CURRICULUM FOR PHYSIOLOGY DEPARTMENT

SUMMARY OF COURSE DISTRIBUTIONS

100 LEVEL

First semester

Course code		**Status**	**Units**
BIO 101	General biology I	C	3
CHM 101	General chemistry	C	3
CHM 102	Practical chemistry	C	2
GST 101	Use of English and library	C	4
MTH 101	Elementary mathematics (Algebra and trigonometry)	R	3
CSC 101	Introduction to computer science	C	2
PHY101	General physics (mechanics)	R	3
PHY 102	General Physics II (Electricity and magnetism)	C	3
			23

Second semester		**Status**	**Units**
BIO 111	General Biology I	C	3
CHM 112	General Chemistry II	C	3
GST 111	Nigeria People and Culture	C	2
GST 112	History and Philosophy of Science	C	2
MTH 112	Elementary Mathematics II (Calculus)	R	3
PHY 103	General Physics (Laboratory)	C	2
PHY 111	General Physics (Heat and kinetic theory)	R	2
PHS 111	Introduction to Physiology	C	2
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200 level

First semester

Course code		**Status**	**Units**
ANA 201	General anatomy, gross anatomy of the upper and lower limbs	C	2
ANA 202	Histology and histochemistry	R	2
MBC 201	Introduction to biochemistry/Practicals	C	2
MBC 202	Organelle and membrane biochemistry	R	2
PHS 201	General Principles of Physiology, Blood and Body Fluid	C	2
PHS 202	Nerve Muscle and Autonomic Nervous System	C	2
PHS 203	Cardiovascular System	C	3
PHS 204	Respiratory Physiology	C	2
ENT 201	Entrepreneurship I	C	2
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Second semester **Status** **Units**

ANA211	Gross anatomy II (Thorax, abdomen, Pelvis and Perineum)	C	2
ANA 212	Genetics and General Embryology	C	2
MBC 211	Bioenergetics and Metabolism I	R	2
MBC 212	Bioenergetics and Metabolism II	C	2
MBC 213	Endocrine Biochemistry	C	2
PHS 211	Gastrointestinal Track Physiology	C	2
PHS 212	Nutrition and Metabolism	C	1
PHS 213	Renal Physiology	C	2
PHS 214	Endocrinology and Reproduction	C	3
GST 222	Peace and Conflict Resolution	C	2
ENT 211	Entrepreneurship II	C	2
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300 level

First semester

Course code		**Status**	**Units**
ANA 301	Gross Anatomy III (Head and Neck)	C	2
ANA 302	Neuroanatomy	C	2
MBC 301	Nutritional Biochemistry	C	2
MBC 303	Practical in Biochemistry	C	2
PHA 301	General Pharmacology	R	3
PHS 301	Neurophysiology I	C	3
PHS 302	Special senses	C	3
PHS 303	Skin and Body Temperature regulation	C	1
PHS 304	Research Methodology in Physiology	C	2
PHS 305	Laboratory teaching and instrumentation	C	3
			23

Second Semester		**Status**	**Units**
PHS 311	Student Industrial Work Experience Scheme	C	15

400 level

First semester		**Status**	**Unit**
PHS 401	Neuroendocrinology	C	4
PHS 402	Basic Computer Skills in Medical Sciences	R	2
PHS 403	Environmental Physiology and Metabolism	C	3
PHS 404	Biostatistics	C	4
PHS 405	Seminars	C	2
			15

Second semester		**Status**	**Unit**
PHS 411	Project, Oral Examination	C	6
PHS 412	Care of Laboratory Animals and Laboratory Equipment	C	3
PHS 413	Neurophysiology II	R	3
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Description and Content of Courses in Physiology

PHS 111 Introduction to Physiology – 2 units

Introduction and history of physiology; cells and organelles; Homeostasis and control system. Excitable cells and contractile tissue.

PHS 201 General Principles of Physiology, Blood and Body Fluid – 2 units

General characteristics and functions of blood. Properties and functions of plasma, red blood cells; factors involved in erythropoiesis, blood groups. White blood cells; origin, type, properties functions, antigenicity and immunities. Platelets and hemostatic mechanisms. Reticulo-endothelial system. Clotting and fibrinolytic systems. Immunity and Immunodeficiency disease and HIV. Compartmentalization and composition of body fluids, values measurement and electrolytes.

PHS 202 Nerve Muscle and Autonomic Nervous System – 2 units

Functional organization of Autonomic Nervous System, basic characteristics of sympathetic and parasympathetic divisions**.** Ion transport through nerve fibre membrane. Membrane potential, conductivity of nerve fibres, excitation and inhibition, neuromuscular transmission. Molecular basis of muscle contraction. Role of calcium ion in muscle contraction. Excitation contraction coupling, motor units, red and white muscles, muscle spindles. Isometric and isotonic contractions.

PHS 203 Cardiovascular System – 3 units

Overall plan and functions of the C.V.S. Physiologic anatomy of the heart, mechanical events of cardiac cycle, cardiac output and its estimation, E.C.G. The Vascular system; Cross sectional area of different vascular groups, systolic, diastolic, pulse and mean pressures, exchange of fluid across the capillaries, venous and central venous pressures. Integration of C.V.S functions; central control centers, regulation of systemic blood pressure. Cardio-vascular adaptations in health and disease. Circulation through special areas. Vascular endothelium in cardiovascular control.

PHS 204 Respiratory Physiology – 2 units

Physiologic anatomy of respiratory apparatus, Brief review of relevant gas laws. Lung volumes. Mechanics of breathing. Gas diffusion through alveoli, capillary membrane. Pulmonary circulation, Ventilation perfusion ratio. O2 and CO2 transport. Control of respiration, Hypoxias, O2 treatment, abnormal types of breathing. Altitude and depth acclimatization. Respiratory adjustments in health and disease. Aerospace physiology. Deep sea diving.

PHS 211 Gastrointestinal Track Physiology – 2 units

Physiologic anatomy of the gastrointestinal tract. Review of smooth muscle function. Secretions in the G.I.T. and their control. Movements of the gastrointestinal tract. Digestion and absorption of various food substances. Liver and its functions. Disorders of G.I.T. The Gut as an endocrine organ.

PHS 212 Nutrition and Metabolism – 1 unit

Types of nutrients, nutritive values, metabolism of carbohydrates and formation of ATP, lipid metabolism, protein metabolism energetics and metabolic rate.

PHY 213 Renal Physiology – 2 units

Physiologic anatomy of the kidney, renal circulation and auto-regulation. Glomerular filtration. Tubular transport. Urine formation: Counter-current system. Water volume and ionic regulation. Acid-base balance. Micturition. Abnormalities of renal function.

PHS 214 Endocrinology and Reproduction - 3 units

Endocrine system: Introduction and neuroendocrine relationship. Hypothalamo-Pituitary axis, Endocrine glands; normal, hypo – and hyper-functions. Other hormones of some clinical importance. Physiologic anatomy of male and female reproductive system. Male and female sex hormones. Cyclicity of hormone secretion in females. Physiology of contraception. Assisted fertility techniques.

PHS 301 Neurophysiology I – 3 units General design of the nervous system, major levels of the central nervous system, central nervous system synapses, sensory receptors, neuronal circuits for processing somatic sensation, Organization of the spinal cord for motor functions, muscle spindle and golgi tendon organs and their role in muscle control, flexor reflex and withdrawal reflexes, cross extensor reflex, reciprocal inhibition and reciprocal innervation, reflexes of posture and locomotion, spinal cord reflexes that cause muscle spasm, spinal cord transection and spinal shock. Motor cortex and corticospinal tract, extrapyramidal system, role of the brain stem in controlling motor function. Vestibular sensations and maintenance of equilibrium. Cerebellum and its motor functions, basal ganglia and its motor functions.

PHS 302 Special Senses – 3 units

The structure and optics of the eye. Accommodation and refractive errors, visual acuity, physiology of the retinal, adaptation of vision and visual pathways. The structure of the ear, transmission of sound, cochlea mechanism, auditory pathways, vestibular function, taste and olfactory receptor, taste and olfactory pathways and adaptation.

PHS 303 Skin and Body Temperature Regulation – 1 unit

Normal body temperature, heat balance, regulation of body temperature, abnormality in body temperature regulation.

PHS 304 Research Methodology in Physiology – 2 units

Experimentation techniques in physiology, research data collection and analysis, report writing, experimental designing, collection of literature, interpretation of research findings, research proposal and scarcity of funds for research projects.

PHS 305 Laboratory teaching and instrumentation – 3 units

Opportunity for students to review the Physiological concept of systems taught and understand them so thoroughly as to enable them demonstrate the concept using available equipment to Medical or more junior Physiology students.

PHS 311 Student Industrial Work Experience Scheme, SIWES – 15 units

The students undergo an Industrial Work/Attachment in different sections such as the Physiology Research Laboratories, Pharmaceutical Industries, Hospital Laboratories, and Beverage Industries ETC. At the end, the students' log books are assessed by their supervisors. The students will present to the Department their experiences during the SIWES posting, their challenges and solutions and possible any

innovation that they have been able to develop during the period. They are questioned and assessed by a departmental committee on SIWES.

PHS 401 Neuroendocrinology – 4 units

Historical origins of a Neuro-endocrine connection. A review of the physiologic anatomy of hypothalamo-pituitary link. Current concepts of channels of communication between the hypothalamus and the pituitary. Hypothalamic neurosecretions. The "master gland" of the endocrine system. Pituitary secretions and their current concepts of the servomechanisms between the hypothalamus, the pituitary and other endocrine organs.

PHS 402 Basic Computer Skills in Medical Sciences – 2 units

Knowledge of the concept of soft wares, import and export of data, use of some selected statistics/mathematical packages as well as applications related to the practical of some physiological experiments and procedures.

PHS 403 Environmental Physiology and Metabolism – 3 units

Current concepts on the control of energy balance. Brief review of intermediary Metabolism of specific organs: brain, renal, pulmonary and cardiac metabolism. Abnormal metabolism: Diabetes mellitus, specific in-born errors of metabolism.126 Physiological basis of topical environmental problems, Family Planning, malnutrition.

PHS 404 Biostatistics – 4 units

Orientation to statistics, definition and examples of basic statistical terminology. Descriptive statistics: Tabular and Graphical presentations. Populations, samples and the Normal distribution. Design of experiments. Introduction to Demography in Medicine. Procedures for Hypothesis Testing. Analysis of variance. Correlation and Regression. Chi-square. Nonparametric Techniques, Relative Risk and Measures of strength of Association. Computers: An overview

PHS 405 Seminars – 2 units

PHS 411 Project, Oral Examination – 6 units

The students will be given a supervised research project. He/she is expected to use the knowledge acquired in research methodology, biostatistics and other courses in physiology to write a project in 5 chapters using the following headings: introduction, literature review, methodology, result and discussion, recommendation and conclusion.

PHS 412 Care of Laboratory Animals and Laboratory Equipment – 3 units

Introduction to animal husbandry, nutrition and health, types of laboratory animals and specific management practices for each type, restraining of animals, principles and functions of management, personnel management, staff/management relationship, stock control, record keepings, selection and storage of chemicals, materials and apparatus, laboratory hazards and safety measures in laboratories, handling of radioactive waste, emergency treatment for accidents.

PHS 413 Neurophysiology II – 3 units

Pathophysiology of pain. Cerebral cortex, intellectual functions of the brain, learning and memory. The limbic system and hypothalamus.