

UNIVERSITY OF NIGERIA

ENUGU CAMPUS

FACULTY OF BASIC MEDICAL SCIENCES

DEPARTMENT OF ANATOMY

**REVISED POSTGRADUATE DEGREE PROGRAMMES IN HUMAN ANATOMY
(M.Sc AND Ph.D)**

2015

MASTER OF SCIENCE (M.Sc.) AND DOCTOR OF PHILOSOPHY (PhD) DEGREE PROGRAMME IN HUMAN ANATOMY

BRIEF HISTORY OF THE DEPARTMENT

The Department of Anatomy, Faculty of Medical Sciences University of Nigeria was established in 1967. Currently, the department offers undergraduate courses leading to the B.Sc, Second MBBS and second BDS professional degree programs of the Faculties of Medical and Dental Sciences, and also courses for the students of the Faculty of Health Sciences for their various degree programs. At the postgraduate level it also offers courses leading to the award of Master of Science (M.Sc.) and Doctor of Philosophy (Ph.D) degrees.

Philosophy

The philosophy is to develop highly skilled manpower for teaching, research and professional services for the public, private and international organizations in the field of Basic Medical and Health Sciences.

Aims and Objectives

- (a) To Provide graduates of the program with the necessary competencies and skills to function effectively as teachers, researchers and professionals in the health and medically related industry. This is will be through provision of scientific knowledge and skills required to enhance their performance as members of the health care team in their specialties and disciplines.
- (b) Acquisition of teaching, research and professional skills for imparting knowledge and service delivery in Nigeria and internationally.
- (c) To produce graduates who are capable of applying scientific knowledge and principles to solve human and environmental problems
- (d) To produce scientists who are socially responsible and mindful of accepted norms and ethics

MSC Admission Requirements

An applicant to the programme of M.Sc Human Anatomy shall possess a Bachelor of Human Anatomy, Bachelor of Medicine and Surgery, Bachelor of Physiotherapy and Bachelor of Dental surgery. Candidate may also possess a good degree in Zoology with specialization in primate biology.

PHD Admission Requirements

Masters degree in Human Anatomy with a minimum CGPA of 4.0 (60%)

Successful conversion from M Phil PhD programme

MSC Duration of the programme

Full time Masters' programme in Human Anatomy shall run for a minimum duration of three (3) semesters

Part-time Masters' programme in Human Anatomy shall run for a minimum duration of five (5) semesters and a maximum of eight (8) semesters.

PHD Duration of Programmes

The Full time Doctor of Philosophy Degree Programme shall run for a minimum duration of six (6) semesters and maximum of 12 (semesters).

The Part time Doctor of Philosophy Degree Programme shall run for a minimum duration of ten (10) semesters and maximum of sixteen (16) semesters.

Mode of Study

MSC: The programme consists of course work, practical, seminar and dissertation.

PHD: The programme consists mainly of project work, seminars and minimal course work.

Requirements for graduation

To be awarded the Masters of Science degree in Human Anatomy, a candidate must register for a minimum of 30 units which must include project (6 units) and some elective/required courses.

Areas of specialization.

These should include:

- 1) Gross anatomy,
- 2) Neuroanatomy,
- 3) Histology"
- 4} Embryology,
- 5) Reproductive technologies,
- 6) Anatomical Science Education
- 7). Forensic Biology

8). Cell Biology

9). Biological Anthropology

STRESS AREAS

Foundational Courses	0
Embryology	1
Histology	2
Histochemistry & Laboratory	3
Clinical/Applied Anatomy	4
Molecular Biology	5
Research Methods	6
Seminar	7
Research Project	9

FIRST SEMESTER

COURSE CODE	COURSE TITLE	Units
ANA 711	Developmental anatomy and Teratology	3
ANA 721	Histology and Histochemistry	3
ANA 731	Practice of histological techniques	3
PGC 601	Research Methodology and ICT	3
ANA 701	Laboratory techniques and Regional dissection	4
ANA 705	Comparative Anatomy	3
ANA 733	Electron Microscopic Techniques	3
ANA 703	Seminars	2
Total		24

SECOND SEMESTER

COURSE CODE	COURSE TITLE	
	Units	
ANA 702	Topographical anatomy with clinical anatomy	3
ANA 712	Human Genetics	3
ANA 704	Advanced Neuroanatomy	3
ANA 706	Radiological and functional anatomy	3
ANA 712	Reproductive biotechnology	3
ANA 752	Molecular embryology and genetic engineering	3
ANA 708	Anthropology	3
ANA 754	Animal Breeding Biotechnology	3
Total		24

THIRD SEMESTER

COURSE CODE	COURSE TITLE	Units
ANA 801	Laboratory Techniques & Regional dissection	3
ANA 843	Forensic biology	3
ANA 893	Dissertation	6
ANA 873	Seminar	1
Total		13

COURSE DESCRIPTION

ANA 701 Laboratory Techniques & Regional Dissection 4 units

Four (4) hours of practical per week for dissection through supervision of undergraduate dissection or dissection by postgraduate students

ANA 702 Topographical Anatomy with Clinical Anatomy 3 units

Introduction to clinical applied anatomy. General principles of topographical anatomy using examples that are representative of all the regional anatomy. Relevant examples are necessary. The regions and examples include: upper limb: brachial plexus, cubital fossa, ulnar bursitis etc.

Lower Limb: femoral triangle, Hemias, Femoral fracture, popliteal fossa etc.

Thorax: Thoracotomies, fracturedribs etc.

Abdomen: Laparatomy, Hernias, rectal surgeries and obstetric anatomy etc.

Regional Physical examination: respiratory, cardiovascular, gastro-intestinal, reproductive and neurological systems etc

ANA 703 Seminars.

ANA 704 Advanced Neuroanatomy 3 units

Chemoarchitectonics, Neural growth factors, Neuromodulators, Paraneurology, Diffuse neuroendocrine system, Neuroendocrinology, Introduction to Neuropharmacology, Neuroanesthesiology, Experimental neurosurgery, Comparative vertebrate neuroanatomy, Neurohistochemistry, Neuroimmunohistochemistry, peroxidases etc, Coronal sections of Gross Brain, Prosencephalisation in human brain

ANA 705 Comparative Anatomy

3 units

Animal Kingdom, Invertebrates I, Invertebrates II, Invertebrates III, Fishes, Amphibians, Reptiles, Birds, Mammalogy, Vertebrate taxonomy, Development of bipedalism, locomotor apparatus, Development of amniota, Comparative neuroanatomy of brain, Placentation, Speech and phonation, Skull, Evolutionary theory, Comparative anatomy of vertebrate muscular system, Comparative anatomy of vertebrate skeletal system, Comparative anatomy of vertebrate gastrointestinal system, Comparative anatomy of vertebrate cardiovascular system, Comparative anatomy of vertebrate respiratory system, Comparative anatomy of vertebrate urinary system, Comparative anatomy of vertebrate reproductive system

ANA 706 Radiological and Functional Anatomy

3 units

Introduction to radiobiology, Radiation physics & genetics, Imaging modalities in anatomy- X-ray, fluoroscopy, thermography, xerography, historadiology, mammography, ultrasonography, tomography, and CAT scan, [MR, PET, Introduction to Radiology & Radiography, Positions for radiological imaging, Normal flat X-ray plates, Contrast studies in radiological imaging, Ultrasounds in imaging anatomy, CAT scan in imaging anatomy, NMR and PET in imaging anatomy, Osseous developmental radiology, Radiological anthropometry peroxidases etc

ANA 708 Anthropology

3 units

What is anthropology? Evolution & Anthropology, Physical characteristics in man, Genetics of populations, Hominoids, Hominids, Hominins, Modern man, Paleo anthropology, Anthropometry, Human Races, Social anthropology, Cultural anthropology, Religious anthropology, Medical anthropology, Clinical anthropology, Advanced evolution of man, Advanced and practical clinical anthropology.

ANA 711 Developmental Anatomy & Teratology 3 units

Review of General and systemic embryology, Experimental embryology, totipotency and developmental potential, embryo manipulations, early pregnancy science, progesterone and progestagens, progesterone deficiency syndromes, pattern formation, positional informatics, primitive streak. French flag problem; growth and differentiation, embryonal/homeobox genes, embryonal growth factors, oncogenes, morphogenesis, histogenesis and histodifferentiation. Principle of Teratogenesis, experimental teratogenesis and mechanism of teratogenesis, All or none rule, drugs and' first, second and third trimesters of pregnancy. Common terata, congenital anomalies, biological contraception and contragestion, early pregnancy endocrinology and immunology, reproductive biotechnology, regional and systemic anatomy of agamid lizard and human embryo compared, congenital Niigata-Minamata disease.

ANA 712 Human Genetics 3 units

Introduction, Molecular basis of genetics/gene, Mendelism, Inheritance patterns in Mendelian heredity, Multifactorial inheritance, Biochemical genetics, Crossing-over/linkage/meiosis, Chromosome studies/ mapping, Mutation and Mutagenesis, DNA repair, Genetic diseases and treatment, Genetic counseling, .Developmental genetics, Pharmacogenetics/ Pharmacogenomics, Pharmacogenetics. Radiation genetics, Transplantation genetics, Blood group genetics, Population genetics, Dermatoglyphics & genetics.

ANA 714 Reproductive Biotechnology 3 units

Introduction to assisted reproductive technologies, history of assisted reproductive technologies, sperm technologies, oocyte technologies, in vitro fertilization, environment of early embryo: oviduct; Oviductal technologies, intracytoplasmic sperm injection, xenogenous egg incubation, cloning; estrous cycle.

ANA 721 Histology and Histochemistry 3 units

Cellular organelles I Cellular organelles II, Cellular biophysics, Cellular endocrinology, Ultrastructure of developing cells, Ultrastructure of Reproductive cells, Ultrastructure of Renal cells, Ultrastructure of Respiratory cells, Ultrastructure of Cardiovascular cells,

Ultrastructure of Muscular cells, Ultrastructure of the Neuron, Electron micrography & Stereo logy. Introduction to Histochemistry, Histochemical tissue processing, Cryotomy, Histochemistry of carbohydrates, Histochemistry of Proteins & Lipids, Histochemistry of Nucleic acids, Histochemistry of Pigments/minerals, Enzyme histochemistry, Quantitative Histochemistry, Cytochemistry, Electron cytochemistry, Diagnostic histochemistry, Immunohistochemistry, APUD, Clinical cytochemistry, APUDOMAS, Brain-gut peptides, Biogenic amines, In situ hybridisation histochemistry, Cell membrane concepts,

ANA 731 Practice of Histological Techniques 3 units

Origin of Histology, Review of tissue processing, Fixation, Histological tissue processing, Staining procedures/theory, Optical microscopy, Introduction to microscopy, Types of optical microscopes, Electronicvisualisation of DNA hybrids.

ANA 733 Electronic Microscopic Techniques 3 units

Introduction to Electron microscopy, Principles of Electron microscopy, Electron microscopic tissue processing, Ultramicrotomy, Staining procedures-in EM, Scanning EM, Transmission EM, Heteroduplex mapping, EM photography

ANA 754 Animal Breeding Biotechnology 3 units

Technique of animal breeding. Why animal breeding? Oestrous cycle; pseudopregnancy, rabbit xenogenous incubation; cloning, embryo splicing, chimaera formation, zoological care of wildlife; animal husbandry; egg transplantation, artificial insemination, oocyte recovery

PGC 601 Research Methodology and ICT 3 units

Research initiation, organization, and execution. Research writing and presentation, seminars, conference papers, articles. symposia, thesis, Grants etc. Principles and applications of statistical methods in biomedical investigations including:

Normal distribution, Analysis of data histograms, graphs, Pi graphs etc. Test for significance, t test, paired & unpaired analysis of variance, scattergrams and regression analysis Anatomical informatics as part of Health Sciences informatics. Anatomical informatics as a part of bioinformatics. Introduction to computers and medical informatics,

Keyboarding skills, Hardware, Software, Operating system 1, Viruses and computer security, Word Processing, . Spreadsheet 1, Internet 1, Electronic mail 1, Literature search. The use of internet and other computer facilities to study human anatomy. Electronic learning facilities in anatomy; Electronic Anatomy.

ANA 861 Forensic Biology

3 units

Forensic biology: A sub-discipline of forensic science, Sources of DNA evidence, Crime scene investigation and Laboratory Analysis of Biological Evidence, Serology concepts, Identification of semen, blood, saliva and other body fluids. Blood group typing and protein profiling. Introduction to human nuclear and mitochondrial genome. DNA: sequencing, amplification by PCR, Quantitation, and electrophoresis

ANA 851 Molecular Embryology & Genetic Engineering

3 units

Introduction to molecular biology, molecular embryology, gene injection, oncogenes, homeobox genes; DNA structure, gene, reverse transcriptase enzyme, retrovirology, other enzymes in molecular biology, DNA polymorphism, DNA sequencing, Southern blot, Northern blot, Western blot, polymerase chain reaction technology, gene cloning, cloning-to-clinic; recombinant DNA products, genomics, proteomics, Electron microscopy of DNA; Translational medicine.

ANA 873 Seminars

1 units

Recombinant DNA Technology, Molecular Embryology, Transgenics, In situ hybridisation, Ultracytochemistry, Cryotomy, Cryobiology, Evolutionary theory, Dermatoglyphics, Memory, Limbic system, Gene therapy, HLA studies, In vitro fertilisation, Estrous cycle, Macrophagic system, Embryonal growth factors, Gynecological endocrinology, Pseudopregnancy, Signal transduction, Chronobiology, Clinical anthropology, Stereology, Gastrointestinal hormones, Embryonic manipulations, Cellular immunology.

ANA 893 Dissertation

6 units

Research project in the candidates area of interest presented in a report (Dissertation) and examined orally before a panel of examiners.

COURSES FOR THE DOCTOR OF PHILOSOPHY DEGREE IN HUMAN ANATOMY

Candidates shall take minimum of four elective courses..

COURSE CODE	COURSE TITLE	Units
CORE COURSES		
PGC701	Research grant writing and synopsis writing	3
ANA 972	Seminar	1
ANA 992	Dissertation	12
ELECTIVE COURSES		
ANA 911	Developmental anatomy and Teratology	2
ANA 932	Histochemistry	2
ANA 962	Biostatistics	2
ANA 952	Human Genetics	2
ANA 904	Advanced Neuroanatomy	2
ANA 906	Radiological and functional anatomy	2
ANA 912	Reproductive biotechnology	2
ANA 951	Molecular embryology and genetic engineering	2
ANA 941	Anthropology	2
ANA 943	Forensic biology	2
ANA 931	Electron Microscopic Techniques/	2
ANA 945	Animal Breeding Biotechnology	2
ANA 902	Comparative Anatomy	2

COURSE DESCRIPTION

ANA 904 Advanced Neuroanatomy . 2 units

Chemoarchitectonics, Neural growth factors, Neuromodulators, Paraneurology, Diffuse neuroendocrine system, Neuroendocrinology, Introduction to Neuropharmacology, Neuroanesthesiology"Experimentalneurosurgery, Comparative vertebrate neuroanatomy, Neurohistochemistry, Neuroimmunohistochemistry, peroxidases etc, Coronal sections of Gross Brain, Prosencephalisation in human brain

ANA 906 Radiological and Functional Anatomy 2 units

Introduction to radiobiology, Radiation physics & genetics, Imaging modalities in anatomy- X-ray, fluoroscopy, thermography, xerography, historadiology, mammography, ultrasonography, tomography, and CAT scan, [MR, PET, Introduction to Radiology & Radiography, Positions for radiological imaging, Normal flat X-ray plates, Contrast studies in radiological imaging, Ultrasounds in imaging anatomy, CAT scan in imaging anatomy, NMR and PET in imaging anatomy, Osseous developmental radiology, Radiological anthroposteorometry peroxidases etc

ANA 911 Developmental Anatomy & Teratology 2 units

Review of General and systemic embryology, Experimental embryology, totipotency and developmental potential, embryo manipulations, early pregnancy science, progesterone and progestagens,progesterone deficiency syndromes, pattern formation, positional informatics, primitive streak. French flag problem; growth and differentiation, embryonal/homeobox genes, embryonal growth factors, oncogenes, morphogenesis, histogenesis and histodifferentiation. Principle of Teratogenesis, experimental teratogenesis and mechanism of teratogenesis, All or none rule, drugs and' first, second and third trimesters of pregnancy. Common terata, congenital anomalies, biological contraception and contragestion, early pregnancy endocrinology and immunology, reproductive biotechnology, regional and systemic anatomy of agamid lizard and human embryo compared, congenital Niigata-Minamata disease.

ANA 902 Comparative Anatomy

2 units

Animal Kingdom, Invertebrates I, Invertebrates II, Invertebrates III, Fishes, Amphibians, Reptiles, Birds, Mammalogy, Vertebrate taxonomy, Development of bipedalism/locomotor apparatus, Development of amniota, Comparative neuroanatomy of brain, Placentation, Speech and phonation, Skull, Evolutionary theory, Comparative anatomy of vertebrate muscular system, Comparative anatomy of vertebrate skeletal system, Comparative anatomy of vertebrate gastrointestinal system, Comparative anatomy of vertebrate cardiovascular system, Comparative anatomy of vertebrate respiratory system, Comparative anatomy of vertebrate urinary system, Comparative anatomy of vertebrate reproductive system.

ANA 931 Electronic Microscopic Techniques

2 units

Introduction to Electron microscopy, Principles of Electron microscopy, Electron microscopic tissue processing, Ultramicrotomy, Staining procedures-in EM, Scanning EM, Transmission EM, Heteroduplex mapping, EM photography

ANA 941 Anthropology

2 units

What is anthropology? Evolution & Anthropology, Physical characteristics in man, Genetics of populations, Hominoids, Hominids, Hominins, Modern man, Paleo anthropology, Anthropometry, Human Races, Social anthropology, Cultural anthropology, Religious anthropology, Medical anthropology, Clinical anthropology, Advanced evolution of man, Advanced and practical clinical anthropology.

ANA 943 Forensic biology

Forensic biology: A sub-discipline of forensic science, Sources of DNA evidence, Crime scene investigation and Laboratory Analysis of Biological Evidence, Serology concepts, Identification of semen, blood, saliva and other body fluids. Blood group typing and protein profiling. Introduction to human nuclear and mitochondrial genome. DNA: sequencing, amplification by PCR, Quantitation, and electrophoresis

ANA 945 Animal Breeding Biotechnology

2 units

Technique of animal breeding. Why animal breeding? Oestrous cycle; pseudopregnancy, rabbit xenogenous incubation; cloning, embryo splicing, chimaera formation, zoological care of wildlife; animal husbandry; egg transplantation, artificial insemination, oocyte recovery

ANA 951 Molecular Embryology & Genetic Engineering

2 units

Introduction to molecular biology, molecular embryology, gene injection, oncogenes, homeobox genes; DNA structure, gene, reverse transcriptase enzyme, retrovirology, other enzymes in molecular biology, DNA polymorphism, DNA sequencing, Southern blot, Northern blot, Western blot, polymerase chain reaction technology, gene cloning, cloning-to-clinic; recombinant DNA products, genomics, proteomics, Electron microscopy of DNA; Translational medicine.

ANA 972 Seminars

1 units

Recombinant DNA Technology, Molecular Embryology, Transgenics, In situ hybridisation, Ultraimmunocytochemistry, Cryotomy, Cryobiology, Evolutionary theory, Dermatoglyphics, Memory, Limbic system, Gene therapy, HL-A studies, In vitro fertilisation, Estrous cycle, Macrophagic system, Embryonal growth factors, Gynecological endocrinology, Pseudopregnancy, Signal transduction, Chronobiology, Clinical anthropology, Stereology, Gastrointestinal hormones, Embryonic manipulations, Cellular immunology.

ANA 992 Dissertation

12 units

Research project in the candidates area of interest presented in a report (Dissertation) and examined orally before a panel of examiners.