**COLLEGE OF MEDICINE**

**FACULTY OF MEDICAL SCIENCES**

**DEPARTMENT OF HUMAN PHYSIOLOGY**

**M.Sc AND Ph.D DEGREE PROGRAMMES**

**PHILOSOPHY**

To advance the frontiers of knowledge in human physiology to present it as a rejuvenated discipline, vast and varied, with full capacity to meet up with the societal needs in the fields of teaching, research, entrepreneurship and community service. To imbibe the principles of problem based learning, working from bench to bedside and encouraging collaborative research with the clinical sciences, all aimed at improving patient care.

The programme is intended to produce embryologists, and reproductive endocrinologists who are very important members of the artificial reproductive technology team. In addition we intend to produce heart-lung machine scientists who are indispensable in open heart surgery. Furthermore we shall train clinical measurement scientists for example in spirometry, electroencephalogram, electrocardiogram, and electromyogram who will work in the clinical measurement laboratories of teaching and other hospitals.

**OBJECTIVES:**

The post graduated programmes of the Department of Human Physiology are designed to avert

the perennial scarcity of physiology lecturers in Nigeria and the African continent. Upon

successful completion of the Programme, the student could competently teach every aspect of

physiology as well as originate and conduct meaningful and relevant research in

his chosen field of study.

Holders of a First class honours degree in Human Physiology may be admitted into the

Master’s/doctoral degree programme of the Department of Human Physiology, UNEC

**Entry Requirement**

* Candidates for admission into the Master’s degree programme of the Department of Human Physiology, UNEC, must hold a B.Sc. degree in Human Physiology, with CGPA of a least 2.50 on a 5-point scale. Medical graduates (holders of MBBS or BDS) must have passed Human Physiology at one sitting in the First MBBS/BDS Professional Examination to qualify for admission it the MSc programme in Human Physiology.
* Candidates for admission into the Ph.D programme of the Department of Human Physiology, UNEC , must hold an MSc. In Physiology with a CGPA of a least 4.0on a 5-point scale
* Candidates admitted into the Master’s/Doctoral degree programme of the Department of Human Physiology will only be allowed to proceed with the Ph.D programme on completion of the MSc coursework if the candidate attains a CGPA of 4.0 and above in the MSc. coursework.

**Duration of study**

The minimum and maximum durations for the MSc programme of the department of Human

Physiology are as follows:

* Full time: A minimum of 3 semesters (18 months)

A maximum of 5 semesters (2 years and 6 months)

* Part time: A minimum of 4 semesters (2 years)

A maximum of 6 semesters (3 years)

The duration for Master’s/doctoral studies in the Department of Human Physiology, UNEC, are as follows:

* Full time: A minimum of 8 semesters (4 years)

A maximum of 12 semesters (6 years)

* Part time: A minimum of 10 semesters (5 years)

A maximum of 14 semesters (7 years)

The duration for Doctoral programme (after MSc) in the department of Human Physiology, UNEC, are as follows:

* Full time: A minimum of 6 semesters (3 years)

A maximum of 10 semesters (5 years)

* Part time: A minimum of 8 semesters (4 years)

A maximum of 12 semesters (6 years)

The first semesters of either the Doctoral or the Master’s shall be devoted to course work and written examinations; the remaining semesters of the Doctoral programme shall be for research, preparation of thesis and oral examination, while the remaining semesters of the MSc. Programme shall be used for research, preparation of project report and oral examination.

Candidates for the MSc/Ph.D Programme must fall into the following categories

(i) First class honours bachelor degree in physiology from a recognized University.

(ii) Masters degree in a recognized University with a GPA above 3.5 in a 5 point scale in another related discipline.

(iii) Candidates with fellowship in a related field with at least two relevant publications.

**LIST OF SUPERVISORS**

Prof. U. S. B. Anyaehie

MBBS, MSc, Ph.D (Abia) Body Fluids and Blood

Dr. E. E. Iyare

BSc, MSc, Ph.D (Lagos) Endocrinology, Reproduction and

Developmental Programming

Dr. D. C. Nwachukwu

BSc, MSc, Ph.D (Lagos) Cardiovascular, Renal and

Neurophysiology

**POST GRADUATE PROGRAMME** **COURSE OUTLINE**

**MSc Programme**

**Course Codes Title Units**

***First Semester***

PYS 701: General Physiology 2

PYS 711 Excitable Tissues 2

PYS 721: Body fluids and blood 2

PYS 731: Cardiovascular Physiology 3

PYS 741: Respiratory Physiology 2

PYS 751: Renal Physiology 2

PYS 761: Autonomic Nervous System 2

***Second Semester***

PYS 771 Gastrointestinal Physiology 3

PGC 601 Research Methodology & Application

of ICT in Research 3

PYS 791: Endocrinology and Reproduction 3

PYS 801: Sensory Physiology 2

PYS 811: Motor Systems and Integrative

functions of the Central Nervous System 3

PYS 821: Laboratory Techniques in Physiology 3

***Third Semester***

PYS 831: Seminars/Research methodology 3

PYS 891: Research project 6

**Ph.D Programme**

**Course Codes**

***First Semester***

PYS 901 Special Topic for Literature Review

(General Area) 3

PYS 911 Special Topic for Literature Review

(General Area) 3

PGC 701 Synopsis and Grant Writing 3

***Second Semester***

PYS 931 Special Topic for Literature Review

(Candidate’s Area of Interest) 3

PYS 941 Special Topic for Literature Review

(Candidate’s Area of Interest) 3

PYS 951 Research Proposal 3

PYS 961 Research Results 3

PYS 991 Thesis Defense 12

PGC 701 Synopsis and Grant Writing 3

**COURSE CONTENTS**

PYS 701: **General Physiology (2 Units)**

Cell Structure and functions of its organelles. Cell cycle and its regulation. Transport across cell membrane. Other transport processes. Homeostasis and control systems.

PYS 711 **Excitable Tissues (2 Units)**

Structure and functions of a nerve. Membrane potentials. Synaptic and junctional transmission. Structure and functions of different types of muscles and theories on mechanism of muscle contraction. Muscle twitch and summation of twitches. Muscle performance and fatigue.

PYS 721: **Body Fluids and Blood (2 Units)**

Body fluid compartments and their measurement. Regulation of body fluid volumes Physiological variation in body fluid volumes. Blood: Normal Haematological values and their regulation. Physilogical regulation in Haematological values. Techniques for measuring Haematological values. Haemoglobin genotypes (normal and abnormal) determination and clinical importance. Blood viscosity, theory of blood flow (Poiseuille equation), erythrocyte deformability and its clinical importance. Plasma proteins and their importance. Leucocyte physiology and immunity.

PYS 731: **Cardiovascular Physiology (3 Units)**

Electrical activities of the heart and ECG. Mechanical properties of the heart. Hemodynamics of circulation, regional circulation, regulation of arterial blood Pressure and cardiovascular responses in normal and disease states. Haemorrhage and shock.

PYS 741 **Respiratory Physiology (2 Units)**

Mechanics of respiration, pulmonary ventilation, lung volumes and capacities. Gas laws and spirometry, diffusion of gases through the respiratory membrane, transport of oxygen and carbon dioxide, control of respiration. Exercise physiology, high altitude and deep sea diving.

PYS 751 **Renal Physiology (2 Units)**

Physilogic anatomy of the functional unit of the kidney (nephron). Glomerular ultra filtration, tubular reasbsorption and secretion. Process of micturition, renal regulation of acid-base balance. Renal disease, diuretics and their method of action and renal function tests.

PYS 761: **Autonomic Nervous System (2 Units)**

Organization of ANS, adrenergic transmission, Choinergic transmission, concept of dual innervations of organs. Control of ANS by hypothalamus.

PYS 771 **Gastrointestinal Tract (3 Units)**

Structure of GIT. Motility and secretions of the GIT and their regulation. Digestion and absorption. GI hormones and regulation of food intake.

PGC 601 **Research Methodology & Application of ICT in Research (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 the study area from African and Western perspectives. 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 different disciplines. Identification of research problems and development of research questions and or hypotheses. Detailed treatment of methods of collecting relevant research data and the format for presenting research results (from designing the table of contents to referencing, bibliography and appendix). Data analysis and result presentation in different disciplines using appropriate analytical tools. Methods of project/dissertation writing. Application of appropriate advanced ICT tools relevant in every discipline for data gathering, analysis and result presentation. Essentials os spreadsheets, Internet technology, and Internet search engines. All registered Masters 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.

PYS 791 **Endocrinology and Reproduction (3 Units)**

General principles of endocrinology, Mechanism of hormonal action, pituitary gland and its control by hypothalamus. Anterior and posterior pituitary hormones. Pineal gland-anatomy and development, neural and endocrine communications and pineal pathology. Thyroid and parathyroid glands. Adrenal gland (medulla and cortex). Endocrine functions of the panceas, placenta, testes and ovary.

Reproduction: Physiological aspect of testicular aspect of testicular function. Method for diagnosis of hypogonadism, cryp-torchidism, male infertility, male contraception. Ovarian morphology, hypothalamic-pituitary-Ovarian-genital axis. Ovarian tumours, ovarian dysfunction and treatment, menstrual cycle, female contraception.

PYS 801 **Sensory Physiology (2 Units)**

Organsization of the sensory systems. Sensory receptors and their properties. Experimental methods in sensory physiology. Vision-light and colour, physiology of retina, visual acuity and pathway, colour vision. Auditory system – Nature of sound and noise, structure of the ear, auditory pathways and higher centers. Physiology of smell and taste – olfactory system: olfactory receptors, threshold and adaptation. Theories of smell. Taste: Receptors, threshold, taste pathway and theories of taste.

PYS 811 **Motor Systems and Integrative Functions of the CNS (2 Units)**

Central Organization of the CNS. Spinal Cord, cutaneous, deep and visceral sensation. Motor function of the brain; pyramidal system, extra pyramidal system and cerebellum, reticular activating system; sleep and wakefulness. Electrical activity of the brain (EEG), limbic system, learning, memory and speech.

PYS 821 **Laboratory Techniques in Physiology (3 Units)**

Introduction to laboratory techniques. Basic design of experimental physiology. Systemic Physiology practicals.

PYS 831 **Seminars (3 Units)**

Written and power point presentation of current issues in physiology. Presentation of proposal and results for masters’ project.

PYS 891: **Research Project (6 Units)**

Write-up of independent research on topic approved by the supervisor and the departmental postgraduate committee that will be orally defended before a panel of examiners that will include an approved external examiner.

PYS 901 **Special Topics for Literature Review I (General Area) (3 Units)**

First in the series of literature reviews in any area of Physiology outside the candidate’s area of interest.

PYS 911 **Special Topics for Literature Review II (General Area) (3 Units)**

Second in the series of literature reviews in any area of Physiology outside the candidate’s area of interest.

PGC 701 **Synopsis and Grant Writing (3 Units)**

Identification of types and nature of grant 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 of 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 the 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 knowledge acquired from the course, conducted by selected experts.

PYS 931 **Special Topics for Literature Review III (Candidate’s Area) (3 Units)**

First in the series of literature reviews in the candidate’s area of interest.

PYS 941 **Special Topics for Literature Review I (Candidate’s Area) (3 Units)**

Second in the series of literature reviews in the candidate’s area of interest.

PYS 951 **Research Proposal (3 Units)**

Power point presentation of the proposed research that will include: topic, introduction, justification/statement of problem, aim and objectives and methodology.

PYS 961 **Research Results (3 Units)**

Power point presentation of the results of the research that will include: topic, introduction, justification/statement of problem, aim and objectives, methodology, results, discussion, conclusion and summary of findings.

PYS 991 **Thesis Defense (12 Units)**

Oral defense of the comprehensive write-up of the candidate’s independent research (on a topic approved by the supervisor, the departmental and Faculty postgraduate committees and the post graduate school) before a panel of examiners that will include an approved external examiner.