagated along both nonmyelinated and myelinated axons;
9. describe the principle of the voltage clamp and how it is used to identify the ionic selectivity of channels; and
10. discuss the disorders that can occur at the neuromuscular junction.

Course Contents

Structure and functions of nerves, cardiac muscle, smooth muscle and skeletal muscle, Muscles: structure, excitation, theories of excitation-contraction. Membrane potentials. Nerve generation and conduction of impulse and its physiological properties. Synapses and synaptic transmission

PIO 201: Introductory Physiology and Blood

(2 Units C: LH 15)

Learning Outcomes

At the end of the course, students should be able to:

1. describe the composition of a cell membrane;
2. explain how a potential difference across a membrane will influence the distribution of a cation and an anion;
3. describe how transport rates of certain molecules and ions are accelerated by specific membrane transport proteins;
4. distinguish between active (primary and secondary) transport, facilitated diffusion, and passive diffusion based on energy source and carrier protein involvement;
5. identify the mechanisms and role of selective transporters for amino acids, neurotransmitters, nutrients, etc;
6. explain the general concepts of homeostasis and the principles of positive and negative feedback in physiological systems;
7. identify the site of erythropoietin production, the stimulus for its release, and the target tissue for erythropoietin action;
8. discuss the normal balance of red blood cell synthesis and destruction, including how imbalances in each lead to anemia or polycythemia;
9. list and differentiate the various types of leukocytes;
10. describe the role of thrombocytes in haemostasis; and
11. list clotting factors and the discuss the mechanism of anti-coagulants.

Course Contents



Introduction and history of physiology. Structure and functions of cell membranes. Transport process, special transport mechanism in amphibian bladder, kidney, gall bladder, intestine, astrocytes and exocrine glands. Biophysical principles. Homeostasis and control systems including temperature regulation, biological rhythms, composition and functions of blood haemopoiesis. WBC and differential count, plasma proteins, coagulation fibrinolysis and platelet functions. Blood groups –ABO system – Rh system – blood transfusion – indication for collection and storage of blood, hazards of blood transfusions. Reticulo-endothelial system, immunity and immunodeficiency disease and HIV.

ANA 301 Gross Anatomy of Head & Neck

(2 Units C: LH 30)

Learning Outcomes

At the end of the course, students should be able to:

1. recognise anatomical structures correctly and comprehend the topographic anatomy of the head and neck region;
2. identify major musculoskeletal elements of the skull, face, ear, nasal cavity, pharynx, larynx, oral cavity, and cervical and thoracic regions;
3. identify the major blood vessels which supply the features of the head and neck;
4. describe the structure and function of the brain, spinal cord, neural pathways and cranial nerves; and
5. describe in particular the course and distribution of the facial and trigeminal cranial nerves.

Course Contents

Cervical vertebrae, bones of the skull; interior of the cranium mandible; scalp temple and face I; scalp temple and face II; side of the neck-posterior triangle; anterior triangle of neck; cranial cavity, meninges, venous sinuses, hypophysis cerebri, cranial nerves; deep dissection of neck including thyroid and parathyroid glands; deep dissection of blood vessels & nerves of neck paravertebral region. Orbit and lachrymal apparatus; side of neck/posterior triangle; anterior triangle of the neck; parotid, temporal & infratemporal regions; submandibular region; mouth, pharynx and soft palate; nasal cavity/paranasal sinuses; larynx/tongue/eyeball; external, middle and internal ear.

PIO 305: Neurophysiology I

(2 Units C: LH 30)

Learning Outcomes

At the end of the course, students should be able to:

1. explain how inhibitory and excitatory post-synaptic potentials can alter synaptic transmission;
2. list the major receptor classifications and representative receptor agonists;
3. describe the cutaneous and proprioceptive mechanoreceptors and their function;
4. describe formation and reabsorption of cerebral spinal fluid (CSF), including the anatomy and function of the choroid plexus;
5. compare and Contrast the barrier mechanisms between the blood brain barrier and the blood CSF barrier and the consequences of barrier break down;
6. describe the major areas of the cerebral cortex and their roles in perception and motor coordination. Identify the Brodmann areas for visual, auditory, somatosensory, motor, and speech areas;



7. discuss the pathways for Pain/Temperature/Coarse Touch System and its connections to the cerebral cortex;
8. list the neural components of the Dorsal Column-Medial Lemniscus system and its Trigeminal analogues;
9. describe the functions of the medial and lateral motor pathways. Trace their origins and terminations within the spinal cord;
10. describe the physiologic-anatomy of the major ascending tracts (anterolateral and dorsal column-medial lemniscus systems) and descending spinal cord tract (cortico-spinal tract, CST), including crossing of midline;
11. list the functions of the following brainstem reflexes: cardiovascular baroreceptor, respiratory stretch receptor, cough reflex, pupillary light reflex, gag reflex, and blink reflex;
12. explain the role of the brain stem reticular formation in pain perception and modulation, level of consciousness, integration of brainstem reflexes, and the location of noradrenergic, serotonergic, and dopaminergic nuclei;
13. list the physiological functions of the Hypothalamus;
14. list the three functional divisions of the cerebellum, detailing the input and output connections of each, describe how these areas are integrated with the lateral and medial motor pathways;
15. discuss the overall functions of the basal ganglia in the initiation and control of movement;
16. describe how the amygdala interacts with the cerebral cortex to produce cognitive emotional behaviours;
17. describe the three states of human brain activity based on EEG, EOG and EMG recordings; and
18. distinguish the major characteristics of the major seizure disorders: Grand mal, Absence seizure (Petite mal), simple partial and complex partial seizures, and status epilepticus.

Course Contents

Organisation of the CNS and CNS control systems. Nerve generation and conduction of impulses. Synapses and synaptic transmission. Peripheral nervous system -the reflex arc and general properties of reflexes. Receptors. Spinal reflexes. Excitation and Inhibition. Localization of functions in the cortex. Motor system. Pyramidal and extrapyramidal sensory systems. Reticular formation. Cerebellum: Control of posture. Neurobiology rhythms. Sleep and unconscious states. Memory, learning. Physiology of Special Senses: Eye: retina, sight, accommodation. Photochemical mechanism. Receptor potential. Light reflexes and adaptation. Ear: sound waves, hearing. Taste. Smell.



PIO 214: Introduction to Cardiovascular and Respiratory Physiology (2 Units C: LH 30)

Learning Outcomes

At the end of this course, students should be able to:

1. state Starling's law of the heart and describe the application of the law in keeping the output of the left and right ventricles equal;
2. describe how ionic currents contribute to the four phases of the cardiac action potential;
3. explain the ionic mechanism of pacemaker automaticity and rhythmicity, and identify cardiac cells that have pacemaker potential and their spontaneous rate;
4. identify neural and humoral factors that influence their rate;
5. describe the various phases of ventricular systole and ventricular diastole;
6. describe the timing and causes of the four heart sounds;
7. explain why the ECG tracing looks different in each of the 12 leads;
8. explain the principles underlying cardiac output measurements using the Fick principle, dye dilution, and thermodilution methods;
9. list the factors that shift laminar flow to turbulent flow;
10. describe the relationship between velocity, viscosity, and audible events, such as murmurs and bruits;
11. describe how arterial systolic, diastolic, mean, and pulse pressure are affected by changes in a) stroke volume, b) heart rate, c) arterial compliance, and d) total peripheral resistance;
12. define the Starling equation and discuss how each component influences fluid movement across the capillary wall;
13. list the anatomical components of the baroreceptor reflex;
14. explain three positive feedback mechanisms activated during severe hemorrhage that may lead to circulatory collapse and death;
15. define compliance and identify two common clinical conditions in which lung compliance is higher or lower than normal;
16. list the factors that determine total lung capacity, functional residual capacity, and residual volume;
17. define surface tension and describe how it applies to lung mechanics, including the effects of alveolar size and the role of surfactants;
18. explain how the shape of the oxyhemoglobin dissociation curve influences the uptake and delivery of oxygen;
19. list the forms in which carbon dioxide is carried in the blood; and
20. identify the regions in the central nervous system that play important roles in the generation and control of normal respiration.



Course Contents

The heart; events of the cardiac cycle. Control of cardiac contractility. Cardiac electrophysiology. Properties of cardiac muscles. Cardiac output - measurement and control. Haemodynamics of circulation. Arterial blood pressure and its regulation. Cardiovascular reflexes. Peripheral resistance and local control of the circulation. Regional blood flow. Cardiovascular changes in exercise, haemorrhage and shock. Respiratory physiology – functions of upper respiratory tract. Mechanics of respiration including compliance. Surfactant. Lung volume and capacities. Pulmonary gas exchange. Blood gas transport. Pulmonary function tests. Nervous and chemical control of respiration. Response to hypoxia, high altitude, exercise and artificial respiration.

300 Level

GST 312: Peace and Conflict Resolution

(2 Units C: LH 30)

Learning Outcomes

At the end of the course, students should be able to:

1. analyse the concepts of peace, conflict and security;
2. list major forms, types and root causes of conflict and violence;
3. differentiate between conflict and terrorism;
4. enumerate security and peace building strategies; and
5. describe roles of international organisations, media and traditional institutions in peace building.

Course Contents

Concepts of Peace. Conflict and Security in a multi-ethnic nation. Types and Theories of Conflicts: Ethnic, Religious, Economic, Geo-political Conflicts; Structural Conflict Theory, Realist Theory of Conflict, Frustration-Aggression Conflict Theory. Root causes of Conflict and Violence in Africa: Indigene and settlers Phenomenon; Boundaries/boarder disputes; Political disputes; Ethnic disputes and rivalries; Economic Inequalities; Social disputes; Nationalist Movements and Agitations; Selected Conflict Case Studies – Tiv-Junkun; Zango Kartaf, Chieftaincy and Land disputes and many others. Peace Building, Management of Conflicts and Security: Peace & Human Development. Approaches to Peace & Conflict Management --- (Religious, Government, Community Leaders and many others.). Elements of Peace Studies and Conflict Resolution: Conflict dynamics assessment Scales: Constructive & Destructive. Justice and Legal framework: Concepts of Social Justice; The Nigeria Legal System. Insurgency and Terrorism. Peace Mediation and Peace Keeping. Peace & Security Council (International, National and Local levels) Agents of Conflict resolution – Conventions, Treaties Community Policing: Evolution and Imperatives. Alternative Dispute Resolution, ADR. Dialogue b). Arbitration, c). Negotiation d). Collaboration and many others. Roles of International Organisations in Conflict Resolution. (a). The United Nations, UN and its Conflict Resolution Organs. (b). The African Union & Peace Security Council (c). ECOWAS in Peace Keeping. Media and Traditional Institutions in Peace Building. Managing Post-Conflict Situations/Crisis: Refugees. Internally Displaced Persons, IDPs. The role of NGOs in Post-Conflict Situations/Crisis.



ENT 312: Venture Creation

(2 Units C: LH 15; PH 45)

Learning Outcomes

At the end of this course, students, through case study and practical approaches, should be able to:

1. describe the key steps in venture creation;
2. spot opportunities in problems and in high potential sectors regardless of geographical location;
3. state how original products, ideas, and concepts are developed;
4. develop business concept for further incubation or pitching for funding;
5. identify key sources of entrepreneurial finance;
6. implement the requirements for establishing and managing micro and small enterprises;
7. conduct entrepreneurial marketing and e-commerce;
8. apply a wide variety of emerging technological solutions to entrepreneurship; and
9. appreciate why ventures fail due to lack of planning and poor implementation.

Course Contents

Opportunity Identification (Sources of business opportunities in Nigeria. Environmental scanning, Demand and supply gap/unmet needs/market gaps/Market Research. Unutilised resources, Social and climate conditions and Technology adoption gap). New business development (business planning, market research). Entrepreneurial Finance (Venture capital, Equity finance, Micro finance, Personal savings, Small business investment organisations and Business plan competition). Entrepreneurial marketing and e-commerce (Principles of marketing, Customer Acquisition & Retention, B2B, C2C and B2C models of e-commerce, First Mover Advantage. E-commerce business models and Successful E-Commerce Companies,). Small Business Management/Family Business: Leadership & Management, Basic book keeping, Nature of family business and Family Business Growth Model. Negotiation and Business communication (Strategy and tactics of negotiation/bargaining, Traditional and modern business communication methods). Opportunity Discovery Demonstrations (Business idea generation presentations. Business idea Contest, Brainstorming sessions, Idea pitching). Technological Solutions (The Concept of Market/Customer Solution, Customer Solution and Emerging Technologies. Business Applications of New Technologies - *Artificial Intelligence (AI)*, Virtual/Mixed Reality (VR). Internet of Things (IoTs), Blockchain, Cloud Computing, Renewable Energy and many others. Digital Business and E-Commerce Strategies).

PST 311: Programming for Rehabilitation Professionals

(2 Units C: LH 30)

Learning Outcomes

At the end of the course, students should be able to:

1. explain basics of computer programming;
2. define programming;
3. explain the history behind computer programming;
4. explain the use and importance of computer programming as applied to rehabilitation; and
5. list steps of 2D and 3D computer aided designing method.



Course Contents

Basics of CAD. Introduction. Definition. History. Current status. Product Cycle. Automation. Designing. Application and Benefits. Computer Graphics. Introduction of software. Function of graphic package, Application Software. AutoCad 2010 and updated version. Introduction. Foundation of AutoCad Commands. Execution of Simple 2D Drawings. Understanding 3D commands. Executing 3D Commands, Creating 3D objects. Rendering and Image attach to an object Starting New Projects. Creating. Editing. Saving Drawing, Annotation. Dimension. Plotting, Customisation, Auto Lisp. Introduction to CNC, History of CNC, Advantages and disadvantages of N/C, CNC, DNC, Major part of CNC. Basics of CAM. Introduction of CNC machine, basics of Computer Aided Designing and Manufacturing (CAD/CAM) and its use in P&O. Other kinds of Computer use in Prosthetics and Orthotics. CAD/CAM Technology in socket making and also making of different kinds of orthosis and prosthesis. CAD/CAM in Prosthetics & Orthotics: types of digitizers used, concept of different types of modifying software. CNC carver and its specification, step wise fabrication procedure of sockets, shells and spinal orthoses, its advantages and disadvantages.

BCH 304: Biochemistry III for Medical Students

(2 Units C: LH 30)

Learning outcome

At the end of the course, students should be able to:

1. describe amino acids;
2. explain protein metabolism;
3. identify relationships between urea cycle and other pathways;
4. explain antibody and antigens;
5. discuss neurochemistry; and
6. explain heme biosynthesis and degradation.

Course Contents

Biochemistry of hormones. Peptide, amino acid derived and steroid hormones. Structure/function relationship. Mode of action. Primary and secondary messengers and steroid hormones. cAMP and G-protein. Hormonal control of glycogen metabolism and adipose tissue metabolism. The role of hormone in digestion. Abnormalities associated with derangement of hormonal control mechanism such as diabetes. Metabolism and metabolic effects of the thyroid, parathyroid, pancreas, adrenals, oral contraceptives. **Chemistry of the Immune System;** Antibody and antigens. Classes of immunoglobulins. The immune system of the body. The role of leucocytes in immune responses – Humoral, cellular. Complement proteins. Immunological tolerance and autoimmune diseases. Immunosuppressive drugs. Monoclonal antibodies. **Neurochemistry;** Morphology of neurons. Nervous tissue, lipids and proteins. Biochemistry of nerve transmission and action potential. Functions and biosynthesis of neurotransmitters. A brief outline of the mechanism of action of some neurotoxic compounds. Schizophrenia, and Parkinson's disease. Multiple sclerosis. **Heme Biosynthesis and Degradation;** Porphyrins. Bile pigments, liver conjugation. Hemolytic, neonatal, and obstructive jaundice. Hepatitis. Blood chemistry. Erythrocyte metabolism. **Biochemistry of Muscles;** Excitable membranes. Morphology of skeletal, cardiac and smooth muscle. Muscle and mechanism of muscle contraction. The role of sarcoplasmic reticulum and calcium in muscle contraction. Metabolic fuels of muscle. Biochemistry of muscular dystrophy and myopathies. Special aspects of cardiac muscle. **Biochemistry of environmental hazards;** Biochemistry of transformation of foreign substances. Absorption,



transportation, and excretion] and factors affecting metabolic transformation. Cancer and bacterial Biochemistry. Forensic Biochemistry; Southern Blot technique, Western Blot technique.

PHA 301: General Principles of Pharmacology

(2 Units C: LH 30)

Learning Outcomes

At the end of the course, students should be able to:

1. discuss sources of drugs;
2. describe the various routes of drug administration and how they influence onset of drug action;
3. state the factors that affect drug absorption, distribution, metabolism and excretion;
4. explain the role of receptors as targets for drug action;
5. discuss the fundamental differences between agonists and antagonists; and
6. define the common system parameters in pharmacokinetics and their measurements.

Course Contents

Introduction: History of Pharmacology and relationship of Pharmacology to other Pharmaceutical and clinical subjects. Definition and sources of drugs. Routes of drug administration. Drug absorption, distribution, elimination and factors affecting them. Enzyme induction and enzyme inhibition. Mechanisms of drug action – receptor and non-receptor theory. Drug dosage and dose response curves. Measurement of some pharmacokinetic parameters.

PHA 312: Pharmacology for Medical Rehabilitation Professionals (2 Units C: LH 30)

Learning Outcomes

At the end of this course, students should be able to:

1. describe general principles of pharmacology; and
2. discuss prescription and/or over-the-counter medications used in the management of a variety of patient conditions encountered during rehabilitation.

Course Contents

General Principle of Pharmacology. Pharmacology for Central Nervous System disorders, skeletal muscles and cerebrovascular pharmacology and many others. Determination of dosage, application, essential chemical contents, their pharmacologic actions, route and depth of penetration of topical drugs and required instrumentations shall be taught.

AUD 312: Basic Procedures in Audiology

(2 Units C: LH 30)

Learning Outcomes

At the end of the course, students should be able to:

1. state how to clerk a patient (case history taking) and perform the task;
2. describe some basic measurements like vital signs;
3. perform basic otoscopic examinations;
4. perform audiological examinations-both screening and diagnostic;
5. demonstrate procedure of patient clerking to reach a diagnosis and should be able to apply some advanced auditory tests for patients;
6. list out battery of tests based on case history of patients and clinical observation;



7. explain different classifications, types, configurations and site of lesions of the hearing disorder based on test findings;
8. apply the knowledge of masking technique in pure tone audiometry;
9. explain what an audiogram is and their clinical interpretations; and
10. explain what a tympanogram is and their clinical interpretations.

Course Contents

Audiological tests such as pure tone audiometry (air/bone conduction), masking technique in pure tone audiometry (PTA). Tympanometry and acoustic reflex tests, otoscopic examination, tuning fork tests, auditory brain-stem response test, oto-acoustic emission test, speech audiometry, vestibular investigations (calorics, VENG) and many others. Behavioural audiometric test-distraction test, cooperative test, performance test, speech discrimination test, visual reinforcement audiometry, weight and vital signs measurement. The general principles underlying treatment in audiologic condition, neurologic, hearing condition and rehabilitation in general.

PST 313: Pathology for Rehabilitation Professionals

(2 Units C: LH 30)

Learning Outcome

At the end of the course, students should be able to:

1. discuss concepts of general pathology;
2. discuss recognise signs and symptoms that are considered red flag for serious disease;
3. discuss and disseminate pertinent information and findings, and ascertain the appropriate steps to follow during rehabilitation;
4. describe consequences of pathologic processes on the structure and function of the human body;
5. discuss selected disorders/diseases common to acute care in the physical therapy; and
6. explain normal structure and function, in relation to disease processes in the physical therapy.

Course Contents

Definition of pathology. Diseases and relevant terms used in pathology. The causes and classification of diseases Cell damage and its sequel inflammation, its function and type. Inflammation – Acute inflammation: features, causes, vascular and cellular events. Chronic inflammation: Causes, Types, Classification, Repair, Wound healing by primary and secondary union, factors promoting and delaying the process. Infection and bodies' defence against it Cross infections and its control. Some important bacterial fungal and viral infections including Tuberculosis Hypertrophy, dysplasia and dystrophy Tumours, their etiology, types classifications and characteristics. Cysts, their formation and classification. Developmental anomalies or disturbances. Effects of ionising radiation on human tissues, Trauma wounds, fractures, dislocations and bleeding. Systems pathology disorders of blood- RBCs WECs and thrombocytes Disorders of circulations, the heart, and respiratory system, diseases of the Gastro-intestinal tract disorders of bones and joints. Disorders of blood: Constituents of blood and bone marrow, Regulation of hematopoiesis. Anemia: Classification, clinical features & lab diagnosis, Hemodynamic disorders, thrombo embolic disease & shock. i. Ischemic, necrosis, thrombosis, embolism, Infarction, shock. ii. Gangrene. iii. Thromboangitis obliterans. Neoplasia – Definition, classification, Biological behaviour : Benign and Malignant, Carcinoma and Sarcoma, principles of their spread. Hypersensitivity diseases and immunity – Brief overview of hypersensitivity reaction allergies & auto immune diseases. Genetic disorders – Brief over view of genetic disease.



Nerurovascular diseases : Outline of Cerebro-vascular disorders ii. Trauma to brain and spinal cord. iii. Demyelinating diseases like multiple sclerosis. iv. Degenerative diseases like parkinsons disease. v. Peripheral vascular disease vi. Poliomyelitis. Metabolic disorders – Diabetic mellitus-Types, Pathogenesis, Pathology, Laboratory diagnosis.

COM 315: Biostatistics

(2 Units C: LH 30)

Learning Outcomes

At the end of the course, students should be able to:

1. design a research proposal;
2. review and critique research papers in journals;
3. develop a research question, and identify appropriate designs to address research aims and objectives;
4. apply the knowledge of data collection and analysis;
5. draw up questionnaires and scientifically apply such questionnaires;
6. explain different statistical methods and their applicability to different research proposals;
7. list ethical rules that governs conduct of research; and
8. explain the process of conducting and publishing a research paper in a peer-review, high impact factor journal.

Course Contents

Research topic. Sampling techniques. Design of questionnaires Data gathering. Hypothesis formulation. Probability distribution. Normal Poisson and Binomial distribution Mean. Standard error. Standard deviation. Curve fitting. Chi-square test. Student T test. F-distribution. Regression. Correlation. Quantitative and Qualitative research models. Advanced statistical analysis.

SLT 311: Introduction to Speech-Language Therapy

(1 Unit C: LH 15)

Learning Outcomes

At the end of this course, students should be able to:

1. recall the concept of Speech-Language Therapy;
2. express the relevance of Speech-Language Therapy Profession;
3. describe the development of Speech-Language Therapy practice;
4. list some qualities expected of Speech-Language Therapists; and
5. discuss some ethical issues in Speech-Language Therapy practice.

Course Contents

Definitions, concepts and terminologies of Speech-Language Therapy. History of Speech-Language Therapy. Development of Speech-Language Therapy in different parts of the world. Importance of Speech-Language Therapy. Development and disorders of speech. Development and disorders of language. Place of Speech-Language Therapy in Medical Rehabilitation or allied health professions. Foundations of Speech-Language Therapy in Education, Arts, Psychology and Medicine, Contemporary Speech-Language education. Attributes of Speech-Language professionals. Challenges and prospects of Speech-Language practice. Professional ethics of Speech-Language Therapy practice.

SLT 312: Speech-Language Development Across the Span

(2 Units C: LH 30)



Learning Outcomes

At the end of this course, students should be able to:

1. recall specific milestones in speech-language development;
2. state specific speech behaviour of children at specific months of growth;
3. identify signs of normal and abnormal speech development as children grow;
4. assess normal and abnormal speech growth in children;
5. assess normal and abnormal language development in toddlers; and
6. review corresponding speech-language behaviours and cognitive, neurological and social development of growing children, youth and adults.

Course Contents

Speech development in new born babies. Observable signs of normal speech development in young children. Observable signs of abnormal speech development in children. Impacts of early life infections, malnutrition and birth defects on childhood speech development. Transition from speech age to language age. Signs of normal language development in growing children, youth and young adult. Assessment of normal and abnormal language development in youth and adults.

SLT 313: Clinical Methods in Speech-Language Therapy

(1 Unit C: PH 15)

Learning Outcomes

At the end of this course, students should be able to:

1. describe intuition, critical thinking, divergent thinking, creative thinking, and many others;
2. illustrate specific processes involved in making clinical decisions;
3. evaluate some evidence-based clinical issues; and
4. demonstrate how patients' actions are useful for clinical reasoning and decision making.

Course Contents

Essential clinical procedures in Speech-Language Therapy. Knowledge and skills involved in clinical assessment, treatment and preventive interventions. Importance of acquisition of clinical reasoning, decision-making skills, treatment and preventive interventions. Processes of acquiring clinical reasoning, decision-making, treatment and preventive interventions. Factors determining the processes and use of reasoning and decisions made in practical or clinical settings. Development and use of evidence-based principles in clinical Speech-Language practice.



Stage II (400 Level: Professional Year II)

SLT 411: Speech-Language Disorders Across the Span

(2 Units: C: LH 30)

Learning Outcomes

At the end of this course, students should be able to:

1. describe specific speech-language disorders common with children and adults;
2. explain nature or characteristics of specific speech-language disorders across the span;
3. list causes of speech-language disorders across the span;
4. review the trends of speech-language disorders across the span;
5. explain assessment procedures for speech-language disorders across the span; and
6. express appropriate therapies for specific speech-language disorders across the span.

Course Contents

Definitions of specific speech-language disorders. Characteristics of speech-language disorders across the span. Causes of speech-language disorders. Assessment of specific speech-language disorders across the span. Prevalence of specific speech-language disorders. Therapies for specific speech-language disorders.

PST 411: Research Methods in Medical Rehabilitation

(2 Units: C: LH 30)

Learning Outcomes

At the end of the course, students should be able to:

1. demonstrate understanding of research methodology;
2. explain the meaning of research, objectives of research, types of research & research approaches;
3. formulate research problem: Statement of research problem Statement of purpose and objectives of research problem;
4. define research problem;
5. formulate research design;
6. demonstrate meaning of research design;
7. explain the need for research design;
8. carry out sampling design, criteria for selecting sampling procedure;
9. conduct measurement & scaling techniques;
10. demonstrate measurement in research- measures of scales, sources of error in measurement;
11. demonstrate ability of carrying out methods of data collection, collection of primary data, sampling fundamentals, need for sampling; and
12. demonstrate ability of conducting analysis of data: Types of analysis, testing of hypothesis, and basic concept of research.



Course Contents

Introduction to Biostatistics. Definition – Statistics and Biostatistics. Applications of Biostatistics. Data collection from experiments & surveys. Variable – Qualitative & Quantitative, Discrete and Continuous. Presentation of Data: - a). Tabular Presentation of Data – Statistical Table, Format of a Table. b) Frequency Distribution – construction of Frequency Distribution, cumulative and relative frequency distribution, Exclusive and inclusive method of classification of data. c) Diagrammatic Presentation of Data: - Bar diagrams, Pie Diagram, Line Diagram, Pictogram, Cartogram or Statistical map.d) Graphical representation of a Frequency distribution – Histogram, Frequency. Polygon. Frequency curve, ogives or cumulative frequency curves. Research methodology: Introduction to Research methodology: Meaning of research, objectives of research, types of research & research approaches. Research problem: Statement of research problem Statement of purpose and objectives of research problem, Necessity of defining the problem 3. Research design: Meaning of research design, Need for research design. Sampling Design: Criteria for selecting sampling procedure. Measurement & scaling techniques: Measurement in research- Measurement scales, sources of error in measurement. Methods of data collection: collection of primary data. Sampling fundamentals, need for sampling 8. Analysis of data: Types of analysis. Testing of hypothesis, basic concept.

SLT 412: Theories, Principles and Practice of Speech-Language Therapy (2 Units C: LH 30)

Learning Outcomes

At the end of this course, students should be able to:

1. list some principles of intervention in Speech-Language Therapy practice;
2. explain some unique features of Speech-Language Therapy practice;
3. describe a Speech-Language Therapists initiates therapeutic intervention; and
4. discuss some key procedures in Speech-Language intervention.

Course Contents

Introducing students to basic principles that must be followed in Speech-Language therapy practice. Dynamics, statistic and therapeutic interventions for patients with speech-language (communication). Individualising patients' therapies in line with their peculiar needs. Application of interventions in setting and manner that promote patients' knowledge of step by step progression. Highlighting the basic procedures that must be followed in therapeutic sessions. Emphasising the importance of intervention documentation and strategies used in intervention.

SLT 413: Medical Speech-Language Pathology

(2 Units C: LH 30)

Learning Outcomes

At the end of this course, students are expected to:

1. describe the structure of hearing and speech organs;
2. explain the neurological mechanism of hearing speech organs;
3. list common diseases of speech and hearing organs in children and adults; and
4. illustrate the diagnosis of auditory, speech and neurological mechanism.



Course Contents

Comprehensive study of the structures and functions of the auditory, speech, and neurological mechanisms. Examining the relationships among the structures and functions of auditory, speech and neurological mechanisms. Basic understanding of medical speech-language pathology for both pediatrics and adults including medical terminology, medical setting procedures and competencies. Knowledge of common and more complex medical diagnosis as well as unfamiliar/less common diagnoses, tracheostomies, ventilators and speaking valves, Introduction to the medical team, and medical ethics.

SLT 414: Phonetics and Linguistics in Speech-Language Therapy (2 Units C: LH 30)

Learning Outcomes

At the end of this course, students should be able to:

1. list some principles of intervention in Speech-Language Therapy practice;
2. explain some unique features of Speech-Language Therapy practice;
3. describe a Speech-Language Therapists initiates therapeutic intervention; and
4. discuss some key procedures in Speech-Language intervention.

Course Contents

Introduction to Phonetics and Linguistics. Phonetics as the physics of sound. The study of the theoretical principles of phonetics and their application in the assessment and treatment of communication disorders. Fundamental concepts of linguistics. Theories of Linguistics. Phonological, Morphological, Syntactic, Semantic, Paralinguistic and Pragmatic sub-systems of human language. Understanding basic principles of Phonetics. Application of phonetics in the assessment of communication disorder.

SLT 415: Medical Conditions Amenable to Speech-Language Therapy (1 Unit C: LH 15)

Learning Outcomes

At the end of this course, students should be able to:

1. describe assessment process for children with speech disorders such as autism spectrum disorders and so on;
2. explain assessment process for adults with swallowing difficulty;
3. explain causes of some neurogenic speech-language disorders across the board; and
4. demonstrate some intervention skills in management of specific speech-language disorders.

Course Contents

Etiology, assessment, treatment, and management of children with autistic spectrum disorders. Evaluation and treatment of swallowing disorders in children and adults. Anatomy and physiology of the normal swallow will be discussed. Videoflouroscopic records of abnormal swallows will be reviewed. Study of etiology, assessment, treatment, and management of children and adults who exhibit dysfluent speech-language patterns. An overview of the nature and causes of pediatric language disorders across clinical population and age groups. Provides a basic understanding of theoretical frameworks, identification protocols, and general assessment in intervention approaches.



SLT 416: Student Teaching Clinical Internship**(2 Units C: PH 90)****Learning Outcomes**

At the end of this course students should be able to:

1. identify pupils/students who have speech-language disorders in a school population;
2. develop speech-language correction programme for such pupils/students;
3. discuss with school personnel and parents the need for engaging concerned pupils/students in speech-language correction programme; and
4. present a report on speech-language activities they undertook during the internship.

Course Contents

Supervised practicum as a speech-language pathologist/therapist in a public school setting. Certification of Speech-Language Pathologist/Therapists. Placements of students in relevant Units, Centers, Clinics, Departments in conjunction with the Education Field Placement office. Demonstration of students' clinically acquired knowledge and skills in school setting (a mock working experience). Demonstration of skills in identification, assessment and rehabilitation of pupils/students with speech-language disorders. Application of students' ability to transfer classroom/laboratory experiences to community service delivery.

AUD 409: Aural Rehabilitation**(2 Units C: LH 30)****Learning Outcomes**

At the end of this course, students should be able to:

1. explain some terminologies commonly used in aural rehabilitation;
2. describe the history of aural rehabilitation;
3. express some connections between hearing loss and speech-language disorders;
4. list some amplification devices often used in aural rehabilitation; and
5. explain the use of specific rehabilitation technologies/devices.

Course Contents

History of aural rehabilitation. Early aural rehabilitation centers. Hearing loss and its attendant communication disorder. Development of listening assistive technology (hearing aids). Types of amplification devices. Use of amplification devices. Maintenance of amplification devices. Audiological assessment of hearing loss. Prescription and fixing of amplification devices. Advent of the cochlear implant. Auditory training across the span, Speech training across the span.

SLT 417: Entrepreneurship in Speech-Language Therapy**(1 Unit C: LH 15)****Learning Outcomes**

At the end of this course, students should be able to:

1. explain what entrepreneurship is about;
2. recall common concepts or terms in entrepreneurship;
3. identify some business opportunities available in Speech-Language Therapy practice;
4. express how to develop feasibility study on Speech-Language therapy based business ideas; and
5. explain some pitfalls to avoid in his/her proposed business.



Course Contents

Concepts of entrepreneurship. Identification of business opportunities in Speech-Language Therapy. Strategies for exploiting business opportunities in Speech-Language Therapy. Political, socio-cultural, economic and legal environment of business activities in Nigeria. Developing business plans. Conducting feasibility study on identified business opportunities. Sourcing for funds. Starting a business. Business registration process.

SLT 418: Augmentative and Alternative Communication Systems (1 Unit C: LH 15)

Learning Outcomes

At the end of this course, students should be able to

1. describe augmentative and alternative communication systems;
2. explain their relevance in Speech-Language Therapy practice;
3. describe the assessment procedures for recommending the augmentative and alternative communication devices; and
4. list some specific augmentative and alternative devices for specific speech-language disorders.

Course Contents

Definitions and types of augmentative and alternative modes or devices. Speech-Language (communication disorders) and augmentative and alternative devices. Voice production and augmentative and alternative devices. Cognitive, psycho-social, educational, physical, and communicative-linguistic factors of individuals across the life span with little or no functional speech and language. Assessment of the presented cases. Considerations for appropriate devices and management issues.

SLT 419: Cleft Palate/Lip and Cerebral Palsy

(2 Units C: LH 30)

Learning Outcomes

At the end of this course, students should be able to:

1. explain what cleft palates and lips are;
2. state causes of cleft palates and lips;
3. discuss socio-cultural problems associated with cleft palates and lips;
4. express therapies for speech-language rehabilitation of cleft patients;
5. describe cerebral palsy;
6. illustrate causes of cerebral palsy;
7. demonstrate speech characteristics of cerebral palsy; and
8. discuss correction measures for cerebral palsy patients.

Course Contents

Definitions of cleft palates and lips. Types of cleft palates and lips. Causes of cleft palate and lips. Socio-cultural challenges faced by cleft patient. Surgery and correction of cleft palates and lips. Post surgery recovery of cleft patient. Speech-language therapies for cleft patients. Causes of cerebral palsy. Cognitive and neurological characteristics of cerebral palsy. Cerebral palsy speech. Therapies for managing cerebral palsy speech.



SLT 410: Clinical Work in Speech-Language Therapy

(1 Unit C: LH 45)

Learning Outcomes

At the end of this course, students should be able to:

1. demonstrate the procedures for assessing speech-language patients in a clinical setting;
2. write clearly the type, extent and cause of the assessed speech-language disorder;
3. develop the therapeutic plan for rehabilitating the patient;
4. record the intervention progress; and
5. present the treatment efficacy report.

Course Contents

Clinical practice outside students training institution whereby they can demonstrate knowledge and skills they have learnt and also to gain more clinical experiences in some community based practicing settings. Assigning students to approved hospitals or Speech-Language clinics where they are given the opportunity to evaluate patient, plan treatment programmes and carry out the treatment of patients. Supervised clinical practice in the treatment of speech, language, and hearing disorders with various clinical participants at the Speech-Language-Hearing Clinic. Development of treatment plans and clinical reports will be required. Students will be provided with supervision appropriate to their level of experience and in accordance with the Medical Rehabilitation Therapists Board (MRTB) standards.

Recommended Settings for Clinical Attachment

Speech-Language Clinics in accredited or approved public and private hospitals, training institutions, departments or approved private speech-language clinics.

PST 503: Rehabilitation and Functional Training

(2 Units C: LH 30)

Learning Outcomes

At the end of the course, students should be able to:

1. identify different hearing devices and implants;
2. demonstrate knowledge of other members of the rehabilitation team vis-a-vis their role in rehabilitation and functional training;
3. identify the appropriate hearing aids based on clinical finding, affordability, ergonomics and choice of the patients;
4. demonstrate ability to work as a team member in the rehabilitation programme involving other specialists;
5. list out training plans for parents or care givers on the procedure of using and maintaining hearing devices; and
6. demonstrate ability to determine other specialised needs of the elderly patients undergoing audiology rehabilitation.

Course Contents

Functional assessment and activities of daily living. Uses of various hearing devices such as hearing aids. Assistive devices. Bone-anchored hearing aids. Cochlea and Brain-stem implants. Physiotherapy. Occupational therapy. Audiology. Medical Social Work. Vocational and Community-Based Rehabilitation.



SLT 511: Special Topics Seminar in Speech-Language Pathology (2 Units C: LH 30)

Learning Outcomes

At the end of this course, students should be able to:

1. state some current trends or issues in Speech-Language Therapy practice or allied medical professions;
2. discuss the implications of some of current trends to Speech-Language Therapy or allied medical professions;
3. identify a particular trend or issue and present a position paper or seminar on it; and
4. demonstrate in-depth understanding, literature search and reflections on presented trend/issue.

Course Contents

Independent study and group discussions. Inculcating in students the ability to identify current trends and issues in the allied health profession relating to: i. philosophies and methods of treatment in general rehabilitation and in each medical rehabilitation profession, ii. examining problem and issues in rehabilitation ethics; iii. administrative topics in rehabilitation and many other. Each student will be responsible for selection of topic that must highlight issues relevant to the programme. Students are admitted and scheduled for presentation. Each topic for presentation shall be approved by the faculty through the course coordinator.

SLT: 512 Articulation Disorders and Multilingualism

(2 Units C: LH 30)

Learning Outcomes

At the end of this course, students should be able to:

1. discuss the structures of human speech production apparatus;
2. list various malformations or diseases that may occur in the speech production organs;
3. state how malformations or diseases affect human speech production;
4. express therapies needed for correcting articulation disorders;
5. explain what bilingualism is;
6. list effects of bilingualism on speech-language development; and
7. illustrate interventions for challenges of bilingualism.

Course Contents

Definitions of articulation disorders. Types of articulation disorders. Causes of articulate disorders. Assessment of articulation disorders. Therapies for articulation disorders. Definitions of bilingualism. Nature of bilingualism. Effect of bilingualism on speech-language development and use. Prevention of bilingualism. Therapies for correcting effects of bilingualism.

SLT 512: Project

(3 Units C: PH 135)

Learning Outcomes

At the end of the project, students should be able to;

1. demonstrate their ability to identify topical issues or researchable topics in rehabilitation studies;
2. present knowledge/skills in executing their project topics;
3. demonstrate their capability to undertake independent (research) studies; and
4. present quality dissertations.



Course Contents

Each student will be guided by a supervisor. The choice of a project will be in an area in which the students is interested within the rehabilitation profession into which the student was admitted. This will lead to a dissertation, which will be presented for assessment during the final examination.

SLT 513: Communication Skills and Ethics

(2 Units C: LH 30)

Learning Outcomes

At the end of the course, students should be able to:

1. identify and understand cultural competencies, education techniques, ethics, law and administration in rehabilitation studies; and
2. identify and apply various interviewing processes and listening techniques in rehabilitation studies.

Course Contents

Definition of different supervisory styles. Organisational communication pattern of work goal, directed, passive; complaint, aggressive, hostile and many other. Communication procedure- role clarity performance review, feedback mechanism; small group communication, one-to-one communication. Resolution of interpersonal conflict through systematic procedure. Team work within the health delivery system. Basic ethical issues such as euthanasia, abortion and right of patients. Entrepreneurship in health care. HIV/AIDS. Cancers and many others. Professional role in multidisciplinary collaborations in clinical practice and research. Inter Professional rivalries and advancements as it affects medical rehabilitation practice in clinical setting.

SLT 513: Autism Spectrum Disorders (ASD)

(1 Unit C: LH 15)

Learning Outcomes

At the end of this course, students should be able to:

1. explain what autism spectrum disorders are;
2. list types of autism spectrum disorders;
3. point out similarities and differences among types of autism spectrum disorders;
4. explain characteristics of specific autism spectrum disorders;
5. describe interventions for managing psycho-social challenges of patients with autism spectrum disorders; and
6. express therapies for correcting autism spectrum disorders.

Course Contents

Definitions, types of autism spectrum disorders- Asperger Syndrome, Rett Syndrome, Childhood Disintegrative Disorder and Pervasive Developmental Disorder. Characteristics of specific autism spectrum disorders. Causes of autism spectrum disorders. Social and communication challenges associated with autism spectrum disorders. Physiological challenges of autism spectrum disorders. Assessment techniques for autistic children or patients. Therapeutics procedures for rehabilitating autistic children.



SLT 514 Dysphagia and Aphasia**(2 Units C: LH 30)****Learning Outcomes**

At the end of this course, students should be able to:

1. state the characteristics of dysphagia;
2. describe swallowing characteristics associated with dysphagia;
3. explain some feeding strategies for dysphagia;
4. itemise symptoms of aphasia;
5. list language problems associated with aphasia; and
6. discuss some procedures for managing aphasia.

Course Contents

Definitions and nature of dysphagia (swallowing or feeding difficulty). Causes and symptoms of dysphagia. Understanding the brain damage underpin of dysphagia. Speech-language challenges of aphasia. Assessment and classification of motor/neural disorders. Management and treatment of dysphagia patients. Therapies for rehabilitating speech-language skills. Feeding exercise for dysphagia patients. Definitions and nature of aphasia. Causes and symptoms of aphasia. Assessment of aphasia patients. Therapies for aphasia patients.

SLT 515: Voicing and Fluency Disorders**(2 Units C: LH 30)****Learning Outcomes**

At the end of this course, students should be able to:

1. list types of voice disorders;
2. itemise the characteristics of voice disorders;
3. state causes of voice disorders;
4. illustrate procedures for management of voice disorders;
5. explain what fluency disorders are;
6. list types of fluency disorders;
7. discuss some psychosocial problems associated with fluency disorders; and
8. describe therapeutic procedures for correcting fluency disorders.

Course Contents

Definitions of voice disorders. Types of voice disorders. Diseases and malformation of larynx and pharynx resulting in voice disorders. Alaryngeal speech characteristics. Assessment of voice disorders. Therapies for voice disorders. Definitions of fluency disorders- stuttering/stammering. Types of voice disorders. Causes of fluency disorders. Characteristics of fluency disorders. Social and emotional problems associated with fluency disorders. Assessment of fluency disorder. Therapies of fluency disorder.

SLT 516: Professionalism and Speech-Language Therapy**(1 Unit C: LH 15)****Learning Outcomes**

At the end of this course, students should be able to:

1. trace the history and growth of Speech-Language Therapy profession in time and space;
2. recognise the contributions of past leaders in the profession;
3. state ethics of the profession;
4. identify the regulatory bodies of the profession and their roles; and



5. demonstrate his/her obligations to the profession.

Course Contents

History of Speech-Language Therapy. Scope of practice of Speech-Language Therapy. Education programmes for Speech-Language therapists. Ethics of Speech-Language Therapy practice. Roles of the regulatory bodies in the operations of the Speech-Language (Licensure and Practice Supervision), Therapy practice. Challenges of Speech-Language Therapy in a developing country. Speech-Language Therapy in allied health professions. Advocacy in Speech-Language Therapy.

Minimum Academic Standards

Equipment

1. Audio Recorder
2. Video Recorder
3. Models
4. Mirror
5. Tongue Depressor
6. Reinforcers
7. Reference Materials
8. Adaptive Communication Switches, Infrared Switches
9. Sound Measuring Apparatus/ Decibel Meter
10. An Electroglottograph (EGG)
11. Diagnostic Stroboscopes
12. Tablet Computer
13. Voice Synthesiser
14. Analytical Software
15. Medical Software
16. Office Software
17. Alternative Augmentative Communication Generation Materials, CV, VC, CVC, CVCV Cards
18. Visual Aids for Children
19. Pre-school Vocab and Question Cards
20. Picture Flash Cards
21. Picture Arrangement Kits
22. Verb Flashcards for Speech Therapy
23. Sign Language Flash Cards
24. Articulation Story Books
25. Talking Toys
26. Legos
27. Electrolarynx/Artificial Larynx
28. Speech Trainers
29. ALFA Aphasia Assessment Tool Kit
30. Melody Intonation Therapy (MIT)
31. Dysphagia Diet Protocols (DDP)
32. AliMed Swallowing Image Chart
33. Swallowing Guides



Staffing

1. Academic Staff

Three (3) Professors/Readers or Associate Professors

Five (5) Senior Lecturers

Five Lecturer 1 and below

2. Non-teaching staff

One (1) Senior Administrative Officer

Four (4) Clerical Staff

3. Clinical /Support staff

Two (2) Speech-Language Therapists

Two (2) Clinic Assistants

Two Sign Language interpreters

Classroom, Laboratories, Workshops, and Office Space

Classroom

The standard requirement of 0.65m^2 per full-time student should be maintained. Thus the minimum total space requirement for a faculty or department shall be the product of its total full time equivalent student enrolment (FTE) and the minimum space requirement per full-time equivalent i.e. (FTE) 0.65m^2 .

Office

In this respect, each academic staff should have an office space of at least 25 square metres taking into cognisance the status/cadre of the staff

In addition, there should be for the Faculty, a Dean's office and for each Department a Head of Department's office with attached offices for their supporting staff as specified below in m^2 :

| | | |
|----------------------------------|---|-------|
| Professor's office | - | 18.50 |
| Head of Department's office | - | 18.50 |
| Tutorial teaching staff's office | - | 13.50 |
| Other teaching staff space | - | 7.00 |
| Technical staff space | - | 7.00 |
| Secretarial space | - | 7.00 |
| Staff research laboratory | - | 16.50 |
| Seminar Space/per student | - | 1.85 |
| Laboratory space (per student) | - | 7.50 |

Library

Provision of appropriately designed buildings for:

1. Conventional Library and

2. Virtual Library.

Required books, journals, computers tables, chairs and many others.

Availability of the required staff such as:

1. Librarians,

2. Library administrative and support staff.

