**FACULTY OF HEALTH SCIENCES AND TECHNOLOGY**

**DEPARTMENTS: HEALTH ADMINISTRATION AND MANAGEMENT**

**MEDICAL LABORATORY SCIENCES**

**MEDICAL RADIOGRAPHY AND RADIOLOGICAL SCIENCES**

**MEDICAL REHABILITATION**

**NURSING SCIENCES**

**DEAN: PROFESSSOR K. K. AGWU**

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**Faculty of Health Sciences and Technology Building**

**DEPARTMENT OF HEALTH ADMINISTRATION AND MANAGEMENT**

Post-graduate Diploma (PGD)Programme

in

Health Economics, Management and Policy

**APPROVED SUPERVISORS**

1. Dr (Mrs.) Ijeoma Okoronkwo: BSc, MBA, MSc, DLSHTM, PhD Head of Department
2. Prof Obinna Onwujekwe: MBBS, MSc, Cert HMGT, PhD, DLSHTM
3. Prof Benjamin SC Uzochukwu, MBCHB, FWACP, MPH, Cert HPA Joint Appointment
4. Assoc. Prof. Douglas E. Nwagbo, BSc, MSc, DLSHTM. Joint Appointment

**PHILOSOPHY**

There is lack of capacity in health management, economics and policy in Nigeria and most sub-Saharan African (SSA) countries. There is also the lack of adequately trained as well as academically equipped health management professionals to man management positions in the ministries of health, health organizations and services in Nigeria. These imply that the country and actually most of the countries in the SSA sub-region lack the capacity for health system analysis; health system management; health economics and policy; and overall health management techniques. These are essential skills that are required to improve the health system and ensure that the country attains and maintains the Millennium Development Goals (MDGs), institutionalize an efficient and equitable health sector reform programme and ultimately improve the health status of the people and achieve Universal Health Coverage [UHC].

Evidence show that the greatest problem preventing appropriate delivery of care, improved access to care and the financial viability of the health system has been the scarcity of trained and seasoned health care managers. Evidence also indicates increasing need for trained health economists/managers by the civil society organizations in attempt at reforming and improving the Nigerian health system. As a result, it has become necessary and important to provide relevant professional training in order to develop health management experts and health economists with high academic and professional skills to provide effective leadership in the health services delivery at both the public and private health sectors

The phenomenon of lack of management acumen within our healthcare system has become so obvious that persons heading our health institutions and healthcare services are hardly versed in the realm of health management, economics and policy for that matter, resulting in poor, ineffectual and uncoordinated healthcare delivery system. This is partly one of the reasons that the Nigerian healthcare system was ranked by the World Health Organization in 2000 to be one of the worst in the world.

The demand for health managers and administrators has been on the increase since the recent health reform programmes engaged at various governmental levels and partly sponsored by the international community commenced. Until recently, both public and private health institutions were being managed by non-processional health managers, hence the enduring crisis of misallocation of resources, lack of adequate health planning and diagnosis that has plagued the National healthcare delivery system.

The manpower need for health economists as well as health systems and policy analysts also has remained on the increase especially with the recent health reform programmes in Nigeria and the rest of SSA sub-region. More so, international and civil society organizations are on constant demand for health economists and health system analysts to develop policies and implement various health reform programmes in the country as well as evaluate and provide economic evidence for improving diverse health programmes. The need for health economists run through the desire to build capacity to accomplish the demand for appropriate allocation of scarce resources, health management effectiveness and relevant decision making and performance applications to the health industry to maximize the health and well being of the citizenry.

There is thus an urgent need to initiate a post-graduate programme in health economics, management and policy to help fill the vacuum created by the absence of the relevant professionals that are required to improve the healthcare system. The inter-related nature of the disciplines implies that they could be offered as an integrated package to the students for a holistic acquisition and retention of knowledge required to improve the performance of the health system. The desire to accomplish appropriate fiscal policies and governmental finance of the health industry especially with recent reform programmes engaged at the various governmental levels has also informed the initiation of this programme.

The PGD programme other than being a preparatory programme for Master’s degree in Health Economics, Management and Policy is designed to give the participants requisite knowledge and techniques in health economic analytic problem solving, policy analysis and management. It will also enable students to develop their skills and attitudes for effective and efficient performance of their duties in managerial positions in the health industry.

**OBJECTIVES**

Aim: The post-graduate programme in Health economics, management and policy is designed to provide basic and relevant training for effective leadership and analytic problem solving capacity for the graduates, so that they improve the effectiveness, efficiency and equity of the health system.

**SPECIFIC OBJECTIVES**

1. To provide training in health economics, health policy and health management techniques required of managers and policy makers in the health sector.

2. To provide specialized training and techniques required for effective planning and analysis of contemporary health economic issues.

3. To broaden the intellectual base for optimal resource allocation in the ever-evolving health sector in a developing country.

4. To provide students with frameworks which will enable them to understand and analyse health systems and policies.

5. To improve the strategic management know-how and training for health care executives to enable efficient and effective health delivery system.

6. To appreciate the underlying differences between types of organizational structures for health systems and key issues for achieving the goals of health systems for each type.

7. To develop health experts capable of engaging in health systems research and analysis and ultimately improving the performance of health systems.

**SCOPE**

The programme will cover the basic aspects of the disciplines of health economics, health policy, health management and health administration. The programme will also cover introductory epidemiology including the control of common communicable and non-communicable diseases, organization of health systems including hospitals and health sector reform issues.

**ENTRY REQUIREMENTS**

For a candidate to qualify for admission into the postgraduate diploma, s/he must posses the following qualifications:

1. A University Degree in Medicine, Nursing, and Pharmacy or in a related field from University of Nigeria or any other recognized University in the area.
2. Candidates with at least third class degrees in Economics, Law and in any of the Social Sciences or in any of the Management Sciences.
3. A holder of a minimum of upper credit in the Higher National Diploma from a recognized institution provided the university matriculation requirements are satisfied.

**MODE OF STUDY**

By course work to be examined in written papers together with research work to be presented in a project report where course work predominates over research and constitutes not less than ¾ of the total units.

**A university mandatory regulation of 75% attendance to all lectures is required to sit for any course examinations.**

**DURATION OF PROGRAMME**

The programme will run for a minimum of twelve [12] calendar months and maximum of twenty four [24] calendar months. Full-time Diploma: Minimum of two (2) semesters and a maximum of four (4) semesters.

**SCORING AND GRADING**

**Scoring and grading of courses shall follow the guideline in which the percentage scores are interpreted in letter grade [A – C &F] and grade points [O, 3 – 5] as displayed in the table below:**

|  |  |  |
| --- | --- | --- |
| **Percentage Score** | **Letter Grade** | **Grade Point** |
| **70 – 100** | **A** | **5** |
| **60 – 69** | **B** | **4** |
| **50 – 59** | **C** | **3** |
| **0 – 49** | **F** | **0** |

The minimum pass mark for any course work is 50%;

30% shall constitute Continuous Assessment and 70% shall be from Examination score.

Candidates are required to re-register any failed course.

**EMPLOYMENT OPPORTUNITIES**

There are excellent employment opportunities in various arms of the health sector. The graduates could be employed as outcomes analysts in pharmaceutical industries; health economists in Ministries of Health and Development agencies; health service administrators and managers in hospitals and other health care organizations; in academia if they already have advanced post-graduate training in other relevant fields; programme managers by bilateral and multilateral organizations e.g. the World Health Organization etc.

**STRESS AREAS**

General economics - 0

Health Management - 1

Health Economics - 2

Health Policy - 3

Research Methods - 4

Epidemiology - 5

Biostatistics - 4

Demography - 6

**Project - 7**

**COURSE OUTLINE**

**1st Semester**

**Course code Course title Unit**

**Compulsory courses**

**HEM 501 Microeconomics and Macroeconomics 3**

**HEM 513 Introduction to Health Facility planning 2**

**HEM 515**  **Management of Health Services and Organizations 3**

**HEM 535 Introduction to Health Systems and Policies 3**

**HEM 553 Basic Epidemiology and Demography 2**

**Total 13**

**2nd Semester**

**Course code Course title Units**

**Compulsory courses**

**HEM 514 Basic Health Planning and Management 3**

**HEM 522 Introductory Health Economics 2**

**HEM 546 Research Methods and Biostatistics 2**

**HEM 578 Project work 4**

**Elective courses 2**

**13**

**Elective Courses (to choose only one**)

**HEM 516 Health Management Information Systems 2**

**HEM 526 Health Care Financing and Budgeting 2**

# **COURSE DESCRIPTION**

**HEM 501: MICRO AND MACROECONOMICS 3 units**

Economics: What it is all about: scarcity, choice and decision making, basic concepts and principles in economics, opportunity cost. An intensive study of the theory of demand; law of demand and the market demand curve, the consumer behavior, utility function, demand function; indifference curve, the revealed preference; and new developments in the theory of demand. The theory of supply, law of supply and market supply curve, market equilibrium, price and quantity, price ceilings, floors and controls. Elasticity: price elasticity of demand income elasticity of demand, cross elasticity of demand and price elasticity of supply. Market structures: perfect competition, monopoly, monopolistic competition and oligopoly. Consumption function hypothesis: the absolute income, relative income, permanent income, wealth hypothesis. Investment function: the behaviour of the firm; the marginal efficiency of capital the marginal efficiency of investment, the accelerator. What is money and functions of money? Monetary and fiscal policies: Inflation: inflationary distortions in saving and investment, hyperinflation, deflation, unemployment, forms of unemployment. Gross domestic product and Gross national product, nominal GDP and real GDP.

**HEM 513: INTRODUCTION TO HEALTH FACILITY PLANNING 2 units**

**Health Service Organizations:** Health Service in Nigeria and in other countries. **Project Planning Team:**  The role and organization of the Project Planning team. **Operational Policies and Pattern of Care:** Operational Policies at Various Levels. Design Implications at Various Levels; Whole Hospital Planning Strategies: Spaces: Environment: Energy: Organization and Handling of Data for Briefing.

**Health Building Attributes:** Efficiency and Cost. Effectiveness, Flexibility Expandability; Therapeutic Environment; Cleanliness and Sanitation; Accessibility; Controlled Circulation; Aesthetics; Security/Safety and Sustainability. **The Design and Building Process**: Providing healthcare Buildings: Standards and Systems; Commissioning and Evaluation; Operation and Maintenance of Complex Buildings.

**HEM 514: BASIC HEALTHCARE PLANNING AND MANAGEMENT 3 units**

A review of administrative and management process. Review of functions and principles of Management. Principles and benefits of planning. Planning and organizing health services. Implementation and evaluation of health activities programmes. Health Programme Planning, Implementations of Monitoring and Evaluation. Health Needs Assessment/Community Diagnosis, Introduction to some analytic and non-analytic health planning techniques. The nature of management and understanding the roles of managers. Organizational development and change. Management of some health establishments in Nigeria–case studies. Community diagnosis, Programme implementation and Evaluation; Introduction to some analytic health planning techniques. Principles of monitoring and evaluation. Organizational development and change. The manager and his work authority, relationship,

leadership, power and accountability. Management of some health establishments in Nigeria-case studies.

**HEM 515: MANAGEMENT OF HEALTHCARE SERVICES AND ORGANIZATIONS 3 units**

This course is designed to cover different aspects of management which includes human resources management, financial management and materials management. Principles and functions of management, evolution of Management theory and some theories of management , planning function and management decision making, setting of organizational objectives and goals. Organization function and formal and informal organizational structure and design, line and staff function and Role of authority, responsibility, delegation and style of leadership, accountability, Vertical and Horizontal coordination. Managerial skills and competencies – communication, Decision making etc. The nature of management and understanding the roles of managers. The different aspects of management which include human resources management, financial and materials management .Team building and group effectiveness. Introduction to quality management in Healthcare.

**HEM 516: HEALTH MANAGEMENT INFORMATION SYSTEMS 2 units**

Overview of Health Management Information Systems. Analysis, design and installation of Management information systems in health care organizations. The National Health Information System at the local, State and Federal levels. Computer applications for Management analysis of various health care programmes. Data storage. Retrieval and analysis.

**HEM 522: INTRODUCTORY HEALTH ECONOMICS 2 units**

Basic Concepts and Principles of Health Economics with particular reference to choice and decision making in health care organizations. The special nature of health and health care. The principles of demand, supply and markets in the health economy. Market failures. General review of methods of economic evaluation and methodologies of cost-effectiveness analysis (CEA), cost-benefit analysis (CBA), cost-utility analysis (CUA) and cost-minimization analysis (CMA). Use of economic analysis for decision making and resource allocation. Economic analysis of alternative methods of delivering and financing health care. Equity analysis.

**HEM 526: HEALTH CARE FINANCING AND BUDGETING 2 units**

Evolution of the budget process, theory and practice of budgeting. Identification of different types, roles and demands of the budget. Cardinal function of the budgets as an instrument of national, socio-economic policy formulation and implementation. Sources of revenue and purposes of governmental expenditures. Budget cycles, Budget preparation, Approval and execution, politics of resource allocation with emphasis on revenue sharing, programme budgeting. Comparison and evaluation of alternative Health care financing schemes in developed and developing countries and in the free enterprises, command and centrally planned economies. The Medium-term sector strategy (MTSS) and medium-term expenditure framework (MTEF) for health resource allocation and financing.

**HEM 535: INTRODUCTION TO HEALTH SYSTEMS AND POLICIES 3 units**

Introduction to Health policy,/Health Policy framework. Functions and goals of Health Systems. Evaluation of health services in Nigeria. Nigeria Healthcare Delivery Systems [new] with Policy implication. Introduction to International Healthcare Systems; Comparative Analysis [new]; Stewardship and Governance in Healthcare [Addition]; Assessing Health System Performance; Health Systems Reforms/Methods for evaluating HSR; Universal Coverage as a key health System goal [new]; Health Systems regulation [new]; Role of Private/Voluntary Sector in health systems [new]; Health Policy Analysis: Introduction; Analysis and choices among contending health policy initiatives; Comparative Assessment of Political, Sociological and Economic analysis of Health policy issues. Health Policy Planning, Formulation, Implementation and Evaluation. Health Systems Strengthening: Policy developed to strengthen the health systems. Roles and functions of the three tiers of government with policy implications.

**HEM 546: RESEARCH METHODS AND BIOSTATISTICS 2 units**

The essence of this course work is to orient students to different research and designs and to equip the participants with appropriate skills required for writing their research projects. Aspects to be covered during the course will include types of research investigation, purpose of research, the research process – selection of problem, objectives, literature review, variables, assumptions, hypothesis, research design, selection of research method research ethics, issues in writing up research [integrity and plagiarism]. Basic statistical principles, collection of data, summarization and presentation of data, basic principles of data analysis.

HEM 553: BASIC EPIDEMIOLOGY AND DEMOGRAPHY 2 units

Definition and description of common epidemiological terms and principles. Measuring disease and illnesses. Principles of various epidemiological study designs and their applications. The distribution and determinants of common communicable and non-communicable causes of diseases and illnesses in Nigeria. This will involve the application of epidemiological principles to the control of communicable and non-communicable diseases as well as health related events. Basic concepts in the principles of transmission and control of communicable and non-communicable diseases. Disease burden and the social determinants of Health Epidemiological transition. Meaning and Nature of demography. Source and types of demographical data, population structure and dynamics, presentation of demographic data and rates. Basic measures of Fertility; rates of natural increase, population growth and estimates, morbidity and mortality rates.

**HEM 578 PROJECT WORK** **4 units**

Every student is expected to write a project of acceptable standard on a topic chosen from the field of Health Economics, Health Management or Health Policy. Each student, for the purpose of this aspect of the course, is assigned a Supervisor from the academic staff of the department.

Master of Science (M.Sc.) Programme

Health Economics, Management and Policy

**PHILOSOPHY**

The epi-centre of philosophy of the programme is hinged on the need to produce policy makers and managers in the health sector as well as academics roundly grounded in an integrated manner in the inter-related fields of health economics, management and policy. Hence, the inter-related nature of the disciplines of health economics, management and policy implies that they could be offered as an integrated package to the students in the MSc for a holistic acquisition and retention of knowledge required to improve the performance of the health system. However, in the PhD, there will be specialization in one of the disciplines.

There is lack of capacity in health management, economics and policy in Nigeria and most sub-Saharan African (SSA) countries. There is also the lack of adequately trained as well as academically equipped health management professionals to man management positions in the ministries of health, health organizations and services in Nigeria. These imply that the country and actually most of the countries in the SSA sub-region lack the capacity for health system analysis; health system management; health economics and policy; and overall health management techniques. These are essential skills that are required to improve the health system and ensure that the country attains and sustains the Millennium Development Goals (MDGs), institutionalize an efficient and equitable health sector reform programme and ultimately improve the health status of the people and move towards Universal Health Coverage [UHC].

Evidence show that the greatest problem preventing appropriate delivery of care, improved access to care and the financial viability of the health system has been the scarcity of trained and seasoned health care managers. Evidence also indicates increasing need for trained health economists/managers by the civil society organizations in attempt at reforming and improving the Nigerian health system. As a result, it has become necessary and important to provide relevant professional training in order to develop health management experts and health economists with high academic and professional skills to provide effective leadership in the health services delivery at both the public and private health sectors

The phenomenon of lack of management acumen within our healthcare system has become so obvious that persons heading our health institutions and healthcare services are hardly versed in the realm of health management, economics and policy for that matter, resulting in poor, ineffectual and uncoordinated healthcare delivery system. This is partly one of the reasons that the Nigerian healthcare system was ranked by the World Health Organization in 2000 to be one of the worst in the world.

The demand for health managers and administrators has been on the increase since the recent health reform programmes engaged at various governmental levels and partly sponsored by the international community commenced. Up until recently, both public and private health institutions were being managed by non-professional health managers, hence the enduring crisis of misallocation of resources, lack of adequate health planning and diagnosis that has plagued the National healthcare delivery system.

The manpower need for Health Economists as well as Health Systems and Policy Analysts also has remained on the increase especially with the recent health reform programmes in Nigeria and the rest of SSA sub-region. More so, international and civil society organizations are in constant demand of health economists and health system analysts to develop policies and implement various health reform programmes in the country as well as evaluate and provide economic evidence for improving diverse health programmes. The need for health economists run through the desire to build capacity to accomplish the demand for appropriate allocation of scarce resources, health management effectiveness and relevant decision making and performance applications to the health industry to maximize the health and well being of the citizenry.

There is a dearth of opportunities for training in areas of health economics, policy and management in not only Nigeria, but in the rest of SSA region. The few available opportunities that are found mostly in South Africa are inadequate to cater for the needs of the countries and are not affordable to many desiring students. This also implies that there is low numbers of trained manpower in health economics, management and policy that are able to provide such training to other people in Nigeria. Hence, there is the potential for University of Nigeria to become the leader in this area not only in Nigeria but in the SSA sub-region

There is thus an urgent need to start the MSc and PhD programme in health economics, management and policy to help curb the weaknesses in the management of the health system engendered by the absence of the appropriately trained managers in the health sector, which is pre-requisite for improving the healthcare system. In addition, the programme will also produce a critical mass of academics and experts required to teach the courses to other people within the University system and to undertake research activities that will provide the evidence-base for improving the performance of the health system.

**OBJECTIVES OF THE PROGRAMME:**

The MSc programmes in Health Economics, Management and Policy is designed to provide professional and relevant training for effective management of the health sector as well as capacity building in the educational sector for training and research. The set-out objectives of the programme are: to provide advanced training in health economics, health policy and health management techniques required for managers and policy makers in the health sector as well as to the academia; to provide specialized training and techniques required for effective planning and analysis of contemporary health sector issues; to broaden the intellectual base for optimal resource allocation in the ever-evolving health sector in a developing country; to provide students with frameworks which will enable them to understand and analyse health systems and policies; to improve the strategic management know-how and training for health care managers to enable the institution of equitable, efficient and effective health system; to develop health experts capable of engaging in health systems and research and analysis and ultimately improving the performance of health systems; and to develop a critical mass of academics that will propagate capacity building and research in health economics, management and policies.

**SCOPE**

The programme will cover the advanced aspects of the disciplines of health economics, health policy, health management and health administration. The programme will also cover epidemiology including the control of common communicable and non-communicable diseases, and advanced principles of organization of health systems including hospitals and health sector reform issues.

**ENTRY REQUIREMENTS**

To be admitted into the MSc degree programme, candidate should be holders: of a first degree in health administration and management, health economics, management and policy from a recognized university or a degree in a related field with a minimum GPA of 2.5 (second class lower) on a 5 point scale; degree in Medicine, Nursing, Pharmacy or other allied healthcare disciplines (with relevant experience of 3 years or more in Health Planning, Economics, Management or Policy); a postgraduate diploma with credit in Health Economics, Management, Policy; or in any other related field; and a first degree in Medicine, Pharmacy and other bio-medical sciences from University of Nigeria; and other graduates with at least 3 years cognate managerial experience.

**MODE OF STUDY**

The MSC programme will be by course work to be examined in written papers together with research work to be presented in a Dissertation. The students will face an oral examination/defence before an external examiner. In order to qualify for the M.Sc. degree, candidates are required to register maximum of 28 units of courses. **A University mandatory regulation of 75% attendance to all lectures is required to sit for any Course examination and Continuous Assessment**

**DURATION**

The duration of the MSc programme shall be a minimum of eighteen [18] calendar months and a maximum of thirty-six [36] calendar months. Full-time will be for a minimum of eighteen [18] calendar months and part-time will be for a minimum of twenty [24] calendar months. Students unable to complete their work within the specified period shall be discontinued from the programme.

SCORING AND GRADING:

Scoring and grading of courses shall follow the guideline in which the percentage scores and interpreted in letter grade [A – C &F] and grade points [0, 3 – 5] as displayed in the table below

|  |  |  |
| --- | --- | --- |
| **Percentage Score** | **Letter Grade** | **Grade Points** |
| **70 - 100** | **A** | **5** |
| **60 - 69** | **B** | **4** |
| **50 - 59** | **C** | **3** |
| **0 – 49** | **F** | **0** |

The minimum pass mark for any course work is 50%;

30% shall constitute Continuous Assessment and 70% shall be from Examination score.

Candidates are required to re-register any failed course.

**EMPLOYMENT OPPORTUNITIES**

There are excellent employment opportunities in various arms of research, health and educational sectors. The graduates could be employed as: Outcomes analysts in pharmaceutical industry; Health economists in Ministries of Health and Development agencies; Health service administrators and managers in hospitals and other health care organizations; Lecturers and researchers in the Universities; Research fellows in research institutes; Programme managers by bilateral and multilateral organizations such as the World Health Organization; etc.

**AREAS OF SPECIALISATION**

Health Policy Analysis

Health Systems Research

Health Economics

Health Management

**STRESS AREAS**

Health Management - 0

Health Economics - 1

Health Policy - 2

Health Law - 3

Biostatistics - 4

Epidemiology - 5

Research Methods - 6

Project - 7

**COURSE OUTLINE**

**1st Semester**

**Course code Course title Units**

**Compulsory courses**

PGC and Research Methodology 3

HEM 601 Advanced Health Planning and Management 3

HEM 613 Advanced Health Economics 3

HEM 625 Health Systems and Policies 3

HEM 637 Legal and Ethical Aspects of Health care 2

**Elective courses**  2

**13**

**2nd Semester**

**Compulsory courses**

HEM 612 Health Financing 2

HEM 604 Health Facility Planning 2

HEM 616 Advanced Economic Evaluation 2

HEM 648 Biostatistics 2

HEM 674 Project work 6

**Total 17**

**Elective Courses (to choose only one)**

HEM 651 Advanced Epidemiology 2

HEM 627 Health Sector Reform 2

COURSE DESCRIPTION

**PGC 601: ICT AND RESEARCH METHODOLOGY 3 units**

In-depth research work aimed at acquiring full knowledge and presentations in scholarly writing of the concepts, issues, trends in the definition and development of statistics. Major steps in research: selection of problem, literature review, Design, Data collection, analysis and interpretation, conclusions. Study of various research designs, Historical, Case studies, Surveys, Descriptive, Cross Sectional, Experimental, e.t.c. Analysis, surveys and synthesis of conceptual and philosophical foundations of statistics. Identification of research problems and development of research objectives and hypotheses. Method of project/dissertation writing. Application of appropriate advanced ICT tools relevant for data gathering, analysis and result presentation. Essentials of spreadsheets, Internet technology, Internet search engines, Statistical packages, Principles of Scientific Research. All registered Master’s Degree students must attend a solution-based interactive workshop to be organized by the School of Postgraduate Studies for a practical demonstration and application of the knowledge acquired from the course, conducted by selected experts.

**HEM 601: ADVANCED HEALTH PLANNING AND MANAGEMENT 3 units**

The course will cover definition and concept of Management. Examination of various management theories and principles. Strategic management, Organizational behaviour, Change and change management; Introduction to some analytic and non-analytic health planning techniques viz. Planning Programme Budgeting System (PPBS). Quantitative techniques, Organization and Methods (Q & M), Management by objectives (MBO), Project Management (PM), Project Evaluation and Review Techniques (PERT), Decision making techniques, Managing Services and Queuing theory, Inventory Management problems, Dynamic programming etc. and their relevance to health care delivery; Principles of monitoring and evaluation; Health needs assessment ,Community diagnosis, programme implementation and evaluation. Types of organizational functions, setting of organizational objectives and goals, effective organization-authority, power and delegation, formal and informal organizational structure and design, line and staff function and authority. Human Resources Management, Leadership style and theories, team building, Appraisal/Performance Review. Health Quality Management and Organization Performance Management: Donabedian view, Maxwell 6-dimensions of quality, Total Quality Management, Balanced Score Card. Accounting systems and procedures, accounting documentation and interpretation of financial accounting statements. Nature, compilation, uses and limitations of accounting and financial statements; Accounting data for planning and control. An overview of the organization of health services in different parts of the world. The philosophy of health services and National health services arrangement and responsibilities. Management responsibility in health services delivery. Advanced human resources, financial, and materials management systems.; Analysis, design and the installation of Management information systems in health care organizations. The National Health Information System at the local, State and Federal levels. Computer applications for Management analysis of various health care programmes. Data storage, retrieval and analysis.

**HEM 604: ADVANCED HEALTH FACILITY PLANNING 2 units**

The nature of health care planning: Principles of Healthcare Planning Procedures [international models e.g. Nigeria, U.S.A., UK]; History and Changes in Healthcare. Allocation of Resources at the Strategic levels; Approaches to Planning Complex Systems. Operational policies/design implications: Patterns of Care; Operational Policies at various levels. Whole Hospital Planning Strategies; Space, Environment, Energy, Costs, Organizations and Handling of Data. The Design Brief. Investigation for briefing: A Comparison of Various briefing approaches; and Investigating Method/Developed; an Introduction to Mathematical Techniques and Operations Research. The design and building process**:** Providing Healthcare Buildings. Standards and Systems; Commissioning and Evaluation; Operation and Maintenance of Complex Buildings. Field Work and Seminar

HEM 612: HEALTH FINANCING 1 unit

Health financing functions: resource generation and collection; pooling and purchasing. Different health financing mechanisms. Assessment of health financing mechanisms: equity, efficiency, affordability, accessibility and improvement in quality of services. Health insurance: different types; market failures in health insurance markets. National health financing policy. Health financing research. Concept of financial risk protection; Catastrophic health expenditures. Health Systems Financing: Creating Fiscal Space for Health. Universal health coverage: financial access, physical access and quality of services. Comparison and evaluation of alternative Health care financing schemes in developed and developing countries as well as in the free enterprises, command and centrally planned economies. Examination of the issue of adequacy or otherwise of health care resources as they are currently appropriated. The Medium-term sector strategy (MTSS) and medium-term expenditure framework (MTEF) for health resource allocation and financing.

**HEM 613: ADVANCED HEALTH ECONOMICS 3 units**

Concept of health economics. Economic approach to understanding problems, Demand theories, Nature/characteristics of the good – health, Demand and supply of healthcare goods and services, Understanding healthcare markets, Market failures in health Supplier-induced demand, basic health financing, introduction to methods of economic evaluation, Resource allocation, Health sector reform, Equity and efficiency analysis, External and health sector Inter-sectoral collaboration and health care delivery. Elements of costing and costing systems, budgeting and budgetary control procedures. Public sector budgets and fiscal policies. Internal control in the public sector. Application of financial accounting tools to planning; compilation and reporting of financial activities. Pharmaco-economics. Economics of control of communicable and non-communicable diseases.

**HEM 616: ADVANCED ECONOMIC EVALUATION 2 units**

Advanced methods of economic evaluation: Methodologies and applications of cost-effectiveness analysis (CEA), cost-benefit analysis (CBA), cost-utility analysis (CUA) and cost-minimization analysis (CMA). Use of economic analysis for decision making and resource allocation. Economic analysis of alternative methods of delivering and financing health care. Measuring costs; Financial and economic costs, variable and fixed costs, unit costs, marginal costs, incremental costs. Monetary measures of outcome using the contingent valuation method and the human capital approach. Measuring effectiveness and outcomes; disability-adjusted life years, quality adjusted life years, willingness to pay technique. Average, marginal and incremental cost-effectiveness analysis. Project appraisal techniques; cost benefit and sensitivity analysis.

**HEM 625: HEALTH SYSTEMS AND POLICIES 3 units**

What is a health system? Definitions and boundaries. Concept of systems and basic systems theory; identification of the sectors (National Subsystems) that are relevant to health planning and delivery; identification of the health sector’s subsystems. Functions and goals of health systems. Organisation of the health system and types of services (promotive, curative, rehabilitative and preventive). Policies that have been developed to strengthen/improve health systems. Frameworks to analyse health systems and their performance. Frameworks to analyse health policies and assess their implementation. The role of federal, state and local governments in health services delivery; their power under the constitution and their influence on health care. The emergence and focus on primary healthcare (PHC). Exploration of Health patterns in industrialization and industrialized countries and the effect of the free market system. The health policy framework. Policy implementation. Methods for policy analysis. Medical technologies and devices. Fund collection and pooling. Provision of health services. Purchasing health care. Stewardship. Assessing health system performance. Definition of Policy. Legislative process in policy formulation. Different types of policy. Evolution of health services in Nigeria with policy responses and implications. Roles and functions of the three tiers of government with policy implications. The National health policy and response to diseases and treatment. Primary, Secondary and tertiary health care in the current health policy and Strategy. Intersectoral collaboration.

**HEM 627: HEALTH SECTOR REFORM 2 units**

Concept of Health sector reform. Ideological movements that have led to HSR and developing country health systems such as structural adjustment programmes and globalization. Historical perspectives of Health Sector Reform in Nigeria and around the world. Decentralization. Public-private mix. Contracting out of services. Millennium Development Goals (MDGs). Health Sector Reform Programmes in Nigeria: Federal and state levels. External influences on national HSR. Health Systems Research.

**HEM 637: LEGAL AND ETHICAL ASPECTS OF HEALTH CARE 2 units**

Exploration of Nigeria legal system and the legislative process. Legal proceedings and the justice system. The Nigerian Constitution. Rule of law and the theory of separation of powers. Medical Malpractice; Medical Negligence, Contractual liability, the law of tort, vicarious liability, Hospital liability for the Acts of employees. The ethics of death and dying, organ donation, technology and vegetative state, and other ethical problems in health care delivery. Selected case studies of contemporary ethical health/medical issues like technological sustenance of life for patients on comatose.

HEM 648: BIOSTATISTICS 2 units

Basics: what is statistics, populations and samples, defining the data, data analysis and presentation of results. Organizing and displaying data. Frequencies, frequency distributions and histograms. Univariate descriptive statistics: means, medians, mode, standard deviations and standard errors. Normal distribution. Significance tests for a single mean. Comparison of two means and several means. Key principles of statistical inference. Parametric and non-parametric tests. Differences among group means. Correlation, Simple and multiple regression. Factor analysis. Measures of mortality and morbidity. Use of computers. Diagnostic tests. Statistical software packages.

HEM 651: ADVANCED EPIDEMIOLOGY 2 units

Definition and description of common epidemiological terms and principles. Measuring diseases and illnesses. Principles of various epidemiological study designs and their applications. The distribution and distribution of common communicable and non-communicable causes of diseases and illnesses in Nigeria. This will involve the application of epidemiological principles to the control of communicable and non-communicable diseases as well as health related events. Basic concepts in the principles of transmission and control of communicable and non-communicable disease. Disease Burden and the social determinants of Health Epidemiologic transition.

Meaning and Nature of demography: Sources and types of demographical data, population structure and dynamics; presentation of demographic data and rates. Basic measures of fertility: rates of natural increase, population growth and estimates, migration and mortality rates. Application of designing and analysis of epidemiological studies. The application of epidemiological principles to the control of communicable and non-communicable diseases as well as health related event. Basic concept in the principles of transmission and control of communicable disease. Surveillance of communicable disease. Community diagnosis.

**HEM 674: PROJECT WORK 6 units**

Every Student is expected to undertake a research and produce a dissertation, which must meet an acceptable standard on a topic chosen from the field of Health Economics, Management or Policy. Each student shall be assigned a Supervisor from the academic staff of the Department or any other academic staff of the University. The project work shall be based on an empirical study of a real life problem or situation as agreed by the Department. This project report also shall be examined by an external examiner.

Doctor of Philosophy (Ph.D.) Programme

**PHILOSOPHY**

The manpower need for health economists as well as health systems and policy analysts are on the increase especially with the recent health reform programmes in Nigeria and the rest of sub-Saharan African (SSA) sub-region. More so, international and civil society organizations are in constant demand for health economists and health system analysts to develop policies and implement various health reform programmes in the country as well as evaluate and provide economic evidence for improving diverse health programmes.

The need for health economists, managers and policy analysts run through the desire to build capacity to accomplish the demand for appropriate allocation of scarce resources, health management effectiveness and relevant decision making and performance applications to the health industry to maximize the health and well being of the citizenry.

Evidences show that the greatest problem preventing appropriate delivery of care, improved access to care and the financial viability of the health system has been the scarcity of trained and seasoned health care managers. As a result, it has become necessary and important to provide relevant professional training in health economics, health management and health policy in order to develop health management experts and health economists with high academic and professional skills to provide effective leadership in the health system.

However, there is lack of developed capacity in health management, economics and policy in Nigeria and in most SSA countries, which can be bridged by starting an appropriate advanced training in the areas so to produce academics, analysts and policy makers that are knowledgeable in the subject areas. The capacity so developed are required to improve the health system and ensure that the country attains and maintains the Millennium Development Goals (MDGs), institutionalize an efficient and equitable health sector reform programmes and ultimately improve the health status of the people and move towards Universal Health Coverage [UHC].

There is thus an urgent need to start the PhD programme in health economics, management and policy to help curb the weaknesses in the management of the health system engendered by lack of capacity in the areas as well as the absence of the appropriately trained health managers, which is pre-requisite for improving the healthcare system. The PhD programme will also produce a critical mass of academics and experts required to teach the courses to other people within the University system and to undertake research activities that will provide the evidence-base for improving the performance of the health system.

**OBJECTIVES OF THE PROGRAMME:**

Aim: The PhD programme in Health Economics, Management and Policy is designed to provide advanced training in health economics, health management or health policy for increasing research and technical expertise including analytic problem solving capacity to the graduates particularly: providing specialized training and techniques needed for effective conduct of research in the subject areas; broadening the intellectual base and global understanding of health system issues; and enable proper scholarly productivity and contribution to knowledge in the specified areas.

**SPECIFIC OBJECTIVES**:

1. To provide advanced training in health economics, health policy and health management techniques to academics and various health system managers and policy makers.

2. To provide specialized training and techniques required for effective planning and analysis of contemporary health sector issues.

3. To provide students with frameworks which will enable them to understand and analyse health systems and policies.

4. To develop experts capable of engaging in health systems and research and analysis and ultimately improving the performance of health systems.

5. To develop a critical mass of academics that will propagate capacity building and research in health economics, management and policies.

**DESCRIPTION OF THE PROGRAMME**

**SCOPE**

The programme will cover the advanced aspects of the disciplines of health economics, health policy, health management and health administration. The programme will also cover basic epidemiology including the control of common communicable and non-communicable diseases, advanced principles of organization of health systems including hospitals and health sector reform issues. A minimum workload of 24 credit units of which 12 credit units are for the thesis, 6 credit units for the Masters programme or coursework and 6 credit units for seminars.

**ADMISSION REQUIREMENTS**

To be admitted into the PhD programmes in Health Economics, Health Management/Administration or Health Policy a candidate should: Hold M.Sc. degree (which includes coursework and research) in Health Economics, Health Management/Administration, or Health Policy or in a related area from University of Nigeria or any other recognized university provided the university matriculation is satisfied. In addition a relevant working experience on Health Management and Policy matters will be an advantage.

**MODE OF STUDY**

It will be coursework and research-based with individual students working with assigned supervisors. It shall have coursework with written examinations and a research thesis that involves oral defence and requires the participation of an external examiner.

**DURATION**

Full-time: A minimum of four (4) semesters and a maximum of ten (10) semesters. Part-time: A minimum of six (6) semesters and a maximum of fourteen (14) semesters.

**AREAS OF SPECIALISATION**

Health Economics

Health Planning and Management

Health Policy

**EMPLOYMENT OPPORTUNITIES**

There are excellent employment opportunities in various arms of research, health and educational sectors. The graduates could be employed as: Outcomes analysts in pharmaceutical industry; Health economists in Ministries of Health and Development agencies; Health service Administrators and Managers in hospitals and other health care organizations; Lecturers and Researchers in the Universities; Research fellows in Research institutes; Programme Managers by bilateral and multilateral organizations such as the World Health Organization; etc.

SCORING AND GRADING:

Scoring and grading of courses shall follow the guideline in which the percentage scores and interpreted in letter grade [A – C &F] and grade points [0, 3 – 5] as displayed in the table below

|  |  |  |
| --- | --- | --- |
| **Percentage Score** | **Letter Grade** | **Grade Points** |
| **70 - 100** | **A** | **5** |
| **60 - 69** | **B** | **4** |
| **50 - 59** | **C** | **3** |
| **0 - 49** | **F** | **0** |

The minimum pass mark for any course work is 50%;

30% shall constitute Continuous Assessment and 70% shall be from Examination score.

Candidates are required to re-register any failed course.

AWARD OF DRGREE

The degree of PhD in Health Administration and Management is awarded to only candidates who have passed all prescribed Courses, Seminars and other conditions prescribed by the Postgraduate School. There is no GPA passing grade for the award of Doctoral Degree. The Doctoral Thesis is on Pass or Fail basis. However, any Thesis score of less than 60% is deemed to have failed.

PROGRAMME STRUCTURE

**HEM 790: DOCTORAL THESIS 12 units**

**CORE COURSES**

**HEM 791: Doctoral Seminar I 2units**

**HEM 792; Doctoral Seminar II 2units**

**HEM 793; Doctoral Seminar III 2units**

COURSE WORK (See MSc HEMP programme for details):

PGC 701 Synopsis and Grant writing 3units

HEM 601 Advanced Health Planning and Management 3units

HEM 613 Advanced Health Economics 3units

HEM 625 Health systems and Policies 3units

Total 30 units

COURSE DESCRIPTION

PGC 701 SYNOPSIS AND GRANT WRITING 3 units

Identification of types and nature of grants and grant writing: mining of grants application calls on the internet. Determining appropriate strategy for each grant application. Study of various grant application structures and contents and writing of concept notes, details project description, budgeting and budget defense. Study of sample grant writings in various forms and writing of mock research and other grants. Identification of University of Nigeria synopsis structure and requirements (Introduction, Methodology and Results). Determining the content of each sub-unit of the synopsis. Steps in writing the synopsis from the Dissertation/Thesis document. Structural and Language issues. Common errors in synopsis writing and strategies for avoiding them. The roles of the students and supervisors in the production of a synopsis. Writing of mock synopsis. All registered Ph.D students must attend a solution-based interactive workshop to be organized by the School of Postgraduate Studies for a practical demonstration and application of the knowledge acquired from the course, conducted by selected experts.

HEM 790: DOCTORAL THESIS

This is a report based on a comprehensive research in area of Health Economics, Health Policy or Health Management.

**HEM** **791:** **DOCTORAL SEMINAR I: 2units**

This is a detailed written concept paper presentation of the candidate’s PhD topic proposal which includes introduction, the research problems, aims and objectives, preliminary literature review, conceptual framework and research methods. It will also include a presentation on issues, theories and current academic debate and status in the candidates proposed area of study

**HEM 792:** **DOCTORAL SEMINAR II: 2units**

A presentation by the student of the complete research proposal, including the data collection tools and proposed data analytic methods.

**HEM** **793:**  **DOCTORAL SEMINAR II1:**

**A detailed written post field of the candidate’s PhD work**

**N/B ALL PhD CANIDATES ARE TO PUBLISH AT LEAST ONE PAPER FROM THEIR THESIS IN AN IMPACT FACTOR JOURNAL [THOMSON REUTERS] BEFORE FINAL DEFENCE**

DEPARTMENTAL REGULATIONS

**Students are required to have attended at least 75% of lectures for each module to be eligible to sit the examination and continuous assessment for that module.**

1. **Students are required to have undertaken a continuous assessment test for each module (which carries 30% of the final marks) before sitting the examination.**
2. **Any course not passed at the first attempt will be carried over to the following session.**
3. **It is expected that the taught courses and examinations will take place in the first 9 months of the calendar year (PGD and MSc.) and the last 3- 9 months will be dedicated to the project work at the end of which students are expected to submit their projects.**
4. **Students are expected to possess a laptop, a functioning internet access and a scientific calculator as basic minimum at the commencement of the course.**

**DEPARTMENT OF MEDICAL LABORATORY SCIENCES**

**LIST OF APPROVED SUPERVISORS**

**Prof. N.F. Onyemelukwe, B.Sc (Nig), M.Sc, Mibiol, FIBMLS(Lond)**

**Ph.D**

**(Barr) P.U. Achukwu, BMLS, M.Sc., Ph.D**

**T.K.C. Udeani, AIMS, FIMLS, M.Sc., Ph.D**

**S.A. Ufelle, AIMLS, PGD, M.Sc., Ph.D**

**POSTGRADUATE PROGRAMME**

The Department of Medical Laboratory Sciences is a multi-disciplinary department which offers postgraduate courses leading to post-graduate diploma (PGD), Master of sciences (M.Sc) and Doctor of Philosophy (Ph.D) degrees in Medical Laboratory Science disciplines.

**PHILOSOPHY**

The programme is aimed at exposing the students to an advanced knowledge of the theory and practice of Medical Laboratory Sciences. Students would further be exposed to the application of Medical Laboratory Sciences in key areas such as Medicine, food and beverages, pharmaceutical industries, as well as utility departments like the water corporation etc.

The courses offered are designed to expose the students to core areas like Clinical Chemistry, Haematology, Histopathology, Medical Microbiology, Immunology and Immunochemistry, as well as Instrumentation and Techniques.

**OBJECTIVES**

The objectives of the Postgraduate programme are:-

1. To produce competent Medical Laboratory Scientists who can take full charge of medical laboratories in Teaching and Specialist Hospitals or in community health centers
2. To produce Medical Laboratory Science teachers for under-graduate and postgraduate courses for relevant facilities in Universities and other Higher Institutions and Research Centers through out the country and world-wide.
3. To develop graduate research expertise in laboratory and Clinical Medical Laboratory Science disciplines.
4. To produce scientists who are able to modify existing techniques, understand the working of laboratory instruments and reagents, modify them and fabricate new ones.

**The scope of the programme will involve of the following areas:-**

Clinical Chemistry

Haematology

Histopathology

Microbiology

Immunology

**ENTRY REQUIREMENTS**

The candidate must satisfy the entry requirements stipulated by the senate of the University.

**PGD**: Candidates for the PGD are required to have obtained a degree in Medical Laboratory Sciences (third class), or an acceptable Medical Laboratory Science Professional diploma or Upper credit or any other acceptable qualifications.

**M.Sc:** Candidates must obtain at least a B.MLS second class (Honours) degree in Medical Laboratory Sciences of the Department of Medical Laboratory Sciences of the University of Nigeria, Nsukka or its equivalent from a recognized University with a CGPA of 2.50 on a 5 point scale or its equivalent. Also Postgraduate Diploma of the Department Medical Laboratory Sciences, University of Nigeria, Nsukka with at least 3.50 GPA on a 5-point scale is acceptable for the M.sc programme.

**Ph.D:** The basic entry requirement is M.Sc degree of the Department of Medical Laboratory Sciences or in related areas obtained from the University of Nigeria, Nsukka or from other recognized Universities recognized by senate provided that the M.Sc is passed with grade point average of at least 4.00 on the 5 point scale or its equivalent and a thesis score not lower than 60% (B). Candidates must also have obtained Bachelrs degree from an approved University with a minimum of second class lower division with a CGPA of **3.0/5.0.**

**Note:** Candidates must satisfy the ‘O’ level entry requirements which is minimum of credit in English Language, Mathematics, Physics, Chemistry and Biology in not more than two (2) sittings.

**MODE OF STUDY**

**PGD:** The postgraduate diploma is designed for graduates whose degrees do not meet the entry requirements for Masters degree work in the first instance or candidates who may need to do the in-depth work. Candidates for Postgraduate Diploma will be expected to complete a minimum load of 24 units before graduation. The programme consists mainly of course work and research project. The postgraduate diploma is done full time or Part-time. Successful completion of the postgraduate diploma may not necessarily qualify a student to progress to M.Sc programme. Postgraduate students will be required to take all the core courses and the ancillary remedial courses.

**M.Sc:** A study for the degree of Masters would be pursued the following way: By course work to be examined in written papers together with research work to be presented in a **thesis,** where course work predominates over research and constitutes not less than two-thirds of the total credit hours. Candidates for the master’s degree will be required to take a minimum credit load of 30 units before graduation and will be required to do all the core courses and 6 other courses in chosen area of specialization. Each candidate shall deliver a seminar of his project (proposal seminar) and a final seminar at the end of his project.

**Ph.D:** The Ph.D degree programme will be by comprehensive research to be embodied in a thesis in the candidate’s chosen area.

**DURATION**

The maximum and minimum duration of the programme shall be:

**(a) Duration for the PGD programme:**

**Regular students**: Full Time: 2 Semesters minimum (same programme may require a little more than the stipulated period. A maximum of 4 semesters.

**(b) Duration for the Masters programme**

**Full Time**: A minimum of 4 semesters

A maximum of 8 semesters

**Part-time:** A minimum of 6 semesters

A maximum of 10 semesters

**(c) Duration for Ph.D programme**

**Full Time:** A minimum of 6 semesters

A maximum of 10 semesters

**Part Time:** A minimum of 8 semesters

A maximum of 14 semesters

**EMPLOYMENT OPPORTUNITIES**

Successful graduates in Medical Laboratory Sciences are equipped for careers in research institutions, tertiary institutions, Ministry of Health, teaching hospitals, private hospitals, water corporation, breweries, Pharmaceutical industries, food industries, equipment fabrication industries or be self employed. Firms, organizations and Governments may take advantage of the postgraduate programme to give short-term training to their employees in the relevant fields.

**AREAS OF SPECIALIZATION (STRESS AREAS)**

General Theory methodology and research seminars - 0

Clinical Chemistry - 1

Haematology - 2

Histopathology - 3

Microbiology - 4

Immunology - 5

Project Report/Thesis - 9

**POSTGRADUATE DIPLOMA**

**Compulsory common Courses:**

All candidates must register all the compulsory common courses

COURSE NO TITLE UNITS

1st Semester 2nd Semester

MLS 0601 The biology of Disease 3

MLS 0602 Biomedical Engineering,

Instrumentation and techniques 4

MLS 0603 Laboratory practice,

Measurement and

Research methodology 3

MLS 0604 Postgrduate diploma seminar 3

MLS 0691 Postgraduate diploma project 4

10 7

Required Ancillary Remedial Courses

All candidates must pass this following Ancillary Remedial Courses:

MLS 0663 Bioenergetics, metabolic pathways and

Inborn errors. 3

MLS 0635 Biostatistics in Health technology 3

MLS 0661 Introduction to computer science 3

3 6

PGD Specialization:

Candidates are advised to register the 6 units courses relevant to the various specializations as listed below:

1. CLINICAL CHEMISTRY

MLS 0611 General Clinical Chemistry 3

MLS 0612 Separation and Analytical Methods 3

MLS 0613 Clinical Biochemistry 3

6 3

1. HAEMATOLOGY

MLS 0621 General Haematology 3

MLS 0622 Medical Haematology 3

MLS 0623 Transfusion Science 3

6 3

1. HISTOPATHOLOGY

MLS 0631 General Histopathology 3

MLS 0632 Cellular Pathology 3

MLS 0633 Methods in Histopathology 3

6 3

1. MICROBIOLOGY

MLS 0641 General Microbiology 3

MLS 0642 Medical Microbiology 3

MLS 0643 Applied Microbiology 3

MLS 0644 Public Health Parasitology/Entomology 3

6 6

1. IMMUNOLOGY AND IMMUNOCHEMISTRY

MLS 0651 General Immunology 3

MLS 0652 Methods in Immunology 3

MLS 0653 Immuno Cells and functions 3

6 3

**COURSE DESCRIPTIONS**

**MLS 0601 THE BIOLOGY OF DISEASE:** This involves a detailed study using a case-oriented and inter-disciplinary approach of the laboratory investigation of disease. The cell as a basic of life and disease, cellular response to insult the nature of the immune response, general and systematic pathology aspect, pathogenticity, inflammation, complement, Haemostasis, Anaemia, lencocyte, disorders, malignancy, congenital disorders. Aspects of pharmacology, the scientific investigation of disease.

**MLS 0602** Biomedical Engineering Instrumentation and Techniques, Principles of applied and general electronics and the mechanics of electrical circuits, fault finding, care and maintenance of electrical equipment in laboratory use. Workshop practice, improvement on existing equipment, manifestation and review of laboratory tests, etc. 4 units

**MLS 0603** **LABORATORY PRACTICE, MANAGEMENT AND RESEARCH METHODOLOGY** Laboratory management, professional ethics, principles of quality control, principles of learning resources, laboratory records and statistical analysis, research methodology problem definition, sampling techniques, literature review, questionnaire design and data collection analysis, interpretation and utilization of research finding, role of research in health and social welfare, art of scholarly publication etc. 3 units

**MLS 0604 PGD SEMINAR**

Under the supervision of a staff, the student is expected to take seminar topics on chosen fields for detailed study using library methods, emphasizing on recent advances. The course is expected to give the student the opportunity for independent thought and expression. The work is finally presented to staff and students and also written up 3 units

**MLS 0691 PGD PROJECT**

Each student is expected to carry out a fairly detailed research investigation under the supervision of a staff in his chosen field. Write it up as a project report and be examined for his knowledge of the work before a panel of external and internal examiners in an oral examination. 4 units

**MLS 0611 GENERAL CLINICAL CHEMISTRY**

The purpose and scope of clinical chemistry investigation. Body fluids and electrocyte balance, acid-base balance, carbohydrate metabolism, protein metabolism, lipid metabolism, blood lipids, urinalysis . 3 units

**MLS 0612 SEPARATION AND ANALYTICAL METHODS**

Chromatography, HPLC, affinity etc, Chemi-luminescence assays, electrophoresis, immunodiffusion, fluorimetry, immunoassays, automation, end point analyzers, radioisotopes, computer aspects etc. Analytical principles. **3 units**

**MLS 0613 CLINICAL BIOCHEMISTRY**

Liver, kidney, gastrointestinal tract, biochemical investigations, assessment, functions and malfunction. Calcium and skeletal metabolism, muscle, biochemistry of vascular disease, coma, haem and iron, biochemistry of cancer. Protein metabolism-structure, function, regulation, estimation, and clinical significance. Biochemical investigation of hypo and hyper gamma globulinaemias, clinical biochemical tests in nutritional homeostasis, endocrine and pathological disorders, toxicology and therapeutic drug monitoring 3 units

**MLS 0621 GENERAL HAEMATOLOGY**

Cell metabolism, physiology, genetics, reticuloenddial system and blood, Anatomy and microanatomy, advanced principles of haematological practice.

3 units

**MLS 0622 MEDICAL HAEMATOLOGY**

Cell counting, immunological aspects, kinetics, biological and radioassay systems, electrophoretic, chromate-graphic and spectrophetemetric analysis, cytochemistry and rheology anaemias, disorders of iron metabolism, vitamin B12 and folate deficiencies, haemochromatosis and related storage disorders, automation in haematology, lymphocyte transformation tests, paul Bunell tests etc. 3 units

**MLS 0623 TRANSFUSION SCIENCE**

Immunoglobulins, detection of antigens and antibodies, tissue and blood group system, reagents used in blood group serology and immunology. Investigation of blood transfusion reactions, haemolytic anaemias, antenatal serology, applied blood group serology, autoimmunization, quality control in serology etc. 3 units

**MLS 0631 GENERAL HISTOPATHOLOGY**

Cytogenetics, histochemistry, principles and techniques and chromosome analysis, autoradiography, basis of photographic and museum techniques, electron microscopy. Introductory general pathology. Diseases due to deficiencies and excesses, gross appearance of disease and organism, routine and post mortem examination slides. 3 units

**MLS 0632 CELLULAR PATHOLOGY**

Normal structure and ultrastructure of cells and tissues and general principles of methods for examining them. Physiological variation, immune responses, aspects of applied histology and cytology. 3 units

**MLS 0633 METHODS IN HISTOPATHOLOGY**

Chemistry of fixation, freeze drying, theories of staining, immunocytochemistry, histochemistry, theories of staining, molecular structure and classification of dyes, instrumentation used in cytophotometry, cell, tissue and organ culture. Quantitative microscopy, embedding procedures, preparatory techniques for associated cells and tissues, transmission electron microscopy, laboratory safety. 3 units

**MLS 0641 GENERAL MICROBIOLOGY**

Structure and physiology of micro-organisms, microbial interactions, taxonomy and nomenclature, workings of the international committee on systematics, destruction of micro-organisms, genetic transfers, products of microbial metabolism etc.

**MLS 0642 MEDICAL MICROBIOLOGY**

Nature, occurrence, distribution, made of infection, isolation and identification of bacteria, fungi, viruses of medical importance. Immunology of these organisms, methods in microbiology: infection and immunity. Bacteria in health and diseases. 3 units

**MLS 0643 APPLIED MICROBIOLOGY**

Role of micro-organisms in industrial processes. Foods, spoilage, vaccines, agriculture, soil, breweries, antibiotics, etc. Aspects of water microbiology and disease control. 3 units

OR

**MLS 0644 PUBLIC HEALTH PARASITOLOGY/ENTOMOLOGY**

Helminths and protozoa of medical importance, insects as vactors of disease. Methods of diagnosis, biology, nature, control. Immunity to parasites.

3 units

**MLS 0651 GENERAL IMMUNOLOGY**

Historical development and background, theories, inmate immunity, acquired immunity, cellular interaction in the expression and regulation of gene expression.

**MLS 0652 METHODS IN IMMUNOLOGY**

Detailed aspects of immune diagnosis and serology. Modern techniques and trends 3 units

**MLS 0653 IMMUNE CELLS AND FUNCTIONS**

Ontogeny of the immune system and immune responsive. Physiogenetic development of the immune system in vertebrates and invertebrates. Phagocytes and phagocytosis, structure and physiology of the lymphoid system, lymphocytes, origin development and functions. Immunoglobulins, chemistry and relationship to functions. Immunological response to infection, aspects of transplantation, hypersensitivity and autoimmunity. 3 units

**M.Sc DEGREE PROGRAMME**

**M.SC SPECIALIZATION**

Candidates must register at least 6 (18 credit units) of the following courses in their areas of specialty. In addition, all candidates must also register for seminar/special topics (2 units) and undertake projects (6 units) in their areas of specialty.

1. **Core Courses:**

Irrespective of specialization, all candidates shall register the following compulsory courses:

1st - 2nd

MLS 601 Advances in Molecular Biology 3 -

MLS 602 Research Methodology and ICT Application - 3

MLS 603 Entrepreneurship Studies 2 -

MLS 604 Master’s Research Seminars/Special Topics 2 -

MLS 605 Advanced Immunology and Immunochemistry - 2

MLS 691 Master’s Research Project - 6

**M.Sc Specializations**

Candidates shall register 6 courses that are relevant to their specialization area

1st - 2nd

1. **Clinical Chemistry**

MLS 611 Advanced General Clinical Chemistry 3 -

MLS 612 Clinical Endocrinology 3 -

MLS 613 Clinical Enzymology 3 -

MLS 614 Lipid Biochemistry - 3

MLS 615 Analytical Toxicology - 3

MLS 616 Clinical Biochemistry - 3

MLS 617 Inborn Errors of Metabolism 3 -

MLS 618 Nutrition and Metabolism Disorders 3 - 3

1. **Haematology**

MLS 621 Advanced General Haematology 3 -

MLS 622 Haemostasis  **-** 3

MLS 623 Disorders of the blood - 3

MLS 624 Laboratory investigation, diagnosis and

Therapeutics (compulsory) 3 -

MLS 625 Instrument, automation and Management 3 -

MLS 626 Advanced Blood banking - 3

MLS 627 Advanced blood group serology - 3

MLS 628 Immunohaematology 3 -

1. **Histopathology**

MLS 631 Advanced General Histopathology 3 -

MLS 632 Advanced general Pathology (compulsory) - 3

MLS 633 Applied Cytology3 **-**

MLS 634 Advanced Histochemistry (compulsory) - 3

MLS 635 Tissue Culture and Museum Techniques - 3

MLS 636 Advanced Anatomical Techniques 3 -

MLS 637 Advanced Applied Histology 3 -

1. **Microbiology**

MLS 641 Advanced General Microbiology 3 -

MLS 642 Advanced Water, Pollution and

Sewage Microbiology - 3

MLS 643 Advanced Systemic Virology - 3

MLS 644 Advanced Pathogenic Bacteriology 3 -

MLS 645 Advanced Antimicrobial Agents and

Chemotherapy 3 -

MLS 646 Advanced Medical Mycology 3 -

MLS 647 Bacterial Genetics and Genetic

Engineering 3 -

MLS 648 Advanced Microbiology and Biotechnology 3 -

MLS 649 Advanced Medical Parasitology - 3

MLS 660 Advanced Public-Health Microbiology - 3

MLS 661 Advanced Pharmaceutical Microbiology - 3

MLS 662 Advanced Medical Entomology - 3

1. **Immune and Immunochemistry**

MLS 651 Advanced General immunology 3 -

MLS 652 Historical Advances and Immune Cells - 3

MLS 653 Tumour Immunology 3 -

MLS 654 Transplantation Immunology - 3

MLS 655 Immunopathology 3 -

MLS 656 Immunochemistry - 3

MLS 657 Methods in Immunology 3 -

**COURSE DESCRIPTIONS FOR M.SC DEGREE PROGRAMME**

**MLS 601 Advanced Molecular Biology**

Introduction to Molecular biology and genetic engineering RNA, DNA structure, gene, reverse transcriptase, retro virology, protein synthesis. Other enzymes in molecular biology, DNA polymorphisms, DNA sequencing, Southern blot, Northern blot, Western blot, polymerase chain reaction technology and applications, gene cloning, recombinant DNA products, Advances in Analytical techniques. The human genome project, cloned genes and diagnosis. Vaccines, Hormones, Gene Therapy, Genomic Libraries. Social implications of biotechnology and ethical issues.

**MLS 602 Research Methodology**

**Definition of research:**

Introduction to research methodology, 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 Government ethical clearance for some research projects. Research proposal and sourcing of fundings of research projects. Art of scholarly publications, and instructional design, types of research investigations; general and specific purpose research; research process, e.g, identification and specification of aims and objectives; assumption, hypothesis formulation, theoretical modeling, sampling techniques, avoidance of bias; definition of variables, instruments for data collection, repeatability, validity, relevance. Calibration of equipments, electronics and integrated circuit; fault detection and troubleshooting; basic measuring instruments-principles of action; handling of laboratory animals. Data processing, editing and preparation of data analysis; interpretation of results and findings; report writing, ethics of research integrity.

**MLS 603 Entrepreneurship Studies**

Introduction and evolution of entrepreneurship**,** Challenges of entrepreneurship, Techniques for improving the creative process, Competitive advantage, Feasibility analysis, forms of business ownership and franchising, forms of business financing, Right location and layout for a small business, Importance of a business plan.

**MLS 604 Master’s Research Seminars/Special Topics 2 units**

Written presentation by individual students of seminar papers on selected topics in MLS 691 current trends and topical issues (about 3 seminars)

**MLS 611 Advanced General Clinical Chemistry 3 units**

General advanced courses in clinical chemistry, units, carbohydrate metabolism, biochemistry of Haem and iron, biochemistry of cancer, biochemistry of selected populations, physiological and biochemical mechanisms and their investigations. Advances in general biochemical instrumentations, separation and analytical methods and principles.

**MLS 612 Clinical Enzymology 3 units**

Structure and the molecular basis of enzyme function, characterization and purification of enzymes. Distribution and regulation of enzymes actions. Isoenzymes, coenzyme and proenzymes. Pathophysiologic mechanisms in the application of interpretation of enzyme assays. Theories of enzyme catalysis and specificities. Structure and mechanisms of enzymes actions. Application in Medicine.

**MLS 613 Clinical Endocrinology 3 units**

Mode of steroid and protein hormone action, regulations, measurement, dynamic function and biochemical investigations of hormones and disorders of anterior pituitary gland, thyroid, parathyroid, adrenal cortex, medullar and gonads, ectopic hormones, hormones in oncology, infertility and endocrine emergencies, MENS etc.

**MLS 614 Lipid Biochemistry 3 units**

Lipid, Lipoproteins and Apolipoproteins of human plasma, and their physiological functions, methods of analysis and standardization of methods. Disorders of lipid metabolism, pathogenesis of atherosclerosis, lab investigation of lipid disorders.

**MLS 615 Analytical Toxicology 3 units**

Principles and mode of action of common drugs and therapeutic agents. Understanding of drug induction, resistance, and addiction. Drug interactions, principles of qualitative and quantitative drug screening and monitoring, measurements of common drugs and poisons in biological fluids and tissues. Environmental and ecotoxicology, treatment and disposal of hazardous wastes, phytotoxicology, experimental, clinical, forensic, food and applied toxicology.

**MLS 616 Clinical Biochemistry 3 units**

The biochemical investigation of liver disease notably jaundice as differential diagnosis, biochemical assessment of renal plasma flow, tubular function, stone formation, renal diseases, nephrotic syndrome, proteinuria, function and regulation of calcium metabolism and role of parathyroid hormones.

**MLS 617 Inborn Errors of Metabolisms 3 units**

The human genome project, detailed consideration of causes and consequences of genetic mutations, types of mutations, protein as a gene product, aminoaciduria, inborn errors of the connective tissues, laboratory investigations of inborn errors of metabolisms, molecular diagnostics.

**MLS 618 Nutritional and Metabolic Disorders 3 units**

Vitamin and mineral deficiencies: Antioxidants, fat, carbohydrate and protein disorders. Assessment of obesity e.g. Body mass disorders (BMI). Diabetes and other pancreatic disorders. Protein calorie malnutrition, lab management of DM.

**MLS 691 Master’s Research Project 6 units**

Each student is expected to carry out a detailed research investigation under the supervision of a supervisor in his chosen field, write it up as project report and be examined before a panel of Chief External Examiner and Internal Examiners in an oral examination.

**MLS 621 Advanced General Haematology 3 units**

Cell metabolism, physiology and genetics. Growth requirements, stimulation, suppression, requirements for the control of DNA and protein synthesis, gene inheritance and expression. Enzymology, cell metabolism, energy metabolism, membrane function, genetic counseling, cytogenetics, chromosome damage reticuloendothelial system and blood haemopoiesis, structure and function of blood, erythropoisis, leucopoiesis, thrombopoiesis, haematology of the newborn, and the aged antigens, antibodies and tumour immunology.

**MLS 622 Haemostasis 3 units** Haemostasis, blood coagulation-cascade, platelet, bleeding, biochemical basis of vascular diseases etc.

**MLS 623 Disorders of the Blood 3 units**

Aetiology and occurrences. Pathogenesis of inherited and acquired disorders from anaemia, leukaemias, fibrinolytic disorders. Diagnostic techniques in haemato-oncology. Pathophysiology, cellular and molecular mechanisms of Lukaemias, lymphomas and myelomas. Role of haematology Laboraotory in diagnosis and treatment of patients with these conclusions.

**MLS 625 Laboratory Investigations, Diagnosis and Therapeutics 3 units**

Haematological studies and practice, diagnosis, immunological, serological and radioisotopes. Haemostatic function studies, blood fractions, monitoring of chemotherapy and immune-suppresive therapy.

**MLS 626 Instrumentation, Automation and Management 3 units**

Design, performance, application and evaluation of equipment for continuous flow, discrete and selective fast analyses, electrometry, absorptiometry, fluoromentry, flow cytometry, and enzyme immunoassays. Statistical analysis of laboratory data. Management and control.

**MLS 627 Advanced Blood Banking**  **3 units**

Care, selection and organization of blood banking, donors, inventories, issues, check control, storage quality control, transfusion studies, hazard and diseases, cell separating machines etc.

**MLS 628 Advanced Blood Group Serology 3 units**

Detailed knowledge of cryocyte, granulocyte. Lymphocyte etc. preparation, standization, quality control of human and non-human blood grouping reagent, Rhesus D haemolytic diseases, autoimmune processes paternity testing and basic forensic serology, Geographic applications and compatibility studies.

**MLS 629 Immuno Haematology 3 units**

Immunobiology of the major histocompactibility complex, cell mediate and hormonal

Immunity. Immunosppression, immune deficiency principles of hybridoma production.

**MLS 631 Advanced General Histopathology 3 units**

Advanced general knowledge of histological methods and science, fixation and uses, advances preparatory techniques for dissociated cells and tissues. Embedding procedures, microtomy and ultra microtomy. Cryotomy, dyes and techniques, crysoschromes, and metallic salts, vital staining, histochemical methods to demonstrate cells, tissues and constituents.

**MLS 632 Advanced General Pathology 3 units**

The scientific aspects of important diseases of individual systems, and the scientific basis of therapy, pathogenicity, normal flora, natural defence mechanisms, inflammation, pathophysiology of acute and chronic inflammation, consequences of the inflammatory response, (organization, repair, fibrosis, wound healing), the beneficial and damaging immunologic consequences of the inflammatory response; complement, principles behind the sampling and examination of cells and tissues removed for diagnostic and forensic purpose in life and post mortem.

**MLS 633 Advanced Applied Histology 3 units**

Methods of obtaining and handing trophies, large surgical specimen and post mortem tissues, special fixatives and their applications, Decalcification and preparation of undecalcified sections. Special methods for the central and peripheral nervous system. Application of stains and histochemical methods to diagnostic problem and the significance of the results obtained.

**MLS 634 Applied Cytology 3 units**

Methods of obtaining specimens: Special preparatory techniques, application of special stains, techniques, application of special stains, techniques and cytochemical methods to diagnostic problems. Chromosome analysis. Premalignant, malignant changes in cytological reparations of epithelial surfaces, body fluid secretions and prarenchyma tissues; cytopathic effect of viruses, bacteria, fungi, parasites etc, Cytological monitoring of Therapy, colomoscopy etc. chromosome and DNA studies, paternity testing.

**MLS 635 Advanced Histochemistry 3 units**

Chemistry of fixation, freeze drying, crypopreservation, artifacts, theories of staining, molecular structure and deossification of dyes. Histochemistry of carbohydrates, lipids, proteins, amyloid, acids, enzymes, pigments etc. immunocytochemistry, theory and design of instruments in cytophotometry.

**MLS 636 Advanced Anatomical Techniques 3 units**

Advanced general knowledge of histological methods and science, fixation and uses, advances preparatory techniques for dissociated cells and tissues. Embedding procedures, microtomy and ultra microtomy. Cytotomy, dyes and techniques, crysoschromes, and metallic salts, vital staining, histotochemical methods to demonstrate cells, tissues and constituents. Advances in museum methods transparencies, paper mounted section, photography and micro incineration, osteological preparations, embalming and plastination.

**MLS 637 Advanced General Pathology 3 units**

The scientific aspects of important diseases of individual systems, and the scientific basis of therapy, pathogenicity, normal flora, natural defence mechanisms, inflammation, pathophysiology of acute and chronic inflammation, consequences of the inflammatory response, (organization, repair, fibrosis, wound healing), the beneficial and damaging immunologic consequences of the inflammatory response; complement, principles behind the sampling and examination of cells and tissues removed for diagnostic and forensic purposes in life and post mortem.

**MLS 638 Advanced Applied Histology 3 units**

Methods of obtaining and handling trophies, large surgical specimen and post mortem tissues, special fixatives and their applications, Decalcification and preparation of undecalcified sections. Special methods for the central and peripheral nervous system. Application of stains and histochemical methods to diagnostic problems and the significance of the result obtained.

**MLS 641 Advanced General Microbiology 3 units**

Advances in microbial physiology and metabolism, structure and composition, biosynthetic path ways and their regulation, mechanism of energy production, mechanism of sporulation, transport mechanisms, endosporulation, interactions of micro-organisms with their hosts, microbial pathogenic mechanisms, bacteria in health and disease.

**MLS 642 Advanced Water Pollution and Sewage Microbiology 3 units**

Advanced studies of microbial communities of natural water, (aquatic ecosystems), methods of determining the numbers and types of bacteria in water. Water borne pathogens, treatment, storage and control of water borne disease. water pollution, treatment of sewage and current trends in industrial wastes handling.

**MLS 643 Advanced Systemic Virology 3 units**

Advanced and current trends in diagnostic procedures, pathogenesis, immunology, chemotherapy. Molecular prophylaxis, aspects of virology and epidemiology of viruses of medical importance, current trends in classification, evolution, nature and mutaton of viruses. Vaccine production, emergence of new viral strains.

**MLS 644 Advanced Pathogenic Bacteriology 3 units**

Host-parasite relationships, details of the nature, occurrence, distribution, bacteria of medical importance, Virulent factors of pathogenic bacteria, epidemiology etc.

**MLS 646 Advanced Medical Mycology 3 units**

Advanced knowledge of the general characteristics of fungi, current trends in classification of fungi, clinical features, and processes in subcutaneous, superficial, cutaneous, deep seated mycoses.

**MLS 647 Bacterial Genetics and Genetic Engineering 3 units**

Introduction, molecular basis of genetics, biochemical genetics, crossing over, chromosome studies/ mapping, mutation and mutagenesis, DNA structure and repair, gene and reverse transcriptase. Gene conversion and recombination, regulation of gene expression, mutation, plasmids and phages. Gene cloning, host-vector system, isolation of vector and foreign DNA, formation of recombinant DNA, applications and principles.

**MLS 648 Applied Microbiology and Biotechnology 3 units**

Application of micro-organisms is industrial processes, sources, isolation, screening, culture collection and maintenance, large scale cultivation of micro-organisms, design and operation of industrial fermenters, scale up fementations. Recovery and purifications of microbial products, control alcohol,industrial solvents, antibiotics, vitamins, organic and amino acids, enzymes, vaccines, steroid transformation insecticides, fertilizers, applications of genetic engineering.

**MLS 649 Advanced Medical Parasitology 3 units**

Detailed consideration of the nature, occurrence, distribution, mode of infection, isolation and identification of protozoa and trends in cultural techniques, immunology and preservation of parasites. Advanced helminthology etc.

**MLS 651 Advanced General Immunology 3 units**

A detailed treatment of the concepts of immunity and immunology, cells and tissues of the immune system structure, function and diversity and production of antibodies, advanced knowledge of cell mediate immunity. Activation of thymus deprival lymphocytes etc. craft rejection cytotoxicity etc. historical approach and immunological theories, immune functions.

**MLS 652 Immunochemistry 3 units**

Advanced methods in immunology, historical advances, Ontogeny and phylogeny, non-lymphoid and lymphoid immunity, adaptive immunity, lymphocytes, immunologlobulin, chemistry and relationship to function; allotypes, isotopes, autotypes, immunogenetics, regulation of the immune system, advanced Immunology, immunochemistry and infection etc.

**MLS 653 Tumour Immunology 3 units**

Clinical aspects of ecology and the characteristics of malignant cells. Tumour associated antigens and the hostesponse. Animal models, value of tumour markers in diagnosis and disease management, immunoassays, immunocytochemistry, and immunoscintigraphy immunotherapy.

**MLS 654 Transplantation Immunology 3 units**

Histocompatibility testing and its relevance to transplantation. The selection, storage and culture of donor issues. Clinical aspects of transplantation, clinical immune-suppression, current practice and future prospects, bone macros transplantation, Graft versus bost disease.

**MLS 655 Immunopathology 3 units**

Autoimmunity, genetic and constitutional factors, role of hypersensitivity reactions including immune complexex in the pathology of autoimmune disease. organ specific and non-organs specific, immunodiagnostic test, processing of biopsies, therapy, classification of hypersensitive reactions, clinical manifestation prophylaxis, immune deficiencies.

**MLS 656 Historical Advances and Immune Cells 3 units**

Historical aspects of immunology including conceptional changes as an introduction to current understanding of immune function, non-adaptive host defence, mechanisms, chemistry, synthesis, genetical and activation of compliment, interaction with other biological systems, immunoglobulin, regulation etc.

**MLS 657 Methods in Immunology 3 units**

A detailed consideration of the relevant immunology techniques including details of immunoelectrophoresis, immune-florescence, immunodiagnosis, serological techniques, etc.

**MLS 660 Advanced Public Health Microbiology 3 units**

Introduction to epidemiology, epidemiology, epidemiology of infectious diseases. Infection and disease, signs, symptoms and epidemiology. Descriptive, analytical, statistical applications, experimental methods, sources and reservoirs of infections. Zoonoses, Nosocomial infection, prevention and control of infections diseases. Immunization, public health services, genetic epidemiology. The ecological approach to health and disease. applications as control measures, health policy and administration, international health.

**MLS 661 Advanced Pharmaceutical Microbiology 3 units**

The chemical basis, classification, modes of action and pharmaco kinetics of chemotherapeutic agents and antibiotics. Monitoring drug level in body fluid. Action upon microbial target sites. Mechanisms of resistance, inactivity enzymes, antibiosis, synergism, antagonism, laboratory testing etc.

**MLS 662 Advanced Medical Entomology 3 units**

Biology and Life cycle e.g. Arthropods, insect, family, acarines, mollusks, lices and flees. Disease transmission mechanism and dynamics. Vector-control technique insecticide and molluscides principle. Techniques in entomology, museum techniques.

**Requirements for Graduation**

To be awarded Masters degree candidates must pass a minimum of 34 credit units as follows:

1. Core course of minimum of 18 credit units
2. Required courses of a minimum of 8 units
3. A student shall present at least 2 seminars in special topics in his area of specialization and shall also submit and defend a research proposal (2 units)
4. Each student is expected to carry out a detailed research investigation under a supervisor in his chosen field, write it up as a thesis and be examined before a panel of Chief external Examiner and Internal Examiners in an oral examination (6 credits).

**Ph.D DEGREE PROGRAMME**

1. **Course Content**
2. The Ph.D degree programme in Medical Laboratory Sciences shall be undertaken through prescribed courses of not more than 12 credit units for those candidates who may not have taken such courses at the Masters level or who may require some extra knowledge to carry out their Ph.D research.
3. Doctorate or Ph.D programme should primarily be by research work, presentation of seminars, including research proposal and a final seminar after completion of research. A Ph.D thesis of 12 credit units must be defended before a panel of examiners including an external examiner.
4. **Requirements for Graduation**

To be awarded the degree of Doctor of Philosophy in Medical Laboratory Sciences, a candidate must have fulfilled the conditions set by the University and successfully defended his/her thesis and other prescribed requirements.

CLINICAL CHEMISTRY

MLS 711 Clinical Chemistry I (4 credits) Laboratory diagnosis of kidney, cardiac, liver, and hemolytic diseases. Instruction includes physiology and pathophysiology in conjunction with laboratory testing for the above diseases. Molecular medicine. Laboratory statistics.

MLS 712 Clinical Chemistry II (4 credits) Laboratory investigations of disorders in acid-base balance, lipid and carbohydrate metabolism, and endocrine functions. Biochemical markers of myocardial infarction. Case studies.

CHM 713 Advanced Biochemistry I (4 credits). Chemistry of proteins, carbohydrates, and lipids; immunology and AIDS. Enzymes and energetics of metabolic reactions. Metabolism of nitrogen-containing compounds, vertebrate metabolism, neurotransmission, nucleotides, and nucleic acids, DNA processes, RNA synthesis and processing, protein synthesis, gene expression, and cancer.

MLS 714 Biotechnology Techniques (4 credits).Techniques of immunoassays and techniques of isolation, manipulation, and analysis of proteins/nucleic acids. Includes both lecture and laboratory work

**DEPARTMENT OF MEDICAL RADIOGRAPHY AND RADIOLOGICAL SCIENCES**

**PGD, M.Sc. AND PhD REVISED CURRICULUM**

**DEGREE PROGRAMMES**

**LIST OF APPROVED POST-GRADUATE SUPERVISORS**

|  |  |  |  |
| --- | --- | --- | --- |
| **S/N** | **NAME OF STAFF** | **QUALIFICATIONS** | **AREAS OF SPECIALIZATION** |
| 1. | DR (MRS) F. U. IDIGO | Ph.D, MSc, MSc, BSc Hons | Radiology Admin & Mgt, Medical Imaging, Med Radiography |
| 2. | PROF K. K. AGWU | PhD, M.Sc, B.Sc(Equiv) DCR (London) | Medical Physics, Medical Imaging, Medical Radiography |
| 3. | DR C. U. EZE | Ph.D, MSc, BSc Hons | Medical Imaging, Med Radiography |
| 4. | DR M. C. OKEJI | Ph.D, MSc, BSc Hons | Radiation and Environmental Protection, Medical Imaging, Med Radiography |
| 5. | DR K. OCHIE | Ph.D, MSc, BSc Hons | Medical Imaging, Med Radiography |
| 6. | DR S. O. I. OGBU | Ph.D, MSc, BSc Hons | Medical Imaging, Med Radiography |
| 7. | DR (MRS) A.C. ANAKWUE | Ph.D, MSc, BSc Hons | Medical Imaging, Med Radiography |

**POST- GRADUATE DEGREE PROGRAMMES IN MEDICAL RADIOGRAPHY**

The Department of Medical Radiological Sciences offers postgraduate programmes leading to postgraduate Diploma (PGD), Master of Science (M.Sc.) and Doctor of Philosophy (Ph.D) degree in Radiography.

**POSTGRADUATE DIPLOMA (PGD) IN MEDICAL RADIOGRAPHY**

**Philosophy, Objectives and Scope:**

Medical Radiography and Radiological Sciences involves the use of ionizing and other forms of radiant energies in the diagnosis, treatment and management of diseases and is in indispensable arm of modern medical science being the pivot of modern diagnostic medicine.

The postgraduate programme of this Department is based on identified need to provide graduates of Medical Radiography and other suitably qualified candidates opportunity to undertake advanced and specialized professional studies in medical radiography, radiological sciences and related areas. These areas are presently experiencing acute shortage of manpower both in the private and public sectors of the economy.

It is designed to widen the knowledge, skill and employment opportunities of the graduates in the key specialties of the profession including radiation and environmental protection.

**Programme Objectives and Scope:**

The programmeis aimed at providing students with up-to-date theoretical, practical and interdisciplinary skills required in the various specializations of the subject. The scope of the programme will include specialization in any of the following areas:-

* Medical imaging
* Radiation and Environmental Protection
* Radiological Education
* Radiotherapy and Oncology
* Radiology Administration and Management

**Employment Opportunities:**

The present acute shortage of qualified medical radiographers and radiological scientists in Nigeria and Africa makes the job prospects very bright for graduates of this Department. Successful graduates of these programmes are equipped for career in clinical medical imaging including medical ultrasound, computerized tomography and radiotheraphy in private and government owned health establishments all over the nation. Career opportunities also exist in research institutions for the fabrication of components in x-ray technology. Tertiary health and educational institutions are grossly understaffed in these specialties including the ever-expanding area of environmental protection agency to mention a few.

**Stress Areas:**

0 – General

1. Instrumentation/Physics
2. Imaging Processes
3. Radiation and Environmental Protection
4. Therapy Technology
5. Administration
6. Education
7. Seminar
8. Anatomy/Physiology/Pathology
9. Research Methodology /Project Report

**Entry Requirement:**

The following may qualify for admission into Post-graduate Diploma (PGD)

1. Holders of professional qualifications such as Diploma of the College of Radiographers of London D.C.R. (London), R.T. (ARRT) USA, CAMRT (Canada), D.I.R. (Nig) or their equivalents.
2. Candidates who have obtained third Class Honours degree in Medical Radiography from University of Nigeria or other recognized universities with GPA not less than 2.00 on a 5-point scale or its equivalent.

**Mode of Study:**

The PGD is designed for graduates whose qualifications do not meet the entry requirement for Master Degree work. It is structured to make the students undertake course works and practicals in addition to completing a project report. The course work is broken into two semesters with a maximum of 12 credits to be taken in each semester.

**Requirements for graduation:**

To be awarded the PGD in medical radiography, a candidate must pass all the course work and submit a report of project work. The pass mark is 50% consisting of continuous assessment (30%) and the final examination (70%). The passing grade for Postgraduate Diploma is “C”. The classes of PGD and their corresponding GPAs are as follows:

|  |  |
| --- | --- |
| CLASS | GPA |
| Distinction | 4.50 – 5.00 |
| Credit | 3.50 – 4.49 |
| Merit | 2.40 – 3.39 |
| Fail | 0.00 – 2.39 |

Only candidates with at least credit level pass in the PGD will be allowed to proceed to the M.Sc. course.

**Duration of the Programme:**

The minimum duration of the Postgraduate Diploma programme shall be as follows:

* Full-time: A minimum of 2 semesters

A maximum of 4 semesters

* Sandwich: A minimum of 2 long vacations

A maximum of 4 long vacations

**Course Requirements**

The PGD programme consists of coursework, seminars and project work. Each student shall register for a minimum of 29 credit units consisting of the following:

|  |  |
| --- | --- |
|  | **Units** |
| Core Courses | 14 |
| Required Courses | 11 |
| Project | 4 |
| Total: | **29Units** |

**The Courses shall be distributed as follows:**

**First Semester**

|  |  |  |
| --- | --- | --- |
| **Course Codes** | **Course Title** | **Units** |
| RGS 0691 | Research Methodology | 2 |
| RGS 0612 | Radiation Physics, Dosimetry and Protection | 2 |
| COS 101 | Introduction to Computer Sciences | 2 |
| BIC 203 | Chemistry of Biological Molecules and Biochemical Catalysis | 2 |
| PYS 202 | Renal and Gastro-Intestinal Physiology | 2 |
| RGS 0651 | Health Administration | 2 |
| COM 351 | Biostatistics in Health Technology | 2 |
| Total | | **14Units** |

**Second Semester**

|  |  |  |
| --- | --- | --- |
| **Course Codes** | **Course Title** | **Units** |
| RGS 0622 | Radiographic Image Processes | 2 |
| RGS 0682 | Radiographic Anatomy | 2 |
| RGS 0624 | Radiographic Pathology and Image Critique | 2 |
| RGS0612 | Advanced Radiographic Equipment and Instrumentation | 2 |
| PYS 204 | Cardiovascular and Respiratory Physiology | 3 |
| RGS 0692 | Project | 4 |
| Total | | **15Units** |

**COURSE DESCRIPTION**

RGS 0691 Research Methodology:

Exposure to practical application of statistical/Biostatisticaltools and methods. Mean, mode, median array, range, standard deviation, graphs and graphing and chart. Data collection method, Data presentation and analysis.The scientific method and types of scientific research projects.Research design and projects.Research design and sampling methods.Inferences.Validity and Reliability issue and their Importance. 2 Units

RGS 0612 Advanced Radiographic Equipment and Instrumentation:

Filament circuits, Tomographic Units and attachments. Tube rating, Autotimers and applications.Fluoroscopic Units. Interlock circuits. Image Intensifiers and Television Tubes.Quality Assurance in Radiology.2 Units

RGS 0622: Trends in Radiographic Imaging and Optics:

The radiographic image and its relation to signal transfer, Transfer characteristics based upon modulation transfer function. Quality of radiographic image-noise resolution and contrast. Receiver observe image receptor requirement for various specialized procedures. Variables modifying the selection of exposure factors.Quality assurance.Introduction to other imaging modalities.2 Units

RGS 0623 Radiographic Pathology and Image Critique

Definition of common pathological conditions.Basic presentation and manifestation of various pathological conditions and disease entities on radiographs covering the major organs and systems of the body. 2 Units

RGS 0638 Radiation Physics, Protection and Dosimetry:

Wave and Quantum method of Energy Transfer; Electromagnetic spectrum. Electron emission and solid state physics. Photo electric The atom ionization. Radioactivity and Radioactive decay. Half life.Geiger-Natural Law.Units of activity and measurement K Capture, Special relativity.Production and interaction of X and Gamma radiations.Attenuations and inverse square law.Effects of filtration.2 Units

RGS 0651 Health Administration:

Management principles and functions.Leadership Dynamics and supervision.Motivational theories.Organizational structure.Interpersonal and intersectorial Relationships.Performance evaluation.Industrial and Public relations.Collective bargaining.Inventory, vital statistics and records.Budgeting and financial control. Communication processes.2 Units

RGS 0692 Project Report:

Each student works ona selected and approved topic. With practical application of the theories and principles.Learnt in RGS 0691. 2 Units

**MASTER OF SCIENCE (MSc) IN MEDICAL RADIOGRAPHY**

**Philosophy, Objectives and Scope:**

Medical Radiography and Radiological Sciences involves the use of ionizing and other forms of radiant energies in the diagnosis, treatment and management of diseases and is an indispensable arm of modern medical science being the pivot of modern diagnostic medicine.

The postgraduate programme of this Department is based on identified need to provide graduates of Medical Radiography and other suitably qualified candidates, opportunity to undertake advanced and specialized professional studies in medical radiography, radiological sciences and related areas. These areas are presently experiencing acute shortage of manpower both in the private and public sectors of the economy.

It is designed to widen the knowledge, skill and employment opportunities of the graduates in the key specialties of the profession including radiation and environmental protection.

**Programme Objectives and Scope:**

The programme is aimed at providing students with up-to-date theoretical, practical and interdisciplinary skills required in the various specializations of the subject. The scope of the programme will include specialization in any of the following areas:-

* Medical imaging
* Radiation and Environmental Protection
* Radiological Education
* Radiotherapy and Oncology
* Radiology Administration and Management

**Employment Opportunities:**

The present acute shortage of qualified medical radiographers and radiological scientists in Nigeria and Africa makes the job prospects very bright for graduates of this Department. Successful graduates of these programmes are equipped for career in clinical medical imaging including medical ultrasound, computerized tomography and radiotheraphy in private and government owned health establishments all over the nation. Career opportunities also exist in research institutions for the fabrication of components in x-ray technology. Tertiary health and educational institutions are grossly understaffed in these specialties including the ever-expanding area of environmental protection agency to mention a few.

**Areas of Specialization:**

Students will have the option of specializing in any of the following areas:

1. Medical imaging
2. Radiation and Environmental Protection
3. Radiological Education
4. Radiology Administration and Management
5. Radiotherapy Technology and Oncology

**Stress Areas:**

1. General
2. Instrumentation
3. Imaging Modalities and Optics
4. Radiation and Environmental Protection
5. Therapy Technology
6. Administration
7. Education
8. Seminar
9. Anatomy/Physiology/Pathology
10. Dissertation

**Entry Requirement:**

The following may qualify for admission into Degree of Master:

1. Graduates of the University of Nigeria or of other recognized Universities who have obtained the approved degree of Bachelor of Medical Radiography with at least second class honors or its equivalent.
2. Candidates with university third class honors degree of the University of Nigeria in Medical Radiography or professional qualifications such as D.I.R. (London) T.T. DRRT (USA), CAMRT (Canada) D.I.R. (Nig.) plus the appropriate postgraduate diploma (PGD) of recognized universities with at least credit level pass.
3. For M.Sc. in Radiation and Environmental Protection and Medical Physics candidates with a good second class honors degree from the University of Nigeria or other recognized universities in Chemistry or Geology may be considered.
4. For M.Sc. in Radiology Administration and Management, candidates with a good second class honors degree from the University of Nigeria or recognized universities in the Health Sciences, Public Health and Management may be considered.

**Mode of Study:**

This shall be by course work and practical to be examined in written papers together with research work to be presented in a dissertation. The written work is moderated by an external examiner, and dissertation shall be defended in an oral examination before an external examiner.

The coursework is broken into two semesters with a minimum of 14 credits to be taken in each semester.

**Duration of the Programme:**

The minimum duration of the Masters of Science (M.Sc) Programmes shall be as follows:

* Full-time: A minimum of 4 semesters

A maximum of 8 semesters

* Part-time: A minimum of 6 semesters

A maximum of 10 semesters

**Areas of Specialization:**

1. Medical Imaging (with options in)

* Medical Ultrasound
* Computerized Tomography(CT)
* Magnetic Resonance Imaging (MRI)
* Nuclear medicine
* Conventional Radiography

1. Radiation Therapy and Oncology
2. Radiation and Environmental Protection
3. Radiography Education
4. Radiology Administration and Management

**Course Requirements**

Each student shall register for a minimum of 37 credit units consisting of:

|  |  |
| --- | --- |
|  | Units |
| Core courses | 13 |
| Dissertation | 6 |
| Specialized Courses | 18 |
| Total: | **37 Units** |

**Core Courses:**

Irrespective of specialization, all M.Sc degree candidates shall register and pass the following compulsory courses:

**M.Sc. Core compulsory Courses**

**First Semester**

|  |  |  |
| --- | --- | --- |
| Course Codes | Course Title | Units |
| PGC 601 | ICT and Research methodology | 3 |
| RGS 603 | Advanced Concepts in Medical Radiography Practice | 2 |
| RGS 673 | Professional posting and case reports | 3 |
| RGS 601 | Advanced Computer in Health Sciences | 2 |
| Total | | 10 Units |

**Second Semester**

|  |  |  |
| --- | --- | --- |
| Course Codes | Course Title | Units |
| RGS 602 | Advanced Statistics in Health Technology | 2 |
| RGS 672 | Research Seminar | 2 |
| RGS 692 | Dissertation | 6 |
| Total | | 10 Units |

**M.Sc. Specialization**

Candidates shall register for courses relevant to their areas of specializations.

**Medical Imaging**

**Common Courses**

**First Semester**

|  |  |  |
| --- | --- | --- |
| Course Codes | Course Title | Units |
| RGS 661 | Image Formation and processing | 2 |
| RGS 663 | Application of Digital systems in radiography | 2 |
| RGS 681 | Cross-sectional Anatomy in | 2 |
| Total | | 6 Units |

***Diagnostic Medical Ultrasound***

**First Semester**

|  |  |  |
| --- | --- | --- |
| Course Codes | Course Title | Units |
| RGS 613 | Physics of medical ultrasound | 2 |
| RGS 611 | Instrumentation and Quality Assurance in ultrasound | 2 |
| RGS 621 | Small Parts scanning | 2 |
| Total | | 6 Units |

**Second Semester**

|  |  |  |
| --- | --- | --- |
| Course Codes | Course Title | Units |
| RGS 682 | Human Embryology | 2 |
| RGS 622 | Obstetrics Sonography | 2 |
| RGS 624 | Abdominal and Pelvic sonography | 2 |
| RGS 626 | Echo - cardiography and Vascular sonography | 2 |
| Total | | 8 Units |

***Computerized Tomography***

**First Semester**

|  |  |  |
| --- | --- | --- |
| Course Codes | Course Title | Units |
| RGS 625 | CT of the musculo-skeletal system | 2 |
| RGS 623 | Patient Management and Contrast Media in CT | 2 |
| RGS 627 | CT of the Abdomen and Pelvis | 2 |
| Total | | 6 Units |

**Second Semester**

|  |  |  |
| --- | --- | --- |
| Course Codes | Course Title | Units |
| RGS 628 | CT of the Head and Central Nervous System | 2 |
| RGS 604 | Other applications of CT | 2 |
| RGS 614 | CT Physics and Instrumentation | 3 |
| Total | | 7 Units |

***Magnetic resonance Imaging (MRI)***

**First Semester**

|  |  |  |
| --- | --- | --- |
| Course Codes | Course Title | Units |
| RGS 605 | Basic Physical Principles of MRI | 2 |
| RGS 615 | Instrumentation and Quality assurance in MRI | 2 |
| RGS 629 | MR Imaging techniques for head and Central nervous System and Bones | 2 |
| Total | | 7 Units |

**Second Semester**

|  |  |  |
| --- | --- | --- |
| Course Codes | Course Title | Units |
| RGS 618 | Pulse sequences and Contrast Agents | 2 |
| RGS 616 | MR Imaging techniques for chest and abdomen | 2 |
| RGS 606 | MRI Artefacts and Safety Considerations | 2 |
| Total | | 6 Units |

***Nuclear Medicine***

**First Semester**

|  |  |  |
| --- | --- | --- |
| Course Codes | Course Title | Units |
| RGS 607 | Basic Physical Principles of Nuclear Medicine | 2 |
| RGS 617 | Instrumentation and Quality assurance in Nuclear Medicine | 2 |
| RGS 631 | Nuclear Medicine techniques for head and Central nervous System and Bones | 2 |
| Total | | 6 Units |

**Second Semester**

|  |  |  |
| --- | --- | --- |
| Course Codes | Course Title | Units |
| RGS 638 | Radiopharmaceuticals | 2 |
| RGS 632 | Nuclear Medicine techniques for chest and abdomen | 2 |
| RGS 608 | Safety Considerations in Nuclear Medicine | 2 |
| Total | | 6 Units |

***Medical Radiography***

**First Semester**

|  |  |  |
| --- | --- | --- |
| Course Codes | Course Title | Units |
| RGS 633 | Imaging and critique of the musculo-skeletal system | 2 |
| RGS 609 | Patient Management and Contrast Media in radiography | 2 |
| RGS 637 | Radiographic Imaging and critique of the Abdomen and Pelvis | 2 |
| Total | | 6 Units |

**Second Semester**

|  |  |  |
| --- | --- | --- |
| Course Codes | Course Title | Units |
| RGS 638 | Radiographic Imaging and critique of the Head and Central Nervous System | 2 |
| RGS 684 | Normal and Pathological Pattern recognition in Radiography | 2 |
| RGS 612 | General Physics and Instrumentation in Radiography | 2 |
| Total | | 6 Units |

**Radiation Therapy and Oncology**

**First Semester**

|  |  |  |
| --- | --- | --- |
| Course Codes | Course Title | Units |
| RGS 641 | Radiobiology | 2 |
| RGS 643 | Oncology | 2 |
| RGS 645 | Treatment Planning &Patient care in Radiotherapy | 2 |
| Total | | 6 Units |

**Second Semester**

|  |  |  |
| --- | --- | --- |
| Course Codes | Course Title | Units |
| RGS 642 | Radiotherapy Physics | 2 |
| RGS 612 | Radiotherapy Equipment | 2 |
| RGS 644 | Clinical Radiotherapy | 2 |
| Total | | 6 Units |

**Radiation and Environmental Protection**

**First Semester**

|  |  |  |
| --- | --- | --- |
| Course Codes | Course Title | Units |
| RGS 631 | Radiation Physics, Detection and Dosimetry | 2 |
| RGS 633 | Air Pollution from Fossil-Fuelled Industrial Processes And Aerosol Physics | 2 |
| RGS 635 | Nuclear Reactors, Nuclear fuel Processing and reactor waste | 2 |
| RGS 641 | Radiobiology | 2 |
| Total | | 8 Units |

**Second Semester**

|  |  |  |
| --- | --- | --- |
| Course Codes | Course Title | Units |
| RGS632 | Hazard Assessment from radioactivity and oil spillage Released into the environment | 2 |
| RGS 634 | Radiation protection and environmental monitoring | 2 |
| RGS 636 | Legislation and Economics of Environmental Protect | 2 |
| RGS 638 | Microwaves, Lasers and Environmental Noise | 2 |
| Total | | 8 Units |

**Radiography Education**

**First Semester**

|  |  |  |
| --- | --- | --- |
| Course Codes | Course Title | Units |
| RGS 651 | Educational Administration and Planning in Radiography | 2 |
| RGS 661 | Curriculum Planning in Medical Radiography | 2 |
| RGS 663 | Educational Psychology in Radiography | 2 |
| RGS 665 | Radiological Health Education | 2 |
| Total | | 8 Units |

**Second Semester**

|  |  |  |
| --- | --- | --- |
| Course Codes | Course Title | Units |
| RGS 664 | Instructional Teaching and Evaluation in Radiography | 2 |
| RGS 662 | Educational Innovations in Radiography | 2 |
| RGS 668 | Philosophy of Radiography Education | 2 |
| Total | | 6 Units |

**Radiology Administration and Management**

**First Semester**

|  |  |  |
| --- | --- | --- |
| Course Codes | Course Title | Units |
| RGS 653 | Health Economics and Budgeting | 2 |
| RGS 655 | Dynamics of Health Management | 2 |
| RGS 657 | Health Laws and Regulations | 2 |
| Total | | 6 Units |

**Second Semester**

|  |  |  |
| --- | --- | --- |
| Course Codes | Course Title | Units |
| RGS 652 | Health Planning Policy formulation and Implementation | 2 |
| RGS 654 | Health Personnel and Office Management | 2 |
| RGS 656 | Health Care Environment and Organization Behaviour | 2 |
| Total | | 6 Units |

**COURSE DESCRIPTION FOR MASTERS PROGRAMMES:**

**COMMOM CORE COURSES**

PGC 601 ICT and Research Methodology 2Units

In-depth research work aimed at acquiring full knowledge and presentations in scholarly writing of the concepts, issues, trends in the definition and development of statistics. Major steps in research: selection of problem, Literature review, Design, Data collection, analysis and interpretation, conclusions. Study of various research designs, Historical, Case studies, Surveys, Descriptive, Cross sectional, Experimental, etc. Analysis, surveys, and synthesis of conceptual and philosophical foundations of Statistics. Identification of Research problems and development of research objectives and hypotheses. Method of Project/Dissertation Writing. Application of appropriate advanced ICT tools relevant for data gathering, analysis and result presentation. Essentials of Spreadsheets. Internet Technology, Internet search Engines, Statistical Packages. Principles of scientific research. Aii registered Masters Degree students must attend a solution-based interactive workshop to be organized by The School of Post-Graduate Studies for a practical demonstration and application of the knowledge acquired from the course conducted by selected experts.

RGS 602 Advanced Statistics in Health Technology 2Units

Acquisition of techniques for the study and measurement of population. Sources and types of health data. Measure of central tendencies and variations. Biostatistical technique to health care delivery and Utilization. Analysis of health needs in specific high risk population.

RGS 601 Advanced Computer in Health Sciences: 2Units

Operating systems. Computer appreciation, soft and hardware mechanisms. Computer requirements for imaging systems. Data processing. Data methods and programming. Computer aided medical diagnosis.

RGS 603 Advanced Concepts in Medical Radiography and Radiological Sciences Practices:

Philosophy, Optimum health, illness-health-illness Continum .Holism. Quality assurance. Theory construction. Helping and caring processes. 2Units

RGS 673 Professional Posting in Specialty Area: 2Units

Laboratory and field based planning development and Validation of knowledge in cognitive, affective and psychomotor domains applied in the specialty areas.

RGS 671 Research Seminar: 2Units

Course designed to present and analytical frame. To enable students focus in a number of issues in the health field related to their specialty areas. Critical appraisal of Health theories. Application of theories of specific situation. Topics to be approved by supervisor. Presentation by students at departmental colloquium.

RGS 692 Dissertation: 6Units An in-depth analysis and thoroughly researched and original presentation of the results of the project report.

**MEDICAL IMAGING**

RGS 661 Image Formation and Processing: 2Units

The concept of object and image. Relationship between object and image. Detectors and detecting problem. The general image processing problem. Discrete representation and models for imaging systems. The general theory of image restoration. Image sampling. Interactive image processing. Clinical applications. The eye and the brain as a stage in and imaging system. Spatial and contrast relationship. Perception of moving images. Quantitative measures of investigative performance. Fourier transforms (Temporary and spatial modulation transfer, function, correlation techniques).ROC analysis.

RGS 663 Application of Digital Systems in Radiography: 2Units

Advantages of digital techniques.Image quality considerations. Digital imaging methods (film digitization, digital video fluoroscopy, scanning beam devices) large areas solid state detectors. Image manipulation in digital radiography: Operations on single and multiple images, multiple fluoroscopy: Digital angiographic imaging, subtraction techniques. System components. Digital scanned projection radiography (computed radiography). Clinical applications and quality assurance.Quantitative data analysis from digital fluorograms.

RGS 681: Cross-sectional Anatomy in Imaging. 2Units

Anatomic and Physiologic Relationshipships within the Abdominal cavity; Anatomic and physiologic relationships within the Thoracic cavity; Anatomic and physiologic relationships within the Pelvic cavity; Anatomic and Physiologic Relationships within the cranium.

**Diagnostic Medical Utrasound:**

RGS611: Instrumentation and QualityAssurance in Ultrasound 2Units

Ultrasound transducers, operating standards, equipment calibration, resolution, gray scale photography and image critique; functions of the components of processing, scan converter displays, image and display techniques, film and methods of permanent image recording; and emerging technologies.Types of scanners, types of models, Doppler units, duplex scanners.3-D ultrasound unit.Principles of ultrasound bone dosimetry.Equipment installation, equipment maintenance.Component spare parts fabrication.Advanced quality assurance in ultrasonography.

RGS 682 Human Embryology 2Units

Gene transcription, regulations of gene expression, induction and organ information, cell signaling; Primordial germ cells, the chromosome theory of inheritance, merosis, chromosomal abnormalities, structural chromosome abnormalities; Morphological changes during maturation of the gametes, spermatogenesis, ovarian cycle, ovulation, fertilization, cleavage, blastocyst formation, embryonic stem cells Abnormal implantation; Gastrulation: formation of embryonic mesoderm, ectoderm and endoderm;Neural crest cells, neural tube defects. Blood and blood vessels, capillary haemangioma; Developments of the fetus, fetal membrane and placenta, preeclampsia, structure of the placenta and circulations; Circulation and function of the placenta, Erythroblastosis fetalis and fetal hydrops; Amnion and umbilical cord, placental changes at term and end of pregnancy; Amniotic fluid, fetal memberanes in twin, twin defects, preterm, birth defects, maternal serum screening; Skeletal system: neurocranium , viscerocranium, cranio defects and skeletal dysplasia, striated skeletal musculatum, cardiac and smooth muscle; Formation of the body fluid, serous membranes. Formation of diaphragm and thoracic cavity; Formation and position of the heart tube, cardiac loop; Formation of the atrial and ventricular septa; Vascular development, umbilical veins circulation before and after birth, lungs, trachea. Development of digestive system including liver, pancreas.Urogenital system Genital system, vagina, uterine and vaginal defect, descent of testes. Head and Neck Facial defects, central nervous system: Brain, cranial nerves, autonomic nervous system. Integumentary stem, epidermis.

RGS 613 Physics of Medical Ultrasound. 2Units

The nature of sound waves, piezo-electric effect, generation and detection of ultrasound, properties of ultrasound waves, interaction of ultrasound with tissue, attenuation of ultrasound beam, focusing and steering, Doppler shift frequency and applications in ultrasound diagnosis. Vascular measurement parameters.Doppler Effect – Flow, Stenoses, Doppler Equation, Doppler Angle; Colour – Doppler Instruments – Colour-Doppler Principle, Performance and Safety – Performance Measurements, Output Measurements, Bio-effects and safety considerations.

RGS 621 Small Parts Scanning 2Units

Anatomy of the small parts, indications for scan, scanning protocols, image appreciation and critique.Breast Ultrasound, The thyroid and Parathyroid Glands, The scrotum, The Prostate Gland, The Musculoskeletal system, Penile Ultrasound.Eye ultrasound.

RGS 624 Abdominal and Pelvic Sonography 2Units

Indications for abdominal scan.review of anatomy of abdominal and pelvic organs.Scanning protocols for abdominal and pelvic organs.Image appreciation and technique.Introduction to Abdominal and Pelvic scanning Techniques and Protocols; The vascular system, - The liver; The Gall bladder and the Biliary system; The Pancreas; - The Gastrointestial Tract ; The urinary system; The spleen;The Retroperitoneum; The Peritoneal cavity and Abdominal Wall; Abdominal Applications of Ultrasound contrast Agents; Ultrasound Guided Interventional Techniques; Normal Anatomy and physiology of the female pelvisThe Sonographic and Doppler Evaluation of the female pelvis; Pathology of the uterus, ovaries and the adnexa; The role of ultrasound in evaluating female infertility.

RGS626: Echocardiography and vascular sonography 2Units

The anatomy of the heart and related vasculature; scanning protocols for 2-D echo, duplex scanner and Doppler techniques A study of vascular anatomy, physiology, hemodynamics, wave form analysis, and treatment of vascular disease; carotid duplex/color flow imaging, upper and lower extremity arterial and venous duplex/color flow imaging, and ankle brachial indices. renal, intracranial, vein mapping, hemodialysis graft, plethysmography, and venous insufficiency duplex/color flow testing including the clinical history, physical assessment, and appropriate scanning protocol.

**X-ray Transmission Computerized Tomography:**

RGS625: CT of the musculoskeletal system 2Units

Anatomy and Imaging of the Musculoskeletal System; anatomy; clinical indications;patient preparations; study protocol; guidelines for modifications; artefacts; windowing; indications and case studies of these regions.

RGS 623: Patient management and contrast media in CT 2Units

Patient assessment and communication; intravenous injections; adverse reactions and management; interventional procedures after-care.Patient Care, Radiation Safety and Medical Ethics; Ethical and Legal Issues; Patient Education and Preparation; Radiation Safety and Measuring Radiation Dose; Patient Monitoring and Code Procedures; Vital Signs; Infection Control.

RGS627: CT of the Abdomen and Pelvis 2Units

Exam procedures, labeled anatomy and case studies for exams in the chest, abdomen, pelvis and the vessels of these regions as well as special procedures including PET/CT fusion imaging, CT arthrography, CT colonography, Clinical indications, scan protocols, contrast enhanced studies, artefacts, image appreciation and technique.

RGS628: CT of the Head and Central Nervous System 2Units

Indications for CT of head and CNS, scanning protocols and modifications, patient preparations, contrast enhanced studies, artefacts, image appreciation and critique. Exam procedures, labeled anatomy and case studies for exams in the Head and Neck and the Central Nervous system, and the vessels of these regions as well as special procedures including PET/CT fusion imaging.

RGS604: Other Applications of CT 2Units

Strategies in 3D image generations.CT simulation.Dual photon bone densitometry.Radiation therapy planning with CT, cardiac synchronization, calcium scoring, and left ventricular cardiac function; Special Imaging Techniques; Positron Emission Tomography / Computed Tomography (PET/CT)

RGS614: CT Physics and Instrumentation 3Units

Physical basis for CT; reconstruction softwares, CT number, radiation dose.Computed Tomography Defined; The principles of sectional imaging Overview of CT System Components; CT Scanner Designs Including Multi-Row Detector, Electron Beam, PET/CT Scanners and Cone Beam CT in Oncology; Operator's Console; Host Computer; The Gantry; Patient Table; The CT X-ray Tube; Collimation; Detectors: Composition, Function, Single and Multi-Row; Picture Archiving and Communication System; Image Reconstruction Including Back Projection, Convolution, Iterative Reconstruction and Cone Beam Reconstruction; Retrospective Reconstruction; Retrospective Reconstruction; Volume Rendering; Filming and Archiving. CT Artifacts: Beam Hardening, Partial Volume Averaging, Motion; Metal, Edge Gradient Effect, Equipment-Induced and Cone Beam.instrumentation. Quality assurance tests.

**Magnetic resonance Imaging (MRI)**

RGS 605 Basic Physical Principles of MRI 2Units

Introductory Concepts, Nuclear Magnetism, Longitudinal and Transverse Magnetization, Resonance, Longitudinal and Transverse Relaxation, Magnetism, resonance and MR signal generation; advanced MR pulse sequences and scanner functional options, Magnetic Resonance Imaging theory and application, flow phenomena & the principles of vascular MR imaging.

RGS 615 Instrumentation and Quality assurance in MRI 2Units

Types of magnets used in MR system, types of coils, configurations and major features, encoding and image formation, slice selection and installation, requirements, shimming designs, MR system hardware, pulse sequence design, relaxation, MR equipment QA and MR facility design, MR equipment QA and MR facility design; data acquisition and processing and the physical principles of image formation. Image Weighting, MR Instrumentation, RF Coils, Technical Adjustments, Image Acquisition and Reconstruction.paramagnets and common contrast agents. Image optimization in MRI and trade-offs.

RGS 629 MR Imaging techniques for head and Central nervous System and Bones 2Units

Introduction Neuro, Brain, Cranial Nerves, Pituitary Gland, Introduction Spine, Cervical, Thoracic, Lumbar; Musculoskeletal, Shoulder, Elbow, Wrist, Knee, Foot & Ankle. Typical clinical indications, selection and modification of MR scanning techniques and imaging protocols, together with normal and abnormal MR image appearances.anatomical landmarks for imaging.; guidelines for modifications;; image appreciation and critique. Advanced Neuro.

RGS 618 Pulse sequences and Contrast Agents 2Units

MR image weighting and contrast; imaging procedures, Pulse Sequences, Imaging Parameters. Diffusion Weighted Imaging, Perfusion Weighted Imaging, Functional Imaging, MR Spectroscopy, Advanced Body Imaging: Contrast Enhanced MR Angiography, Oral & IV contrast Agents.

RGS 616 MR Imaging techniques for chest and abdomen 2Units

Clinical indications, scan protocols, guidelines for modifications.

Introduction Body, Upper Abdomen. MR Angiography.Typical clinical indications, selection and modification of MR scanning techniques and imaging protocols, together with normal and abnormal MR image appearances. with review of the principal applications in disease assessment and normal and abnormal appearances.

RGS 606 MRI Artefacts and Safety Considerations 2Units

An introduction to MR artefacts, scanning features and safety in the MR environment.MR image artefacts and avoidance strategies, particular requirements for MR imaging of paediatric patients; patient care, MR safety.patient care, MR safety. Patient Dependant Artifacts, System Dependant Artifacts, Patient Preparation, Environmental Safety, Patient Safety and Comfort

**RADIATION AND ENVIRONMENTAL PROTECTION**

RGS 631 Radiation Physics, Detection and Dosimetry: 2Units

X-ray production and angular distribution of continuous spectrum energy levels and characteristics. Raadioactive decay, chains equilibria nuclear models and Fission.Interaction of EMR with matter; slowing down and Absorption of both electrons and neutrons. Detection and dosimetry: their relationship and units of measurements. Dose metters.Gas, air and tissue equivalence.Scintillation/Solid state detectors and applications.Reactors, accelerators and isotopic sources.Measurement of activity, standards and shielding.Spectrometry and measurement techniques.Radioanalytical methods, “in vitro” and “invivo”.

RGS632 Hazard Assessment From Radioactivity, Oil Spillage etc.released into Environment: 2Units

Sources of environmental radioactivity, atmospheric Discharges and radioactive waste. Hazard assessment- principles objectives, dose limits, critical pathway analysis, emergency measures associated with reactor accidents; fission product inventory, proportions released from overhead fuel, atmospheric dispersion, emergency measures. Association with reactor accidents; fission product inventory, proportions released from overhead fuel, atmospheric dispersion, emergency reference levels and plans. Control measures for oil wells and pipelines. Strategy for assessing oil spillage monitoring programmes and safety measures.Sampling and significance of results.

RGS 633 Air Pollution from – Fuelled Industrial Processes and Aerosol Physics: 2Units

Size of the problem, fuel usage in industry.Types of Air pollutant.Large scale industrial pollution. Methods of reducing pollution-chemical gas cleaning and chimney design. Nuture of aerosol. Stokes law, settling rates (mondisperse), relaxation times. Limits of applicability to aerosol clouds.Cunningham corrections, heterogeneous aerosols and differential settler.Accelerated motion.Hidy and brock equations, laminar and turbulent flow.Brownian motion.Stokes-Einstein diffusivity, root mean square displacement Probability densities in 1, 2, 3 dimension. Coagulation, Deposition on fixed sphere by diffusion. Survey of aerosol Control devices.

RGS 634 Radiation Protection and Environmental Monitoring 2Units

Systems of dose limitations.External radiation control; industrial and medical x-ray installations, gamma and beta sources.Personnel monitoring-film badge, TLD, quartz fibre electrometers, biological monitoring.Radiation protection in factories and factory regulation. Administrative procedures and role of international bodies e.g. ICRP. Environmental monitoring. Monitoring of air, water, soil, food samples, neutral levels. Comparison of physical, chemical methods of analysis, applicability and sensitivity.Transport of radioactive materials; design of packaging, Transport regulation.

RGS 635 Nuclear Reactors, Nuclear Fuel Processing and Reactor Waste: 2Units

General survey of present nuclear power production.And nuclear fuel resources. Reactor physical: neutron induced fission, energy releases, neutron cycle in thermal reactors. Reactor control and safety of operation. Shielding and monitoring. Management of nuclear fuel.Transportation to reprocessing plant and irradiated Fuel handling.Layout of fuel reprocessing plant.Plutonium Separation and fabrication of new fuel.Classification of Radioactive waste and disposal pathways.

RGS 636 Legislation and Economics of Environmental Protection: 2Units

Legislation and organization of radiation protection in Nigeria.Anti pollution legislation.International legislation and organization.Environmental pollution optimum level and economic consequences.

RGS 637 Microwaves, Lasers and Environmental Noise: 2Units

Sources of microwaves detection and physical properties.Propagation of electromagnetic waves.Radiation of electromagnetic waves and application of Radar and microwave.Microwave diathermy, lasers, Biological hazards and safety limits.General principles of sound, vibrasion and aerodynamics propagation of sound, transmission, absorption and insulation.Physical control of noise, measurement, DB analysis and presentation of result. Noise hazards, elementary audiometry, damage risk criteria and bearing protection. Properties and sources of infrasound and ultrasound.Noise abatement legislation.

**RADIOTHERAPY AND ONCOLOGY**

RGS 612 Equipment in Radiotherapy: 2Units

Linear accelerator and Cobalt- 60 Therapy Units.Dose distribution from differenct sources. Depth doses, filters, shields, simulators and their uses. .

RGS 641 Radiobiology: 2Units

Events leading to radiation injury, initial physico-chemical and biomolecular changes.Biological effects, radiosensitizers and radioprotectors.Radiosensivity of DNA,stand breaks, repair of sublethal Damage and cell cycles. Cell death, survival curves Do,LD50. Extrapolation number target theory, and split dose experiments. Effect of ionizing radiation of the tissue level.Genetic effect, mutation and accumulation of damage.Cancer and its aetiology, carcinogenesis and radiation.

RGS 642 Electron Beam Therapy and Brachytherapy: 2Units

Accelerator for producing fast electron beams, interactions with matter, parameters for beams. Beam distribution in the patient. Methods employed in electron dosimetry. Sealed-source therapy, production and construction.Sealed-source measurement.External applicators and moulds.Intestitical therapy.Intractivitybrachy-therapy.Practical aspects of absorbed dose calculation.The safe use of sealed sources.

RGS 643 Treatment Planning: 2Units

External beam therapy machines.Radiation units.The single isodose curve.The multiple-field isodose curve pattern.Manual addition of isodose curve.Dose calculations.The patient’s radiotherapy record.

RGS 644 Clinical Radiotherapy: 2Units

The actual implementation of treatment in a clinical setting. The student is expected to carry out considerable treatment of various disease conditions assisted and unassisted.

RGS 645 Radiobiological Aspects of Radiotherapy 2Units

Radiation genetics and mutation.Types of tumoursand repair mechanism.Mechanisms of spread, cellular control mechanisms.Cancer.Biological basis for radiotherapy of human tumours.

**RADIOLOGY ADMINISTRATION AND MANAGEMENT:**

RGS 652 Health Planning, Policy Formulation and Implementation 2Units

Health planning processes, need assessment, and implementation. Health facility planning and location.Installation of models and evaluation of programme.Effectiveness.Critical examination of health policies.National policy on health. The role of medical radiographer and other professional interest groups in the health care. Hospital organization. Research and development in the health care system. Role of the world health organization and other international agencies.

RGS 653 Health Economics and Budgeting: 2Units

Examination of current thinking in the field of health economics and its role in planning health services.Overview of financial and cost accounting.Analysis of economic concepts. Health care financing, budgeting and budgetary control. Comparative allocation of resources.Options appraisal and evaluation.Cost-benefit analysis (CBA) and application.Total and marginal costing etc.medical audit, quality assurance, inventory control health issuance. Financial accounting, records and management.

RGS 654 Health Personnel and Office Management: 2Units

Executive management lines of Authority, Management by committees. Job evaluation, design and analysis.Recruitment and selection, performance appraisal.Delegation of functions.Organization of meetings.Decision making and communication techniques. Forms and styles of leadership. Leadership and staff training and welfare scheme.Managerial function and supervisory techniques.Human resources management and development in health services system.Office administration, records and management.

RGS 655 Dynamics of Health Management: 2Units

Analytical evaluations of specific cases peculiar to health care delivery system: sectoralanalysis of health policy implementation. Professional dynamics: Resources utilization.

RGS 656 Health Care Environment and Organizational Behaviour: 2Units

Purpose of organization and structure. Communication processes. Health information system records and statistics. Professional responsibility and information control. Inter-departmental and intersectoral relationships.Group dynamics.Formal and informal group influence. Health services organization. Public and industrial relations.Principles of collective bargaining and joint consultative council. Evaluation and application of management principles in health care practices. Politics of health care delivery. Professionalism in the health care system. Comparative health care.

RGS 657 Health Laws and Regulations: 2Units

General principles of Nigerian law, law of tort, Contract and negligence, national, state and local legislations on health policy. Law of equity.Workmen Compensation act and pension scheme.Professional Responsibilities and the law.Ethics and practices. Occupiers Liability: Medical confidentiality.

**RADIOLOGICAL EDUCATION:**

RGS651 Educational Administration and Planning in Radiography and Radiological Sciences: 2Units

Medical radiography and radiological education in Nigeria. Staff-personnel administration, student-personnel administration, student-personnel administration, school plan, finance and business management.

RGS661 Curriculum Planning in Medical Radiography and Radiological Sciences Education: 2Units

Intensive study in theory and practice of curriculum.Radiological education and curriculum theory.A model for devising and appropriate curriculum theory for Nigeria.

RGS662 Educational Innovations in Medical Radiography and Radiological Sciences: 2Units

Concept of Innovation. Relevant innovation and radiological education.Process of innovation and barrier factors.

RGS 663 Educational Psychology in Medical Radiography 2Units

Critical analysis and evaluation of selected warning theories. Learning environments.Learning disabilities.

**DOCTOR OF PHILOSOPHY (PhD.) IN MEDICAL RADIOGRAPHY**

**Philosophy, Objectives and Scope:**

Medical Radiography and Radiological Sciences involves the use of ionizing and other forms of radiant energies in the diagnosis, treatment and management of diseases and is in indispensable arm of modern medical science being the pivot of modern diagnostic medicine.

The postgraduate programme of this Department is based on identified need to provide graduates of Medical Radiography and other suitably qualified candidates opportunity to undertake advanced and specialized professional studies in medical radiography, radiological sciences and related areas. These areas are presently experiencing acute shortage of manpower both in the private and public sectors of the economy.

It is designed to widen the knowledge, skill and employment opportunities of the graduates in the key specialties of the profession including radiation and environmental protection.

**Programme Objectives and Scope:**

The programme are aimed at providing students with up-to-date theoretical, practical and interdisciplinary skills required in the various specializations of the subject. The scope of the programme will include specialization in any of the following areas:-

* Medical imaging
* Radiation and Environmental Protection
* Radiological Education
* Radiotherapy and Oncology
* Radiology Administration and Management

**Employment Opportunities:**

The present acute shortage of qualified medical radiographers and radiological scientists in Nigeria and Africa makes the job prospects very bright for graduates of this Department. Successful graduates of these programmes are equipped for career in clinical medical imaging including medical ultrasound, computerized tomography and radiotheraphy in private and government owned health establishments all over the nation. Career opportunities also exist in research institutions for the fabrication of components in x-ray technology. Tertiary health and educational institutions are grossly understaffed in these specialties including the ever-expanding area of environmental protection agency to mention a few.

**Areas of Specialization:**

Students will have the option of specializing in any of the following areas:

1. Medical imaging
2. Radiation and Environmental Protection
3. Radiological Education
4. Radiology Administration and Management
5. Radiotherapy Technology and Oncology

**Stress Areas:**

1. Research Methodology
2. Instrumentation
3. Imaging Modalities and Optics
4. Radiation and Environmental Protection
5. Therapy Technology
6. Administration
7. Education
8. Seminar
9. Anatomy/Physiology/Pathology
10. Thesis

**Entry Requirement:**

The following may qualify for admission into Degree of Doctor of Philosophy (Ph.D)

* Graduates of the University of Nigeria or of other recognized universities whohave obtained the degree of Master in Medical Radiography or related area with a CGPA of at least 4.0/5.0
* The candidates must have five credit passes in English, Mathematics, Physics, Biology, and Chemistry: Qualifying exam for undergraduate admission in the department.
* Candidates must have a minimum of second class lower division in Bachelor’s degree from an approved university with a CGPA of 3.0/5.0.

**Mode of Study:**

The PhD degree Programme is to be prosecuted by coursework and comprehensive research to be embodied in a thesis and also seminars. The coursework will have written examinations that involve external moderation. The seminars are approved by the department and should be in-depth and critical discourse on topics in the candidate’s specialty and research. There shall be three (3) seminars. The research work embodied in the thesis should be defended before an external examiner appointed by the university. The research should be an original contribution to knowledge in the candidate’s specialty.

Candidates may be required to register for courses the department directs are necessary to improve knowledge and research capabilities of the student. The courses shall be determined by the department but should not exceed twelve credit units. Candidates who wish to prosecute PhD in other areas of specialization in the department must do the coursework in that area.

**Duration of the Programme:**

The minimum duration of the Degree of Doctor of Philosophy (Ph.D) Programmes shall be as follows:

* Full-time: A minimum of 6 semesters

A maximum of 10 semesters

* Part-time: A minimum of 8 semesters

A maximum of 14 semesters

**Requirements for Graduation**

The candidate must pass all registered courses, present all seminars and defend the thesis before a panel with an external examiner appointed by the university.

**COURSEWORK**

**First Semester**

|  |  |  |
| --- | --- | --- |
| Course Codes | Course Title | Units |
| RGS 703 | Advanced Research Methodology | 3 |
| PGC 701 | Synopsis and Grant Writing | 3 |
| RGS 721 | Entrepreneurship Studies | 3 |
| RGS 711 | Current trends in radiography practice | 4 |
| Total | | 13 Units |

**Second Semester**

|  |  |  |
| --- | --- | --- |
| Course Codes | Course Title | Units |
| RGS 772 | Research seminars I | 2 |
| RGS 774 | Research Seminars II | 2 |
| RGS 776 | Research Seminars III | 2 |
| RGS 592 | Thesis | 12 |
| Total | | 18 Units |

**PhD Coursework in Medical Radiography and Radiological Sciences**

RGS 703 Advanced Research Methodology 2Units

Introduction to research; Philosophies and the language of research theory building; Thinking like a researcher; Problems and Hypotheses; Research design; Methods of data collection; Attitude measurement and scaling; Questionnaire designing – Reliability and Validity; Sampling techniques; Processing and analysis of data; Ethical issues in conducting research; Report generation, report writing, and APA format. Critical thinking skills; Critiquing research; Proposal writing; Academic Dishonesty: Cheating, plagiarism.

PGC 701 Synopsis and Grant Writing 3Units

Identification of types and nature of grants and grant writing: mining of grant application calls on the internet. Determining appropriate strategy for each grant application. Study of various grant application structures and contents and writing of concept notes, detailed project description, budgeting and budget defense. Study of sample grant writings in various forms and writing of mock research and other grants. Identification of University of Nigeria synopsis structure and requirements (Introduction, Methodology and Results). Determining the content of each sub-unit of the synopsis. Steps in writing the synopsis from the Dissertation/Thesis document. Structural and Language Issues. Common errors in synopsis writing and strategies for avoiding them. The roles of the student and supervisor in the production of synopsis. All registered PhD students must attend a solution-based interactive workshop to be organized by the School of Post-Graduate Studies for a practical demonstration and application of the knowledge acquired from the course, conducted by selected experts.

RGS 721 Entrepreneurship Studies 2Units

Entrepreneurship: Definition and philosophy, History, and Role within the economy; Entrepreneurship in different contexts: Social, Organizational and Individual; Types of new ventures: Franchises, Family businesses, Business-within-a-business (entrepreneurship), and Start-ups; Entrepreneurial style: Nature vs. Nurture, Strengths and weaknesses, Sustainable across time and organizational settings; Creative problem-solving: Courage to create, Overcoming obstacles, Selling your idea to others; The entrepreneurial management process: Opportunity and the entrepreneur, Analyzing and testing opportunity, Preparing for the future - planning for growth; Business concepts/models: From solution to innovative product/service, From product/service to business concept (value proposition), From business concept to feasibility study; Ethics and social responsibility: Dilemmas and choices (partners vs. solo, money and control, technology and innovation, etc.), Giving back to the community, Case studies; Entrepreneurs as role models: Famous (and not so famous) entrepreneurs and what we can learn from them, Differences in experience and leadership style.

RGS 711 Current trends in radiography practice 2Units

Tele-radiology; Diagnostic imaging in emergency room; Interventional radiology; US of tendons and muscles; Molecular imaging; Osteoporosis imaging; Nanotechnology in imaging; Team building and Team working.

RGS 772 Research seminars I 2Units

Candidates present seminar on topics in the candidate’s specialty.

RGS 774 Research Seminars II 2Units

Candidates present seminar on topics in the candidate’s specialty.

RGS 776 Research seminars III 2Units

Candidates present seminar on topics in the candidate’s specialty and research.

**DEPARTMENT OF MEDICAL REHABILITATION**

**LIST OF APPROVED POSTGRADUATE SUPERVISORS OF DEPT OF MEDICAL REHABILITATION, FHST, UNEC**

|  |  |
| --- | --- |
| **Professors** | **Area of Specialisation** |
| G.C. Okoye  *MBBS(Lagos), PhD* | Bio-Engineering |
|  |  |
| **Senior Lecturers** |  |
| S.C. Ibeneme  *BMR(PT), MSc, PhD(Nig.)* | Clinical Gait Analysis |
| A.O. Ezeukwu  *BMR(PT), MSc(Ibadan), PhD(Benin)* | Orthopaedic/Sports Physiotherapy and Exercise Physiology |
| **Lecturer I** |  |
| C.I. Ezema  *BMR(PT), MSc, PhD(Nig.), PhD(EBSU)* | Neurological Physiotherapy and Exercise Physiology |

**INTRODUCTION**

The Department of Medical Rehabilitation offers postgraduate programmes leading to Master of Science (MSc), MSc/PhD and PhD in Physiotherapy. Postgraduate programmes in other areas of Medical Rehabilitation are being developed.

**PHILOSOPHY**

The philosophy of the programme is to position the Postgraduate Physiotherapy programme to produce world-class, knowledgeable, competent and educated men and women with advanced skills for professional services to their environment.

**OBJECTIVE:**

The Postgraduate Physiotherapy programme of the Department of Medical Rehabilitation is designed to develop in-depth knowledge and advanced research and clinical skills in an approved specialised area of physiotherapy (subject to the availability of sufficient supervisory expertise in that area). A key fulcrum of this is to develop and maintain sound evidence-based knowledge in physiotherapy, to develop innovative thinking and problem-solving abilities, to develop proficiency in data collection and interpretation of results, to gain independence in research and scientific writing skills, to investigate and utilise funding opportunities, to disseminate research findings, including publications in peer-reviewed international scientific journals and presentations at local and international conferences

**SCOPE OF THE PROGRAMME**

**Available Postgraduate Programmes in Physiotherapy include:**

i. M.Sc. (Physiotherapy)

ii. M.Sc/PhD (Physiotherapy)

iii. Ph.D. (Physiotherapy)

**ENTRY REQUIREMENTS:**

1. **MSc Admission**

Candidates for admission into M.Sc (Physiotherapy) Programme must possess the following:

1. A first degree in Physiotherapy with a minimum of second class lower division from a recognised University or an unclassified degree in Physiotherapy
2. A current registration with the Medical Rehabilitation Therapists Board of Nigeria.
3. A minimum of two years post-qualification working experience as a Physiotherapist in a recognized institution.
4. **MSc/PhD Admission**
5. Candidates who hold the M.Sc. (Physiotherapy) degree or its equivalent but who obtained a GPA of less than 60% or a GPA of less than 4 point on a 5 point
6. Conversion from M.Sc/PhD to Ph.D shall be done in accordance with existing regulations of the postgraduate school of the University.
7. Candidate who hold a first degree in Physiotherapy but obtained an MSc in another field.
8. Must be currently registered with the Medical Rehabilitation Therapist Board of Nigeria
9. **PhD Admission**
10. Candidates who hold an M.Sc. (Physiotherapy) degree or its equivalent from an recognized institution but who obtained at least a GPA of 60% or a GPA of 4 point on a 5 point scale
11. Candidates who hold an M.Phil degree in Physiotherapy but who obtained a GPA of at least 60% or a GPA of not less than 4 point on a 5 point scale.
12. Must be currently registered with the Medical Rehabilitation Therapist Board of Nigeria

**MODE OF STUDY**

1. Candidates must register as full time students. In special cases, Part-time registration may be allowed provided the facilities for the candidates work are adequate and supervision is effective throughout the period of registration.
2. MSc, M.Sc/PhD and PhD Physiotherapy programmes are made up of course work, seminars, advanced clinical physiotherapy practice, physiotherapy education research seminar and project report/thesis.

**DURATION OF THE PROGRAMME:**

**MSc**

**Full-Time:** A minimum of 3 semesters

A maximum of 5 semesters

**Part-Time:** A minimum of 4 semesters

A maximum of 6 semesters

**M.Sc/PhD**

**Full-Time:** A minimum of 8 semesters

A maximum of 12 semesters

**Part-Time:** A minimum of 10 semesters

A maximum of 14 semesters

**PhD**

**Full-Time:** A minimum of 6 semesters

A maximum of 10 semesters

**Part-Time:** A minimum of 8 semesters

A maximum of 12 semesters

**EMPLOYMENT OPPORTUNITIES**

Physiotherapists work in many places, including private practice, sports facilities, hospitals, schools and universities, public health organisations, community centres, aged-care facilities and workplaces. Some physiotherapists pursue a clinical career assessing and treating patients; others pursue a career in academia to undertake research to further the evidence base for assessing and treating patients and to teach physiotherapy students; others mix a clinical career with academia.

**AREARS OF SPECIALIZATION:**

i. Cardio-Pulmonary Physiotherapy

ii. Neurological Physiotherapy

iii. Musculoskeletal Physiotherapy

iv. Exercise and Sports Physiotherapy

v. Women’s Health Physiotherapy

vi. Paediatric Physiotherapy

vii. Community Physiotherapy

**STRESS AREAS**

0= Clinical Practice

1= Foundational Course I

2= Foundational Course II

3= Specialty Course (Cardiopulmonary and Neurology)

4= Specialty Course (Musculoskeletal/Exercise/Sports)

5= Specialty Course (Women’s Health and Paediatrics)

6= Specialty Course (Community Physiotherapy)

7= Research Methods/Biostatistics

8= Seminar

9=Project Report/Thesis

**LIST OF COURSES**

**FIRST SEMESTER –MSc (Physiotherapy)**

1. **COMPULSORY/GENERAL COURSES**

|  |  |  |
| --- | --- | --- |
| **COURSE NO** | **COURSE TITLE** | **UNITS** |
| PHT 601 | Advanced Clinical Practice 1 | 3 |
| PHT 611 | Advanced Clinical Reasoning, Measurement And Instrumentation In Physiotherapy | 3 |
| PHT 613 | Motor Control/Learning And Physical Performance In Health And Disease | 2 |
| PHT 615 | Pain, Pain Syndromes & Palliative Care In Physiotherapy | 2 |
| PGC 601 | ICT, Research Methodology And Biostatistics | 3 |
|  |  |  |

1. **CORE COURSES BY AREA OF SPECIALIZATION**

**Cardiopulmonary Physiotherapy**

|  |  |  |
| --- | --- | --- |
| PHT 631 | Advanced Cardiac and Respiratory Anatomy/Physiology | 3 |
| PHT 633 | Clinical Electrocardiography | 3 |

**Neurological Physiotherapy**

|  |  |  |
| --- | --- | --- |
| PHT 635 | Advanced Integrative and Clinical Neuro-Science | 3 |
| PHT 637 | Cognitive and Behavioural Issues in Neuro-Rehabilitation | 3 |

**Musculoskeletal Physiotherapy**

|  |  |  |
| --- | --- | --- |
| PHT 641 | Manipulative Therapy | 3 |
| PHT 643 | Orthopaedic Physiotherapy Including Traumatology and Rehabilitation | 3 |

**Exercise And Sports Physiotherapy**

|  |  |  |
| --- | --- | --- |
| PHT 645 | Advanced Exercise And Sports Science | 3 |
| PHT 647 | Clinical Exercise And Sports Injury | 3 |

**Women’s Health Physiotherapy**

|  |  |  |
| --- | --- | --- |
| PHT 651 | Pelvic Floor Muscle Rehabilitation | 3 |
| PHT 653 | Women Through Life Stages | 3 |

**Paediatric Physiotherapy**

|  |  |  |
| --- | --- | --- |
| PHT 655 | Paediatric Neuro-physiotherapy | 3 |
| PHT 657 | Paediatric Musculoskeletal Physiotherapy | 3 |

**Community Physiotherapy**

|  |  |  |
| --- | --- | --- |
| PHT 665 | Population Based Physiotherapy Practice | 3 |
| PHT 667 | Health Promotion and Preventive Physiotherapy Services | 3 |

**SECOND SEMESTER –MSc (Physiotherapy)**

1. **COMPULSORY/GENERAL COURSES**

|  |  |  |
| --- | --- | --- |
| COURSE NO | TITLE | UNIT |
| PHT 602 | Advanced Clinical Practice II | 3 |
| PHT 681 | Seminar I | 3 |
| PHT 622 | Principles Of Sociology And Enterpreneurial Studies In Physiotherapy | 3 |
| PHT 672 | Physiotherapy Research And Dissemination | 3 |

1. **CORE COURSES BY AREA OF SPECIALIZATION**

**Cardiopulmonary Physiotherapy**

|  |  |  |
| --- | --- | --- |
| PHT 632 | Cardio-respiratory Disorders And Advanced Rehabilitation | 3 |
| PHT 634 | Intensive Care Physiotherapy | 3 |

**Neurological Physiotherapy**

|  |  |  |
| --- | --- | --- |
| PHT 636 | Infant Neuromotor Development, Disorders And Advanced Rehabilitation | 3 |
| PHT 638 | Neurological Disorders And Advanced Rehabilitation (Upper and lower motor neuron lesion) | 3 |

**Musculoskeletal Physiotherapy**

|  |  |  |
| --- | --- | --- |
| PHT 642 | Functional Clinical Anatomy And Diagnostics In Musculoskeletal Disorders | 3 |

**Exercise and Sports Physiotherapy**

|  |  |  |
| --- | --- | --- |
| PHT 646 | Theories Of Competitive Sports And Exercise Training | 3 |
| PHT 644 | Advanced Clinical Biomechanics | 3 |

**Women’s Health Physiotherapy**

|  |  |  |
| --- | --- | --- |
| PHT 652 | Continence And Women’s Health | 3 |
| PHT 654 | Maternal And Child Health | 2 |

**Paediatric Physiotherapy**

|  |  |  |
| --- | --- | --- |
| PHT 656 | Paediatric Cardiorespiratory Physiotherapy | 3 |
| PHT 658 | Children In Difficult Circumstances | 2 |
| PHT 654 | Maternal And Child Health | 2 |

**Community Physiotherapy**

|  |  |  |
| --- | --- | --- |
| PHT 668 | Community Based Rehabilitation | 3 |

**THIRD SEMESTER–MSc (Physiotherapy)**

|  |  |  |
| --- | --- | --- |
| PHT 683 | Seminar II | 3 |
| PHT 690 | Research Project | 6 |
|  |  |  |

**LIST OF COURSES- PhD (Physiotherapy)**

**FIRST YEAR- PhD (Physiotherapy)**

**1ST SEMESTER**

|  |  |  |
| --- | --- | --- |
| **COURSE CODE** | **COURSE TITLE** | **UNIT** |
| PHT 771 | Critical Analysis and Research | 3 |
| PHT773 | Applied Quantitative Analysis in Physiotherapy Research | 3 |
| PHT 775 | Applied Qualitative Analysis in Physiotherapy Research | 3 |

**2ND SEMESTER**

|  |  |  |
| --- | --- | --- |
| PHT 712 | Advanced Clinical Assessment And Diagnosis In Physiotherapy | 3 |
| PGC 701 | Research Grant Writing And Synopsis Writing | 3 |

**SECOND YEAR- PhD (Physiotherapy)**

|  |  |  |
| --- | --- | --- |
| PHT 781 | Doctoral Seminar I | 3 |
| PHT 782 | Doctoral Seminar II | 3 |

**THIRD YEAR- PhD (Physiotherapy)**

|  |  |  |
| --- | --- | --- |
| PHT 783 | Doctoral Seminar III | 3 |
| PHT 790 | Doctoral Thesis | 12 |

**COURSE DESCRIPTION**

**Course description for MSc (Physiotherapy)**

**First Semester**

**PHT 601: Advanced Clinical Practice I**

Rotational Clinical Practice through the major fields of practice in physiotherapy. Fields practice include Neurology, Cardio-pulmonary Orthopaedics, Sports, Paediatric and Community Physiotherapy **(3 Credit Units).**

**PHT 611: Advanced Clinical Reasoning, Measurement and Instrumentation in Physiotherapy**

Principles involved in Clinical Measurement and Evaluation and their application in practice of physiotherapy, review of measurement concepts and terminology. Measurements of muscle performance, range of motion and functional activities. Methods of measuring patient outcome for clinical and research purposes. Electronic fundamentals applied to measuring instruments and their basic components as used in Physiotherapy. Overview of biophysical instrumentation; Basic electronics and circuits; display and measuring devices; Electrodes, Transducers; amplifiers and filters **(3 credit units)**.

**PHT 613: Motor Control/learning and Physical Performance in Health and Disease**

The nature of human motor actions. How efficient motor skills are developed and controlled, from both cognitive and dynamical systems approaches, and their classification and measurement. The integrated development of perception and action, how to design motor development programs. The integration of theory and practical work develops key competencies for teaching skill development. A theory and practical course on the attainment and maintenance of appropriate physical fitness level in healthy individuals and patients. Definitions and components of physical fitness, field and laboratory, applicability of various tests in health and disease. A review of activities for the purpose of health promotion and the analysis of various sports and recreational activities for their health promoting values **(3 credit units)**.

**PHT 615: Pain, Pain Syndromes and Palliative Care in Physiotherapy**

An interdisciplinary approach to the management of pain disorders/syndromes aimed at encouraging professional collaboration. Pain experience of patients and the physiological, psychosocial, and environmental components of that experience, with an application of profession-specific theoretical frameworks to assess and manage pain and disability. Physiotherapy care of clients experiencing chronic illness and/or end of life. Understanding the "lived experience" of clients and families. Ethical issues related to advocacy, self-determination, and autonomy. Evidence-based practice is used to support appropriate focused assessments and management of care of clients experiencing concurrent illnesses/co-morbidities**(2 Credit units)**

**PGC 601 ICT, RESEARCH METHODOLOGY AND BIOSTATISTICS**

In-depth research work aimed at acquiring full knowledge and presentations in scholarly writing of the concepts, issues, trends in the definition and development of statistics. Major steps in research selection of problem, Literature review, Design, Data collection, analysis and Interpretation, Conclusions. Study of various research designs, Historical, Case studies, Surveys, Descriptive, Cross Sectional, Experimental, etc. Analysis, Surveys and Synthesis of conceptual and philosophical foundations of statistics. Identification of research problems and development of research objectives and hypotheses. Method of project/dissertation writing. Application of appropriate advanced ICT tools relevant for data gathering, analysis and result presentation. Essentials of spreadsheets. Internet technology, Internet search engines, Statistical packages, Principles of Scientific Research. All registered Master’s Degree students must attend a solution based interactive workshop to be organized by the School of Postgraduate Studies for a practical demonstration and application of the knowledge acquired from the course, conducted by selected experts **(3 Units)**

**PHT 631: Advanced Cardiac and Respiratory Anatomy/Physiology**

Lung structure and function: Ventilation - perfusion relationships. Respiratory Anatomy and physiology in usual environments. Tests of Pulmonary function. Cardiovascular Anatomy and physiology, including central control of blood pressure and flow regulation. An integrative approach toward how the cardiovascular system is coordinated with overall body function. Principles of exercise physiology integrated into the clinical setting, with emphasis on cardiovascular and pulmonary diseases. Exercise adaptations and examples of pathophysiology **(3 credit units).**

**PHT 633: Clinical Electrocardiography**

Exploration of heart conduction, arrhythmia, and clinical significance of electrocardiography with an emphasis on clinical application. This course is designed to give the student a solid, basic overview of electrocardiography (ECG/EKG). Heart anatomy and physiology, exploration of physiology and pathophysiology of various rhythms of heart conduction. Sinus, atrial, junctional, and ventricular rhythms as well as heart blocks will be studied. Bundle branch blocks and hemi-blocks, myocardial infarctions, electrolyte abnormalities and EKG’s from other coronary and non-coronary conditions. Diagnostic role of EKG plays in a clinical setting **(3 credit units)**.

**PHT 635: Advanced Integrative and Clinical Neuroscience**

Aspects of the control nervous system in health and in disease: Sensory coding; reflex functions motor control; effect of drugs in the CNS; physiological aspects of memory. Applied Neuroscience and evolving role of Physiotherapy **(3 credit units).**

**PHT 637: Cognitive and Behavioural issues in Neuro-Rehabilitation**

Psychological processes underpinning perception, attention, memory, and motor planning. An investigation of how these processes may be disrupted by a variety of neurological conditions. Subjective and behavioural aspects of neurological dysfunction are discussed in the context of rehabilitation **(3 credit units)**.

**PHT 641: Manipulative Therapy**

The principles, theory and application of advanced techniques of mobilization and manipulation on selected peripheral and spinal joint syndromes. Appraisal of the various management techniques and school of thought e.g Maitland, McKenzie, Cyriax etc **(3 credit units)**.

**PHT 643: Orthopaedic Physiotherapy Including Traumatology and Rehabilitation**

In advanced study of the causes, incidence pathology and clinical features of soft-tissue and skeletal disorders (Traumatic and Non-Traumatic ) and the general principles of their physical management . Principles and techniques of physiotherapy related to prevention, correction and treatments of physical dysfunction resulting from sports injuries **(3 credit units)**.

**PHT 645: Advanced Exercise and Sports Science**

Integrated regulation of organ systems during exercise and sports in applied settings spanning chronic disease through elite sport will be examined. Mechanisms of adaptation, environmental stress, ergogenic aids, novel training approaches, limitations to exercise in healthy normal individuals, and well-trained and elite athletes, facilitating recovery, overtraining, and shortfalls in the exercise physiology knowledge base. Role of exercise in the prevention, diagnosis, prognosis and treatment of chronic disease **(3 credit units)**.

**PHT 647: Clinical Exercise and Sports Injury**

Role of exercise in the management of sports injuries and chronic health conditions. For sports injuries, prevention, acute management and optimal rehabilitation will be addressed. For chronic disease, the pathophysiological process,adaptations to regular exercise and influence on the metabolic, hormonal, muscular and neurological sequelae of disease. Detraining in the setting of illness and injury and impacts on physiological and metabolic responses leading to deconditioning **(3 credit units)**.

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**PHT 651: Pelvic Floor Muscle Rehabilitation**

An advanced approach to the study of structure, function and dysfunction of the pelvic floor and application of exercise physiology, motor control theory, and pain mechanisms to the pelvic floor and pelvic floor muscle rehabilitation. Assessment of the pelvic floor using interview, observation, palpation, manometry, real-time ultrasound, and electromyography. Physiotherapy management of bladder and bowel dysfunction, pelvic organ prolapse, sexual dysfunction, and pelvic pain and dysfunction using education, exercise, and electrophysical agents. Measurement of outcomes of pelvic floor muscle rehabilitation **(3 credit units)**.

**PHT 653:Women through Life Stages**

Advanced study of female growth and development and the health conditions that are unique, more common, more serious, or require different interventions in women. Development of advanced skills in clinical reasoning and evidenced based practice for the assessment and management of women's health including: education, exercise, manual therapy, electrophysical therapy, and behavioural modification for the optimisation of perinatal, bone, and sexual health; prevention and management of the sequelae of breast and pelvic oncology. Interprofessional promotion of women's health **(3 credit units)**.

**PHT 655: Paediatric NeuroPhysiotherapy**

Theoretical understanding and some practical experience in the specialist physiotherapy management of Paediatric Neurological and neuromuscular conditions (including chronic, acute, congenital and rare disorders). Standardised assessments of movement and function in children with neurological and neuromuscular disorders **(3 credit units)**.

**PHT 657: Paediatric Musculoskeletal Physiotherapy**

Theoretical understanding and some practical experience in the specialist physiotherapy management of paediatric musculoskeletal conditions (including chronic, acute, congenital and rare disorders). Assessment of function, joints, muscles, pain and gait throughout childhood**(3 credit units)**.

**PHT 665: Population Based Physiotherapy Practice**

Scope of population based public health Physiotherapy process. Principles or “cornerstones” underlying the practice of public health Physiotherapy. Public health Physiotherapy interventions and the best practices associated with their successful implementation**(3 credit units)**.

**PHT 667: Health Promotion and Preventive Physiotherapy Services**

Value of and barriers to disease prevention and health promotion (DP/HP), how to identify and use federal public health data sets, factors that influence personal health decisions, preventive interventions directed at individuals (clinical settings) and populations (community settings), strategies for using population health principles to integrate DP/HP into routine clinical and public health practice, and the organization of federal agencies that fund DP/HP activities. Emerging roles of Physiotherapy **(3 credit units)**.

**Second Semester-MSc(Physiotherapy)**

**PHT 602: Advanced Clinical Practice II**

Rotational Clinical Practice through the student field/area of specialization. The course may involve clinical work experience off-campus in any geographical area where student may gain the necessary experience. Attendance/Presentation at workshop/seminar/certifications in the candidates area of specialty may form an integral aspect of the course as may be determined by the Departmental PG board. at This will culminate in an assessment by the departmental experts**(3 credit units)**.

**PHT 681: Seminar I**

A pre-field seminar based on the candidates area of research interest for the MSc **(3 credit units)**.

**PHT 622: Principles of Sociology and Enterpreneural Studies in Physiotherapy**

The course focuses on sociological concepts in the analysis of the causes and distribution of illness; health and medical orientation; patterns of utilization of health services; comparative analysis of health delivery system, analysis of provision and patronage of health and preventive services, medical professions and socialization of health professionals **(3 credit units).**

**PHT 672: Physiotherapy Research and Dissemination**

Practical exercises in literature searching skills and referencing in long documents, critical evaluation of literature: including levels of evidence, systematic and narrative reviews. Academic writing skills: including structure and format of different academic documents and practical exercises in writing, reviewing and editing documents, dissemination of research work, formulating and answering clear clinical questions. Verbal presentation skills: including practical exercises using voice, body language and effective audiovisual aids. Clinical practice and research (different methods of outcome evaluation statistically and clinically important changes: p values, confidence intervals, numbers needed to treat) and the process of outcome measurement within the context of clinical practice and research. The research process in terms of process, planning and presentation **(3 credit units)**.

**PHT 632: Cardio-Respiratory Disorders and Rehabilitation**

Review of respiratory anatomy and physiology. Application of basic concepts and techniques in Physiotherapy involvement in health promotion and management of patients with acute and chronic pulmonary disorders. Application of basic concepts and techniques in physiotherapy involvement in health promotion and management of patients with acute, sub-acute and chronic heart (cardiac) and circulatory (vascular) disorders. **(3 credit units)**

**PHT 634: Intensive Care Physiotherapy**

An advanced study of the general principles of physical management of intensive or acute care cases. It will cover; Effects of Anaesthesia on the respiratory, circulatory, and musculoskeletal systems. Pre-operative management and complications**(3 credit units)**.

**PHT 636: Infant Neuromotor Development and Disorder**

Emphasis on the neuromotor development of the human fetus, neonate and infant. Damages and disorders of the neuromotor development and physiotherapy management and rehabilitation by conventional and special methods such as Bobath etc **(3 credit units).**

**PHT 638: Neurological Disorder and Rehabilitation (Upper And Lower Motor Neurone Lesions)**

Cellular basis of clinically relevant perturbations to the nervous system. Particular reference will be made to the efficacy of rehabilitative interventions in lower motor neurons lesions. Degenerative changes following a peripheral nerve lesion (PNL) and regenerative processes. Techniques of assessment and Physiotherapy management of PNL and the place of orthotic appliances. Cellular basis of clinically relevant perturbation to the nervous system with particular reference to the efficacy of rehabilitative interventions in upper motor neurons lesions. (3 credit units)

**PHT 642: Functional Clinical Anatomy and Diagnostics in Musculoskeletal Disorders**

Structural and applied anatomy, and pathology of the vertebral column and peripheral regions, relevant to musculoskeletal physiotherapy. Anatomical adaptations with respect to function, the impact of pathology on function, responses to injury, healing and repair processes in musculoskeletal structures, and how these may be influenced by physical treatment. Pathology, clinical features and diagnostic methods related to disorders commonly presenting in musculoskeletal physiotherapy practice is also covered.

**PHT 644: Advanced Clinical Biomechanics**

acquisition of kinematic, kinetic and electromyographic data, variable generation and analysis of biomechanical variables used to measure movement. The instrumentation and methodologies to acquire this data will allow a number of specific skilled movements to be analysed. The strengths and weaknesses and limitations of the methodologies will be evaluated

**PHT 646: Theories of Competitive Sports and Exercise Training**

Critical study of motor ability, their development through various training methodologies the process of training periodization and planning. (3 credit units)

Performance enhancement through mental skills training. Preparation for critical performances and approaches to dealing with not meeting expectations. Developing psychological resiliance. Psychological burn-out. Coaching and the psychology of coaches. Problems of Women athletes/ adolescent athletes/ aging athletes & disabled athletes

**PHT 652: Continence and Women’s Health**

Advanced study of the development of the anatomy, physiology, and pathophysiology of micturition and defecation; bladder and bowel function and dysfunction in women(young, middle aged and elderly); and health promotion for the bladder and bowel. Development of physiotherapy clinical skills and clinical reasoning relevant to evidenced based and interprofessional practice in the assessment and physiotherapy management of incontinence and/or voiding, defecation and female sexual dysfunction

**PHT 654: Maternal and Child Health in developing Countries**

Introduction to maternal and child health in developing countries; maternal morbidity and mortality; antenatal care; safe motherhood: essential obstetric care. Cultural and social considerations in maternal and child health programmes. Parenting and family planning. Child health: common conditions and their causes, interventions in child health. Nutritional issues in maternal and child health. Programme considerations in maternal and child health.

**PHT 656: Paediatric Cardiopulmonary Physiotherapy**

Differences between adults and children, lung growth and development, cardiac embryology and development of the pulmonary circulation. Knowledge of paediatric cardiorespiratory physiotherapy in intensive care, which includes an understanding of mechanical ventilation and weaning from the ventilator, paediatric respiratory physiotherapy assessment including x-ray interpretation, an understanding of the use of manual techniques in intensive care. Develop and understanding of the role of respiratory physiotherapy in neonates. Asymptomatic patient and the use of airway clearance devices. Respiratory management of patients with neuromuscular disease, which includes non-invasive ventilation and long-term ventilation

**PHT 658: Children in difficult Circumstances**

Children in difficult circumstances include street children, children exploited through labour, children exposed to violence and sexual abuse, disabled children, orphans and children with HIV. Problems facing these children both in the Nigeria and around the world. It examines the underlying causes and explores some of the potential solutions.

**PHT 668: Community Based Rehabilitation**

Global perspectives of community based rehabilitation (CBR) as a strategy for

equalization of opportunities, social inclusion and participation of persons with disabilities. It prepares students to design, implement and evaluate CBR programs for and with persons with disabilities internationally by using a gender sensitive and human rights based approach. Students will examine basic CBR concepts and frameworks, health and disability policy, global partnerships, education and training strategies, the World Health Organization CBR Guidelines as well as their application in a variety of CBR programs globally

**PHT 683: Seminar II**

A detailed written pre-synopsis presentation of the result of the candidate’s MSc research

**PHT 690: Research Project**

Work on a research project under the supervision of a faculty member. Outcome of work must add to knowledge. Prior approval of the student's supervisor is required. Also prior presentation of a departmental seminar on the topic is required (3 units).

**PhD Course Description**

**PHT 771: Critical Analysis and Research**

Demonstrate the ability to critically evaluate scientific literature and apply the scientific method in Physiotherapy.

**PHT 773: Applied Quantitative Analysis in Physiotherapy Research**

Statistical inference, simple regression, multiple regression, regression assumptions, regression with categorical predictors, model selection methods polynomial regression, and model validation as applied to Physiotherapy research.

**PHT 775: Applied Qualitative Methods in Physiotherapy Research**

This course constructs a conceptual and methodological bridge between the understandings of qualitative research developed in Qualitative Methods I and more advanced study of theories, designs, and methods. The focus is on theory, approaches to data analysis, and interpretation

**PHT 712: Advanced Clinical Assessment and Diagnosis in Physiotherapy**

Demonstrate an understanding of physiotherapy assessment and diagnosis in line with best international standards. Culminates in presentation of finding at professional conferences or publication in peer review journals.

**PGC 701 RESEARCH GRANT WRITING AND SYNOPSIS WRITING**

Identification of types and nature of grants and grant writing: mining of grants application calls on the internet. Determining appropriate strategy for each grant application. Study of various grant application structures and contents and writing of concept notes, detailed project description, budgeting and budget defense. Study of sample grant writings in various forms and writing of mock research and other grants. Identification of University of Nigeria synopsis structure and requirements (Introduction, Methodology and Results). Determining the content of each sub-unit of the synopsis. Steps in writing the synopsis from the Dissertation/Thesis document. Structural and Language issues. Common errors in synopsis writing and strategies for avoiding them. The roles of the students and supervisor in the production of a synopsis. Writing of mock synopsis. All registered Ph.D students must attend a solution-based interactive workshop to be organized by the School of Postgraduate Studies for a practical demonstration and application of the knowledge acquired from the course, conducted by selected experts.

**PHT 781: Doctoral Seminar I:**

Detailed written presentation of the candidate’s PhD topic proposal.

**PHT 782: Doctoral Seminar II**

A written presentation on issues, theories and current academic debate in the candidates area of specialty. This should culminate in a systematic review or meta-analysis on a topic related to the candidates PhD research

**PHT 783: Doctoral Seminar III**

A detailed written pre-synopsis presentation of the result of the candidate’s PhD research.

**PHT 790: Doctoral Thesis**

Independent research on topic approved by student’s graduate committee. Its evaluation will be based on a proposal approved by the faculty and final thesis report

**DEPARTMENT OF NURSING SCIENCES**

|  |  |
| --- | --- |
|  | ***A. NAME OF DEAN/ASSOCIATE DEAN OF THE FACULTY HEALTH SCIENCES AND***  ***TECHNOLOG*** |

***B LIST OF HEADS OF DEPARTMENT OF NURSING SCIENCES WITH THEIR YEARS OF HEADSHIP***

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| ***S/N*** | ***NAMES OF STAFF*** | ***YEAR OF***  ***HEADSHIP*** | ***CURRENT STATUS*** | ***PERMANT/CONTRACT/***  ***RETORED*** |
| 1 | Prof. (Mrs.) C.B. Okafor | 1983 – 1986 | Professor | On Contract |
| 2 | Dr. (Mrs.) G.U. Madubuko | 1986 – 1992 | Senior Lecturer | Retired |
| 3 | Dr. (Mrs.) N.P. Ogbonnaya | 1992 – 2002 | Senior Lecturer | Permanent |
| 4 | Dr. P.O. Ezenduka | 2002 – 2004 | Senior Lecturer | Transferred Out |
| 5 | Dr. E.I. Nwonu | 2004 – 2006 | Senior Lecturer | Permanent |
| 6. | Dr. (Mrs.) I.O. Ehiemere | 2006 – 2008 | Senior Lecturer | Permanent |
| 7 | Dr. (Mrs.) I.L. Okoronkwo | 2008 – 2009 | Senior Lecturer | Permanent |
| 8 | Dr. (Mrs.) A.N. Anarado | 2009 – 2012 | Senior Lecturer | Permanent |
| 9  10. | Dr. (Mrs.) V.U. Okolie  Dr. Ada C. Nwaneri | 2012 – 2014  2014 to date | Senior Lecturer  Senior Lecturer | Transferred Out  Permanent |

***C. LIST OF APPROVED POSTGRADUATE SUPERVISORS***

|  |  |  |
| --- | --- | --- |
| ***S/N*** | ***NAMES*** | ***QUALIFICATIONS*** |
| 1 | Dr. (Mrs.) N.P. Ogbonnaya | Ph.D, M.,Ed, B.Sc., RN/RM |
| 2 | Dr. (Mrs.) I.O. Ehiemere | Ph.D, M.Sc, B.Sc, RN/RM |
| 3 | Dr. (Mrs.) I.L. Okoronkwo | Ph.D, MBA, M.Sc. PGD, RN/RM |
| 4 | Dr. (Mrs.) A.N. Anarado | Ph.D M.Sc, B.Sc, RNC, RN/RM |
| 5 | Dr. Ada C. Nwaneri | Ph.D, M.Ed, B.Sc, RNE, RN/RM |
| 6 | Dr. (Mrs.) A.U. Chinweuba | Ph.D, M.Ed, M.Sc, B.Sc, RN/RM |

**MASTER OF SCIENCES DEGREE IN NURSING**

**INTRODUCTION:**

The Department of Nursing Sciences offers postgraduate programmes leading to the award of Master of Science (M.Sc) and/or Doctor of Philosophy (PhD) degrees in the following major areas of Nursing.

1 Community Health Nursing

2 Maternal and Child Health Nursing.

3 Medical Surgical Nursing.

4 Mental Health and Psychiatric Nursing.

5 Nursing Administration and Management

6 Nursing Education.

**PHILOSOPHY**

Man is a bio-psycho-social, spiritual being with mental abilities, needs and expectations. Man’s needs and expectations are on flux as a result of societal changes and technological advances.

The core of nursing is caring to meet the needs and expectations of the clients in ways that enhance their quality of life and satisfaction.

The goal of nursing at the postgraduate level therefore should be to prepare nurses that are sensitive to the changing needs and expectations of man and have the right knowledge, skills and attitude to use current technology to appropriately diagnose, develop, and implement evidence-based nursing strategies that will meet the needs and expectations of the consumers of nursing care.

**AIMS AND OBJECTIVES**

The programme is designed to produce highly competent expert nurse specialists with knowledge, skills and attitude to:

1. Function independently and collaboratively to improve the science and art of nursing.

2. Utilize critical and reflective thinking to design and implement evidence-based care that

meets the needs and expectations of the consumers of nursing care.

3. Assume leadership role in initiating innovative changes in nursing services administration

and management, health and wellness promotion and disease prevention, teaching and

research.

**SCOPE**

The programme covers six (6) specialty areas, in clinical aspects of nursing profession, education and research work.

**ENTRY REQUIREMENTS**

**Entry Requirements for M.Sc Programme**.

Graduates of the University of Nigeria or other recognized Universities who have obtained the appropriate degree of Bachelor in Nursing (B.Sc. or B.N.SC) with at least second class honours or it’s equivalent. Candidate must be registered with the Nursing and Midwifery Council of Nigeria (N&MCN) as a registered Nurse and have a current licence to practice in Nigeria. Other selection considerations include Grade Point Average of not less than 2.5 on a 5 point scale or its equivalent, availability of supervisors, areas of special need, and applicant’s submission of all application requirements as in PG school admission guideline.

**Entry Requirements for Master’s/Ph.D Programme**

▪ A candidate with Master’s degree with GPA of 4.0 on a 5 – point scale from a related Department/discipline who wishes to do a Ph.D work in Nursing, he/she must be admitted for Masters/Ph.D degree programme.

▪ Candidates must have five credit passes in English, Mathematics, Biology, Chemistry and Physics at O’Level.

▪ Candidates must have Bachelors Degree in Nursing from an approved University with CGPA of 3.5 on a 5 – point scale.

▪ Candidates with professional Master’s in Nursing with a GPA of 4.0 on a 5-point scale will be eligible for admission into Master’s/Ph.D programme.

**Mode of Study**

The Master’s degree programme, is by course work to be examined in written papers together with research work to be presented as dissertation to be defended in an oral examination before an external examiner. The candidates are required to take a minimum load of 16 units and maximum of 28 units each semester before graduation.

Each student shall carry out a research work on issues related to nursing and health care service. Also, each student is required to present a research seminar in student’s area of specialty.

For a candidate who registered for Masters/Ph.D degree: the candidates may be required to register all or audit any of the M.Sc courses depending on candidates discipline and on the recommendation and approval of the Departmental Postgraduate Studies Committee.

A firm registration for the Doctor of Philosophy may be approved if the result of the assessment of the student’s programme shows that the student attained a minimum of 4.00 GPA in his/her coursework. Then the candidates should register the courses listed for them for the Ph.D programme.

**Duration of study for M.Sc Programme**

Full-Time 3 semesters (18 Calendar months) Minimum

6 semesters (3 Calendar years) Maximum

Part-Time 4 semesters (2 Calendar years) Minimum

8 semesters (4 Calendar years) Maximum

***Duration of Masters’/Ph.D programme***

Full-Time 6 semesters (3calendar years) Minimum

10 Semesters (5 Calendar years)

Part-Time 8 Semesters (4 Calendar years) Minimum

12 Semesters (6 Calendar years) Maximum

**Stress Areas Stress No.**

Advanced concepts of professional Nursing 0

Medical –Surgical Nursing 1

Community Health Nursing 2

Nursing Administration and Management 3

Maternal and Child Health Nursing 4

Mental Health and Psychiatric Nursing 5

Nursing Education 6

Professional posting 7

Dissertation 8

**Scoring and Grading**

Scoring and grading of courses shall follow the guideline in which the percentage scores are interpreted in letter grade (A – F) and grade points (0 – 5) as displayed in the table below:

**Grading System for Postgraduate Programmes**

|  |  |  |
| --- | --- | --- |
| Percentage Score | Letter Grade | Grade Points |
| 70 – 100 | A | 5 |
| 60 – 69 | B | 4 |
| 50 – 59 | C | 3 |
| 0 – 49 | F | 0 |

**Award of Degrees**

The degrees of M.Sc in Nursing are awarded to only candidates who have passed all prescribed courses, seminars and other conditions prescribed by the postgraduate school. A Master’s candidate who makes a GPA of less than 2.50 in a semester shall be required to withdraw from the programme. The minimum pass mark for any course work is 50%; 30% shall constitute continuous assessment and 70% shall be from examination score.

**Employment Opportunities**

The postgraduate programme in nursing is designed to equip graduates for careers in clinical services, administration and management, education and research at all levels of health care and educational institutions, as well as corporate organizations and other relevant agencies.

**PROGRAMME STRUCTURE**

**CORE COURSES**

**FIRST SEMESTER**

|  |  |  |
| --- | --- | --- |
| COURSE NO | TITLE | UNITS |
| PGC 601 | ICT and Research Methodology | 3 |
| NSC 701 | Legal and ethical Aspects of Professional development in Nursing | 2 |
| NSC 725 | Wellness and Health Promotion | 2 |
| NSC 733 | Health Economics | 2 |
| NSC 781 | Advanced Statistics in Health Technology | 2 |

**TOTAL 11 Units**

**SECOND SEMESTER**

|  |  |  |
| --- | --- | --- |
| COURSE NO | TITLE | UNITS |
| NSC 702 | Advanced Concepts & Theoretical Foundations of Nursing | 3 |
| NSC 704 | Nursing Informatics | 2 |
| NSC 732 | Nursing Entrepreneurship | 2 |

**TOTAL 7 Units**

**THIRD SEMESTER (FIELD WORK)**

|  |  |  |
| --- | --- | --- |
| COURSE NO | TITLE | UNITS |
| NSC 761 | Professional Posting in Specialty Areas | 4 |
| NSC 783 | Nursing Seminar | 2 |
| NSC 791 | Dissertation | 6 |

**TOTAL 12 Units**

**M.Sc. SPECIALISATIONS**

Candidates should register the courses relevant to the various specializations as listed below

**MEDICAL SURGICAL NURSING**

**FIRST SEMESTER**

|  |  |  |
| --- | --- | --- |
| COURSE NO | TITLE | UNITS |
| NSC 711 | Concepts and Principles of Medical Surgical Nursing | 2 |
| NSC 713 | Management of Selected Acute/Chronic Medical-Surgical  Conditions | 3 |
| NSC 715 | Critical Care Nursing | 2 |

**TOTAL 7 Units**

**First Semester Electives (Only one course)**

**Course No. Title Units**

NSC 717 Gerontology Nursing 2

NSC 731 Principles of Health and Policy System, Planning and Administration 3

NSC 727 Environmental & Occupational Health 2

NSC 775 Guidance & Counseling 2

**SECOND SEMESTER**

|  |  |  |
| --- | --- | --- |
| COURSE NO | TITLE | UNITS |
| NSC 712 | Palliative Care & Rehabilitation Nursing | 2 |
| NSC 714 | Oncology Nursing | 2 |

**TOTAL 4 Units**

**Second Semester Electives (Only 2 Units)**

**Cou**rse No. Title **Units**

NSC 734 Advanced Public Relations in Health Practice 2 NSC 752 Advanced Community Mental Health /Psychiatric Nursing 2

**COMMUNITY HEALTH NURSING:**

**FIRST SEMESTER**

|  |  |  |
| --- | --- | --- |
| COURSE NO | TITLE | UNITS |
| NSC 721 | Theories and Practice of Community Health Nursing | 3 |
| NSC 723 | Epidemiology in Nursing | 2 |
| NSC 727 | Environmental & Occupational Health | 2 |

**TOTAL 7 Units**

**First Semester Electives (Only one course)**

Course No. Title  **Units**

NSC 717 Gerontology Nursing 2

NSC 731 Principles of Health and Policy System, Planning and Administration 3

NSC 775 Guidance & Counseling 2

**SECOND SEMESTER**

|  |  |  |
| --- | --- | --- |
| COURSE NO | TITLE | UNITS |
| NSC 722 | Principles and Practice of Primary Health Care and Family Health | 2 |
| NSC 724 | Programme Planning & Evaluation | 3 |

**TOTAL 5 Units**

**Second Semester Electives (Only 2 Units)**

**Cou**rse No. Title **Units**

**N**SC 712 Palliative Care & Rehabilitation Nursing 2

NSC 734 Advanced Public Relations in Health Practice 2

NSC 752 Advanced Community Mental Health/Psychiatric Nursing 2

**NURSING ADMINISTRATION AND MANAGEMENT**

**FIRST SEMESTER**

|  |  |  |
| --- | --- | --- |
| COURSE NO | TITLE | UNITS |
| NSC 731 | Principles of Health and Policy Systems , Planning and Administration | 3 |
| NSC 735 | Health and Nursing Service Administration & Management | 3 |

**TOTAL 6 Units**

**First Semester Electives (Only 2 Units)**

Course No. Title Units

NSC 717 Gerontology Nursing 2

NSC 727 Environmental & Occupational Health 2

NSC 775 Guidance & Counseling in Nursing 2

**SECOND SEMESTER**

|  |  |  |
| --- | --- | --- |
| COURSE NO | TITLE | UNITS |
| NSC 734 | Advanced Public Relations in Health Practice | 2 |
| NSC 736 | Human Resource Planning & Management in Nursing | 3 |

**TOTAL 5 Units**

**Second Semester Electives (Only 2 Units)**

**Cou**rse No. Title Units

NSC 712 Palliative Care& Rehabilitation Nursing 2 NSC 752 Advanced Community Mental Health/Psychiatric Nursing 2

**MATERNAL AND CHILD HEALTH NURSING**

**FIRST SEMESTER**

|  |  |  |
| --- | --- | --- |
| COURSE NO | TITLE | UNITS |
| NSC 741 | Family Theories & Dynamics | 2 |
| NSC 743 | Contemporary Issues in Women’s Health, Programmes &Policies. | 2 |
| NSC 745 | Care of expectant families through Antenatal, Intra and Post Partum Period /Maternal and Infant Nutrition. | 3 |

**TOTAL 7 Units**

**First Semester Electives (Only one course)**

Course No. Title **Units**

NSC 727 Environmental & Occupational Health 2 NSC 731 Principles of Health and policy systems, planning and Administration 3 NSC 775 Guidance & Counseling in Nursing 2

**SECOND SEMESTER**

|  |  |  |
| --- | --- | --- |
| COURSE NO | TITLE | UNITS |
| NSC 742 | Contemporary Issues in Children’s & Newborn’s, Health, Programmes and Policies. | 2 |
| NSC 744 | Issues in contraception, infertility & sexually transmitted infections. | 2 |
| NS 746 | Neonatology/Paediatrics | 2 |

**TOTAL 6 Units**

**Second Semester Electives (Only one course)**

**Cou**rse No. Title **Units**

**N**SC 712 Palliative Care & Rehabilitation Nursing 3 NSC 734 Advanced Public Relations in Health Practice 2

NSC 752 Advanced Community Mental Health /Psychiatric Nursing 2

**MENTAL HEALTH AND PSYCHIATRIC NURSING**

**FIRST SEMESTER**

|  |  |  |
| --- | --- | --- |
| COURSE NO | TITLE | UNITS |
| NSC 751 | Life Cycle Approach in Mental Health & Psychiatry | 3 |
| NSC 753 | Advanced Concepts in, and approaches to Management of Mental Health/Psychiatric Problems. | 3 |
| NSC 775 | Guidance and Counselling | 2 |

**TOTAL 8 Units**

**First Semester Electives (Only one course)**

Course No. Title Units

NSC 727 Environmental & Occupational Health 2 NSC 731 Principles of Health and policy systems, planning and Administration 3

**SECOND SEMESTER**

|  |  |  |
| --- | --- | --- |
| COURSE NO | TITLE | UNITS |
| NSC 752 | Advanced Community Mental Health and Psychiatric Nursing | 2 |
| NSC 754 | Nursing Management of Selected Mental Health/Psychiatric Problems. | 2 |
| NSC 756 | Psycho-Pathology of Mental Health/Psychiatric Conditions | 3 |

**TOTAL 7 Units**

**Second Semester Electives (Only 2 Units)**

**Cou**rse No. Title  **Units**

**N**SC 714 Palliative Care and Rehabilitation Nursing 2

NSC 734 Advanced Public Relations in Health Practice 2

**NURSING EDUCATION**

**FIRST SEMESTER**

|  |  |  |
| --- | --- | --- |
| COURSE NO | TITLE | UNITS |
| NSC 771 | Curriculum Development in Nursing. | 2 |
| NSC 773 | Measurement and Evaluation in Nursing | 2 |
| NSC 775 | Guidance and Counseling in Nursing | 2 |
|  | **REQUIRED ANCILLIARY COURSE** |  |
| EDU. 500 | Philosophy of Education | 2 |

**TOTAL 8 Units**

**First Semester Electives (Only one course)**

**Course No. Title Units**

NSC 717 Gerontology Nursing 2

NSC 727 Environmental & Occupational Health 2 NSC 731 Principles of Health and Policy Systems, Planning and Administration 3

**SECOND SEMESTER**

|  |  |  |
| --- | --- | --- |
| COURSE NO | TITLE | UNITS |
| NSC 772 | Educational Psychology Applied to Nursing | 2 |
| NSC 724 | Fundamentals of Nursing Educational Administration. | 2 |
| NSC 776 | Teaching Learning Process and Continuing Education Methods Applied to Nursing. | 2 |

**TOTAL 6 Units**

**Second Semester Electives (Only 2 Units)**

**Cou**rse No. Title **Units**

NSC 712 Palliative Care and Rehabilitation Nursing 2 NSC 734 Advanced Public Relations in Health Practice 2

NSC 752 Advanced Community Mental Health/Psychiatric Nursing 2

**COURSE DESCRIPTIONS**

**PGC 601 ICT AND RESEARCH METHODOLOGY** (3 Units)

In-depth research work aimed at acquiring full knowledge and presentations in scholarly writing of the concepts, issues, trends in the definition and development of statistics. Major steps in research selection of problem, Literature review, Design, Data collection, analysis and Interpretation, Conclusions. Study of various research designs, Historical, Case studies, Surveys, Descriptive, Cross Sectional, Experimental, etc. Analysis, Surveys and Synthesis of conceptual and philosophical foundations of statistics. Identification of research problems and development of research objectives and hypotheses. Method of project/dissertation writing. Application of appropriate advanced ICT tools relevant for data gathering, analysis and result presentation. Essentials of spreadsheets. Internet technology, Internet search engines, Statistical packages, Principles of Scientific Research. All registered Master’s Degree students must attend a solution based interactive workshop to be organized by the School of Postgraduate Studies for a practical demonstration and application of the knowledge acquired from the course, conducted by selected experts.

**NSC 701 LEGAL AND ETHICAL ASPECTS OF PROFESSIONAL DEVELOPMENT IN NURSING** (2 Units)

The first part of the course covers definition of key concepts; Evolution of health

law, sources of health law, right to health; and overview of the Nigerian health care delivery system; Legal framework of health care decision-making, including professional self-regulation, government regulation; etc Ethical issues in nursing profession and resolution of ethical conflicts.

In the second part emphasis is on informed consent; right to die, right to

treatment, medical malpractice, HIV/AIDS; etc. Treatment relationship,

including ethical and legal problems in modern medicine/nursing, Nigeria nurse-

practice act/laws, selected legal case studies and implications on nursing; Human

right and laws, health care institutions; Reproductive health rights; right to

procreate or not to procreate, abortion and surrogacy.

**NSC 702 ADVANCED CONCEPTS & THEORETICAL FOUNDATIONS OF NURSING**

(3 Units)

The course is designed to expose students to concepts, philosophical beliefs/values and issues that influence health and disease, healthcare design, approaches, and nursing care delivery with emphasis on how nurses can promote and enhance individual and group/family responsibility in health decisions and behaviour. Furthermore, the course discusses advances in the methods, and roles of nursing theory development, theory based nursing practice and the caring process.

**NSC 702 ADVANCED CONCEPTS & THEORETICAL FOUNDATIONS OF NURSING**

(3 Units)

The course is designed to expose students to concepts, philosophical beliefs/values and issues that influence health and disease, healthcare design, approaches, and nursing care delivery with emphasis on how nurses can promote and enhance individual and group/family responsibility in health decisions and behaviour. Furthermore, the course discusses advances in the methods, and roles of nursing theory development, theory based nursing practice and the caring process.

**NSC 704 NURSING INFORMATICS** (2 Units)

Concept of nursing informatics, foundations of nursing informatics, nursing use of information system, nursing aspect of health information system, applications of nursing information to clinical and administrative practices. Education and research applications. Infrastructural elements of the informatics environment, professional nursing informatics. Computer applications in health/nursing, data processing, storage, programming. Problems and prospects of use of computer in health sciences.

**NSC 711 CONCEPTS AND PRINCIPLES OF MEDICAL SURGICAL NURSING**

(2 Units)

Medical surgical nursing is the foundation of all nursing practice. This course discusses the evolution of medical-surgical nursing from an entry- level position to its current distinct position as a specialty with sub-specialties. The content includes the nature, scope, standards of medical-surgical nursing practice; it’s expanded and advanced practice roles; the clinical knowledge and skills required to practice in this specialty.

**NSC 712 PALLIATIVE CARE AND REHABILITATION NURSING (2 Units)**

Describes the management of patients whose disease is not responsive to treatment. Emphasis is on improvement of quality of life and symptom management and support for clients and their families and delivery of appropriate culture sensitive care till the end of life.

It also discussesrehabilitation nursing: Principles of rehabilitation, referral systems, community resources for rehabilitation.

**NSC 713 MANAGEMENT OF SELECTED ACUTE/CHRONIC MEDICAL/SURGICAL CONDITIONS** (3 Units)

Discusses current advances in medical and surgical management of acute and chronic diseases that contribute significantly to the disease burden of the country. Emphasis is on the role of advanced nurse practitioner/clinician in their control and prevention.

**NSC 714 ONCOLOGY NURSING** (2 Units)

Cancer as a chronic illness. The course discusses the scope, responsibilities and goals of cancer nursing, client and family support through a wide range of physical, emotional, social, cultural and spiritual crises of the cancer trajectory; and cancer prevention

**NSC 715 CRITICAL CARE NURSING**  (2 Units)

Deals with human responses to life threatening problems. The nursing care of critical care clients is highly skilled with monitoring and high intensity interventions facilitated by the use of high technology equipments. How these impact on the quality of care and the caring process in critical care units will be discussed.

**NSC 717 GERONTOLOGY NURSING** (2 Units)

Population change and dynamics as well as challenges of the growing population of older adults is the focus of this course. Content include concept and theories of aging and ethical issues associated with aging; Strategies and interdisciplinary approaches to health conditions commonly found among the aged. Principles of healthy aging and cultural peculiarities of aging process, as well as policy issues.

**NSC 721 THEORIES AND PRACTICE OF COMMUNITY HEALTH NURSING**

(3 Units)

Theories/models in community health nursing; the nature of community health nursing, community health practice, community health diagnosis, family and community as clients of care; school health practice, contemporary issues in community health.

**NSC 722 PRINCIPLES AND PRACTICE OF PRIMARY HEALTH CARE**

**AND FAMILY HEALTH** (3 Units)

Primary Health Care (PHC) is recognized as a critical component of any health service, with the potential to improve the efficiency and effectiveness of the whole system. This course discusses the antecedents of primary health care with an emphasis on the application of the principles to practice; The World Health Organization (WHO) framework of primary health care as a philosophy, a set of activities and a strategy for organizing health services; its relationship to individuals, families and communities; Family health issues; Current issues in

health care delivery and organization; Cultural and management issues in relation to primary health care; practical skills for students in analyzing and evaluating health services in a variety of settings; in making comparisons between them and identifying capacities and opportunities for change.

**NSC 723 EPIDEMIOLOGY IN NURSING** (2 Units)

General introduction; Epidemiologic triad; epidemiological theories; Screening, Reliability and validity of instrument for screening; Basic concepts in Epidemiology, Methods in epidemiology, Application of epidemiologic concepts in community oriented nursing practice, critiquing research findings. Comparism groups, cohort studies.

**NSC 724 PROGRAMME PLANNING AND EVALUATION**  (2 Units)

Programme definition, objective, formulation and process. Review of techniques and standards, programme planning methods, programme planning model for community, advanced planning and evaluation models.

**NSC 725 WELLNESS AND HEALTH PROMOTION** (2 Units)

Definitions and dimensions of wellness; promotion of healthy lifestyles and Resiliency factors. Health beliefs/practices, Health model, Healthcare systems; comparison of wellness-health continuum with traditional medical continuum. Health promotion programmes, Healthy people 2010. Food supplement, origin, utilization and contemporary issues associated with them.

**NSC 727 ENVIRONMENTAL AND OCCUPATIONAL HEALTH** (2 Units)

Provides a comprehensive overview of the relationship of the environment and human health. Discusses concepts and theories central to environmental health ecologic perspectives, evolution of environmental and occupational health; global environmental concerns, occupational health safety programmes and health acts; legal issues; occupational health hazards; Occupational health nursing.

**NSC 731 PRINCIPLES OF HEALTH AND POLICY SYSTEM, PLANNING AND ADMINISTRATION**  (3 Units)

This course will cover evolution of health services in Nigeria with policy implications, Nigerian health care delivery system, functions and goals of health systems, introduction to health policy/health policy framework, Universal health coverage, power and policies, Roles and functions of the three tiers of government with policy implications. It will also cover a review on the evolution of management thought and theories of management, management decision making, the role of authority, responsibility, delegation and accountability in effective health management. Principles and benefits of planning, organization of health services, health planning programme, implementation and evaluation. Principles of monitoring and evaluation of health programmes.

**NSC 732 NURSING ENTREPRENEURSHIP** (2 Units)

History of entrepreneurship, basic concepts of entrepreneurship, role of entrepreneurship in personal and national growth and development; entrepreneurship power, skill, characteristics of a nurse entrepreneur; types of enterprise a nurse entrepreneur can establish, formation of NGOs; Resource mobilization. Marketing concept and orientation, products and price, business ownership, growth and succession planning, business plan, financial analysis and management, time and risk management.

**NSC 733** **HEALTH ECONOMICS** (2 Units)

Basic concepts and principles of economics and health economics will be discussed with particular reference to choice and decision making in healthcare organizations. The course also examines the special nature of health and health care goods; the principles of demand and supply; market failures in health sector, government intervention and investment in health; Importance of funds in the management of health service; General overview of methods of economic analysis, Equity analysis.

**NSC 734 ADVANCED PUBLIC RELATIONS IN HEALTH PRACTICE** (2 Units)

Examines the need of PR in health nursing services, the role of PR in the context of health services; various theories of human & industrial relations; processes of collective bargaining and professionalism in nursing.

**NSC 735 HEALTH AND NURSING SERVICES ADMINISTRATION AND**

**MANAGEMENT** (3 Units)

Organization and administrative theories and application to health and nursing organizations, issues in nursing manpower development and utilization. A conceptual framework in the management of health and nursing services which utilizes the input, process and outcome of care; the dimensions of quality and quality improvement

**NSC 736 HUMAN RESOURCE PLANNING AND MANAGEMENT**

**IN NURSING** (3 Units)

Focus is on effective human resource practice; human resource planning and development; relationship between management, organization and the environment. Job analysis, Job design, Recruitment and selection, performance appraisal. Decentralization, participation and inter-sectoral coordination, decision making and focus of leadership.

**NSC 741** **FAMILY THEORIES AND DYNAMICS** (2 Units)

Dimensions of family health units, roles, functions and relationships between family, individuals and community, home health care; family counseling; theoretical perspectives on the health problems and nursing management of selected high risk pregnant mothers/children and other means of promoting family health and preventing illness.

**NSC 742 CONTEMPORARY ISSUES IN CHILDREN’S AND NEWBORN’S HEALTH, PROGRAMMES AND POLICES** (2 Units)

Improving the well-being of children and newborns is an important public health goal for Nigerians. This course therefore discusses evidence based strategies to improve health policies, programmes and practices for children, and newborns locally and globally; Theories, practices and interventions that contribute to an understanding of socio-cultural and other influences that impact the health and wellness of children and newborns with emphasis in Nigeria.

**NSC 743 CONTEMPORARY ISSUES IN WOMEN’S HEALTH, PROGRAMMES AND POLICIES**  (2 Units)

Theories, practices and interventions that contribute to an understanding of cultural and other influences that impact on the health and wellness of women with emphasis in Nigeria. Health of women will be discussed in a holistic manner, using the life cycle approach. Emphasis will be on the social and cultural factors that impact the health of women in Nigeria.

**NSC 744 ISSUES IN CONTRACEPTION FERTILITY, AND SEXUALLY TRANSMITTED INFECTIONS** (2 Units)

The course will critically examine current interventions and approaches managing the above issues in the light of various ethical, legal, moral/religious and other socio-psychological influences.

**NSC 745** **CARE OF EXPECTANT MOTHERS THROUGH ANTENATAL, INTRA AND POSTNATAL PERIOD/MATERNAL AND INFANT NUTRITION**

(2 Units)

The utilization of research findings in the care of uncomplicated child bearing family from ante partum period through intra-partum period to 6 weeks postpartum. Nursing process is the tool for management. Independent practice, early referral and collaborative client care with other members of the health team, form the basis for practice. Application of concepts of human nutrition in mother and baby. Approaches to optimal maternal and infant/child nutrition during pregnancy, lactation and beyond; Concept of exclusive breast feeding and weaning; Socio-cultural, factors in maternal child nutrition. Critique of current trends and policies of maternal and child/infant nutrition

**NSC 746 NEONATOLOGY/PAEDIATRICS** (2 Units)

Every prospective parent looks forward to the arrival of a healthy baby. Sadly for some, this dream is shattered when the presence of some form of abnormality is recognized at birth or in the neonatal period. This course entails the review the characteristics of normal newborns discuss those conditions that suggest deviation from normal during infancy such as respiratory problems and infections; Chromosomal abnormalities and genotic malformations among others. It also high-lights the nurse/midwives’ roles and responsibilities in primary prevention, early diagnosis, appropriate intervention and referral as necessary. It emphasizes the midwives’ involvement in emergency situations and operative interventions, and newborn special care.

**NSC 751 LIFE CYCLE APPROACH IN MENTAL HEALTH AND**

**PSYCHIATRY** (2 Units)

The course reviews theories of human growth and development, developmental stages and milestones. Theories underlying psychiatric mental health care and management; construct of general systems and psycho-dynamics of behaviour underlying childhood, adolescent, adulthood and psychiatric practice/care. Childhood and adolescent psychiatry, psychiatry of the aged.

**NSC 752** **ADVANCED COMMUNITY MENTAL HEALTH/PSYCHIATRIC**

**NURSING** (2 Units)

Reviews concepts and principles of community mental health nursing, identification, development, and utilization of community mental health resources towards optimum mental health of the community. Community mental health services in Nigeria. Components of community mental health care. Processes of early diagnosis and identification of mental disorders in the community. Community care of the mentally ill, resources for the care of the mentally ill in the community, and health education and counseling in the community.

**NSC 753** **ADVANCED CONCEPTS IN AND APPROACHES TO MANAGEMENT OF MENTAL HEALTH/PSYCHIATRIC PROBLEMS** (3 Units)

The course presents analysis/review of multiple determinants of behaviour for designing and implementing interventions; Communication, and assessment techniques (eg interviewing). Current treatment milieu/modalities, activity therapy, group and individual psychotherapy. Review of Science of psychiatric pathology and Sociology basic to psychiatric nursing practice; Application of Scientific concepts and principles to psychiatric nursing interventions. Role of the nurse in

various treatment options. Psychotherapy and counseling, behaviour modification and social support.

**NSC 754 NURSING MANAGEMENT OF SELECTED MENTAL HEALTH/PSYCHIATRIC PROBLEMS**  (2 Units)

Reviews psychiatric mental health nursing. Nursing application of psychiatric concepts in the management of organic and functional psychiatric, affective and psychosomatic disorders and conditions; neurotic disorders and ritualistic behaviuor. Anxiety disorders and personality, impulse disorders and substance related disorders, and disorders of self regulation.

**NSC 756 PSYCHO-PATHOLOGY OF MENTAL HEALTH/PSYCHIATRIC CONDITIONS**  (3 Units)

Reviews basic concepts of the mind and mental health. Personality development across the life span and adjustment mechanisms/emotional disorders, concept of mental health and mental illness. Psychopathological basis of mental illness. Review of neuro-anatomy, Biological basis of behavior/mental disorders. Mental health assessment of children, adolescents, and the elderly. Risk factors for childhood psychopathology, psychological testing, learning disorders.

**NSC 771 CURRICULUM DEVELOPMENT** **IN NURSING**

(2 Units)

General introduction to education, general aims, philosophy and types of Education. Nature, scope, models of nursing education and practice. History/Trends and advances in nursing education, factors affecting nursing education and reforms in nursing education. The curriculum development process, implementation and evaluation. Elements of the curriculum. The nursing educational programme. Administration of the school.

**NSC 772 EDUCATIONAL PSYCHOLOGY APPLIED TO NURSING** (2 Units)

Introduction to educational psychology, science of education, methods of educational psychology. Review of growth and development. Concept and nature of learning. Critical analysis and evaluation of selected learning theories. Factors affecting learning. Individual differences and learning. Psychological motivations of learning. Mental hygiene and adjustment of learners. Learning disabilities.

**NSC 773** **MEASUREMENT AND EVALUATION IN NURSING** (2 Units)

Overview of basic terms in measurement and evaluation. Educational objectives as basis for test and measurement. Developing/Designing and construction of specific types of classroom tests (teacher made tests). Establishing the psychometric properties of generated test items. Test administration, scoring and interpretation of test results. Testing for specific human abilities. Statistical concepts and application in test and measurement. Trends and issues in school testing. Clinical skills education and measurement.

**NSC 774 FUNDAMENTALS OF EDUCATIONAL ADMINISTRATION** (2 Units)

Basic concepts and theories in educational administration as applied to nursing institutions in Nigeria. Acquisition of knowledge & skills to manage nursing educational programmes; Comparative analysis of factors affecting administration of nursing; laws and regulations governing nursing education, School planning, finance and management.

**NSC 775 GUIDANCE AND COUNSELING IN NURSING** (2 Units)

Concept and Principles of guidance and counseling;, origin and development of guidance and counseling; component and resources of guidance and counseling, personal characteristic of effective counselor. Ethical issues in counseling practice; theories and techniques of counseling, counseling in health, elements of individual and group counseling.

**NSC 776 TEACHING AND LEARNING PROCESS AND CONTINUING**

**EDUCATION METHODS APPLIED TO NURSING** (2 Units)

General introduction to teaching and learning process. Fundamental basis of teaching, methods of teaching. Devices and techniques of teaching. Audio-Visual aids in education. Mass media and technological media in education. Micro teaching, curriculum teaching plan. Problem based learning. Survey of the wide range of methods and techniques of conducting learning for adults through course of study, informal groups, workshops, conferences, on the job training, mass media programmes, and community development projects. Continuing education methods applied to Nursing (Online Education, Workshops/Seminars, Part-Time etc).

**NSC 781 ADVANCED STATISTICS IN HEALTH TECHNOLOGY** (2 Units)

Techniques of study and measurement of health populations, Health data; Statistical techniques (Biostatistics) Application of quantitative and qualitative techniques to health care delivery and utilization.

**NSC 783** **NURSING SEMINAR** (2 Units)

Course is designed to present an analytical framework to enable students focus on a number of issues in health field related to their specialty areas. Topics to be approved by course coordinator; Critical appraisal of seminar presentations by faculty members.

**DOCTORAL (PhD) PROGRRAMME**

**INTRODUCTION:**

The Department of Nursing Sciences offers postgraduate programmes leading to the award of Doctor of Philosophy (PhD) degrees in the following major areas of Nursing.

1 Community Health Nursing

2 Maternal and Child Health Nursing.

3 Medical Surgical Nursing.

4 Mental Health and Psychiatric Nursing.

5 Nursing Administration and Management

6 Nursing Education.

**PHILOSOPHY**

Man is a bio-psycho-social, spiritual being with mental abilities, needs and expectations. Man’s needs and expectations are on flux as a result of societal changes and technological advances.

The core of nursing is caring to meet the needs and expectations of the clients in ways that enhance their quality of life and satisfaction.

The goal of nursing at the postgraduate level therefore should be to prepare nurses that are sensitive to the changing needs and expectations of man and have the right knowledge, skills and attitude to use current technology to appropriately diagnose, develop, and implement evidence-based nursing strategies that will meet the needs and expectations of the consumers of nursing care.

**AIMS AND OBJECTIVES**

The programme is designed to produce highly competent expert nurse specialists with knowledge, skills and attitude to:

1. Function independently and collaboratively to improve the science and art of nursing.

2. Utilize critical and reflective thinking to design and implement evidence-based care that

meets the needs and expectations of the consumers of nursing care.

3. Assume leadership role in initiating innovative changes in nursing services administration

and management, health and wellness promotion and disease prevention, teaching and

research.

**SCOPE**

The programme covers six (6) specialty areas, clinical aspects of nursing profession and research work.

**ENTRY REQUIREMENTS**

Candidates for Ph.D admission must satisfy the following condition:

* All candidates for Ph.D admission must have five credit passes in English, Mathematics, Chemistry, Physics and Biology at O’Level
* Candidates with Bachelors degree in nursing from a recognized University must obtain a minimum of Second Class Lower Division with a CGPA of not less than 3.0 on a 5 point scale or its equivalent.
* Graduates of the University of Nigeria or of other recognized Universities who have obtained the degree of Masters in Nursing, with a minimum of 4.00 Grade Point Average on 5 point scale provided that satisfactory research work formed part of the degree programme. The dissertation score should not be lower than 60% (B).
* Candidates must demonstrate adequate intellectual capacity, maturity and effective decision making and problem solving potentials.

**Mode of Study**

Doctoral candidates may be required to register or audit any of the M.Sc. courses on the recommendation and approval of the Departmental Postgraduate Studies Committee. In addition all Ph.D candidates should register the courses listed for them in the programme structure.

The Ph.D degree programme will be both by course work with written examinations and comprehensive research in area of specialty to be embodied in a thesis that involves oral defence and requires the participation of an external examiner.

The degree has a minimum of 30 units of which 12 units are for the thesis, 12 units for the course work and 6 units for doctoral seminars. Each candidate shall present seminar(s) meant to sharpen the student’s focus of the research.

**Duration of Study**

Full-Time 4 semesters (2 Calendar years) Minimum

10 semesters (5 Calendar years) Maximum

Part-Time 6 semesters (3 Calendar years) Minimum

14 semesters (7 Calendar years) Maximum

For all postgraduate coursework, the minimum pass score shall be 50% (C); continuous assessment shall constitute 30% of the examination for each course; any student who fails in any course, shall repeat such a course; any student whose CGPA falls below 2.50 in any semester shall withdraw from the programme.

**Stress Areas Stress No.**

Advanced concepts of professional Nursing 0

Medical –Surgical Nursing 1

Community Health Nursing 2

Nursing Administration and Management 3

Maternal and Child Health Nursing 4

Mental Health and Psychiatric Nursing 5

Nursing Education 6

Professional posting 7

Dissertation 8

**Scoring and Grading**

Scoring and grading of courses shall follow the guideline in which the percentage scores are interpreted in letter grade (A – F) and grade points (0 – 5) as displayed in the table below:

**Grading System for Postgraduate Programmes**

|  |  |  |
| --- | --- | --- |
| Percentage Score | Letter Grade | Grade Points |
| 70 – 100 | A | 5 |
| 60 – 69 | B | 4 |
| 50 – 59 | C | 3 |
| 0 – 49 | F | 0 |

The minimum pass mark for any course work is 50%; 30% shall constitute continuous assessment and 70% shall be from examination score. Candidates are required to re-register any failed course.

**Award of Degrees**

The degree of PhD in Nursing is awarded only to candidates who have passed all prescribed courses, seminars and other conditions prescribed by the postgraduate school. There is no GPA passing grade for Ph.D. The Ph.D thesis is on Pass or Fail basis. The minimum pass mark is 60% (B) Candidate must satisfy every other condition and keep all the rules and regulations required of all postgraduate students of the University of Nigeria as indicated in the PG brochure of the University.

**Employment Opportunities**

The postgraduate programme in nursing is designed to equip graduates for careers in clinical services, administration and management, education and research at all levels of health care and educational institutions, as well as corporate organizations and other relevant agencies.

**PROGRAMME STRUCTURE**

CORE COURSES:

C**OURSE NO TITLE Units**

PGC 701 Synopsis and Grant Writing 3

NSC 904 Advanced Nursing informatics 3

NSC 932 Advanced Nursing Entrepreneurship 2

NSC 981 Advanced Statistics in Health Technology 3

NSC 982 Advanced Research Methods and Techniques Applied to Nursing 3 ***TOTAL*** 13 Units

Units

NSC 984 Doctoral Seminar I 3

NSC 985 Doctoral Seminar II 3

NSC 986 Doctoral Seminar III 4

NSC 990 Doctoral Thesis 12

***TOTAL*** 22 Units

**COURSE DESCRIPTION**

**PGC 701 SYNOPSIS AND GRANT WRITING** (3 Units)

Identification of types and nature of grants and grant writing: mining of grants application calls on the internet. Determining appropriate strategy for each grant application. Study of various grant application structures and contents and writing of concept notes, detailed project description, budgeting and budget defense. Study of sample grant writings in various forms and writing of mock research and other grants. Identification of University of Nigeria synopsis structure and requirements (Introduction, Methodology and Results). Determining the content of each sub-unit of the synopsis. Steps in writing the synopsis from the Dissertation/Thesis document. Structural and Language issues. Common errors in synopsis writing and strategies for avoiding them. The roles of the students and supervisor in the production of a synopsis. Writing of mock synopsis. All registered Ph.D students must attend a solution-based interactive workshop to be organized by the School of Postgraduate Studies for a practical demonstration and application of the knowledge acquired from the course, conducted by selected experts.

**NSC 904** **ADVANCED** **NURSING INFORMATICS** (3 Units)

Concept of nursing informatics, Foundations of Nursing Informatics, Nursing use of information system, Nursing aspect of Health Information System, Applications of Nursing information to Clinical and Administrative practices. Education and research applications. Infrastructure Elements of the Informatics Environment, Professional Nursing informatics. Computer applications in health/nursing, data processing, storage, programming. Problems and prospects of use of computer in health sciences. Practicum; Development of a software.

**NSC 932 ADVANCED NURSING ENTREPRENEURSHIP** (2 Units)

History of entrepreneurship, basic concepts of nursing entrepreneurship; role of nursing entrepreneurship in personal and national growth and development; entrepreneurship power skill, characteristics of a nurse entrepreneur; types of enterprise a nurse entrepreneur can establish, development of nursing enterprises; formation of NGOs; Resource mobilization. Marketing concept and orientation, products and price, business ownership, growth and succession planning, business plan, financial analysis and management, time and risk management.

**NSC 981 ADVANCED STATISTICS IN HEALTH TECHNOLOGY** (3 Units)

Techniques of study and measurement of health populations, Health data; Statistical techniques (Biostatistics) Application of quantitative and qualitative techniques to health care delivery and utilization.

**NSC 982 Advanced Research methods and Techniques**

**applied to nursing** (3 Units)

Focus is on complex research designs and analysis variables and research utilization. Emphasis is on techniques for control of variable, data collection, analysis, and interpretation of results; In-depth analysis of the interrelationship of theoretical frameworks, design, sample selection, development and validation of data collection instruments, data analysis techniques, and presentation of results. Ethical and legal issues of research with human subjects. Thesis writing leading to a successful defense before peers and lecturers.

**NSC 984** **DOCTORAL SEMINAR I**  (3 Units)

Detailed written presentation of the candidate’s PhD topic proposal; It includes introduction, the research problems, aims and objectives, study area, theoretical frame work, literature review and research methods.

**NSC 985** **DOCTORAL SEMINAR II** (3 Units)

A written presentation on issues, theories and current academic debate and status in the candidate’s area of specialization.

**NSC 986** **Doctoral Seminar III**  (4 Units)

A detailed written pre-thesis presentation of the results of the candidate’s Ph.D research.

**NSC 990** **Ph.D THESIS**  (12 Units)

Independent research on topic approved by student’s graduate committee. Its evaluation will be based on a proposal approved by the faculty and the final thesis report.