Program and Course Structure

School of Medical Science and Research

MSc (Medical Anatomy)
Session:2024-25
Program Code: SMS0302

1. Standard Structure of the Program at University Level

1.1 Vision, Mission and Core Values of the University

Vision of the University

To serve the society by being a global University of higher learning in pursuit of academic excellence, innovation and nurturing entrepreneurship.

Mission of the University

1. Transformative educational experience
2. Enrichment by educational initiatives that encourage global outlook
3. Develop research, support disruptive innovations and accelerate entrepreneurship
4. Seeking beyond boundaries

Core Values

- Integrity
- Leadership
- Diversity
- Community

1.2 Vision and Mission of the School

Vision of the School

To serve the society by being a premier institute that promotes a comprehensive approach to human health through excellence inacademics, research and clinical care

Mission of the School

- Provide a transformative educational experience in Medical Science
- Develop skills and competencies to create global leaders in clinical care
- Promote innovative and collaborative research through intellectual and technological advancement
- Establish a center for excellence in preventive, promotive and curative health care

Core Values

- Integrity
- Leadership
- Ethics
- Community Health

1.3 Program Educational Objectives (PEO)

1.3.1 Program Educational Objectives (PEO)

A post graduate student having qualified the MSc (Anatomy) examination should:

PEO1. Acquire comprehensive knowledge of structure and functions of human body, ontogeny of human development and genetic mechanisms involved in normal and abnormal development, knowledge of light microscopic and ultrastructure of human body. Knowledge of structure and functional correlation of nervous system and be able to communicate the same clearly and with precision.
PEO2. Be aware of contemporary advances and developments in the field of Anatomy.
PEO3. Acquire knowledge of modern research techniques and be familiar with the recent advances in human biology Inculcate habit of scientific enquiry and be able to identify lacunae in the existing knowledge in a given area.
PEO4. Have acquired skills in educating medical and paramedical professionals.
PEO5. Have acquired skills in effectively communicating with the students and colleagues from various medical and paramedical fields.
PEO6. Have acquired skills of integrating anatomy with other disciplines as and when needed.
PEO7. Have acquired qualities of a good teacher capable of innovations in teaching methodology.
PEO8. Have been able to demonstrate adequate management skills to function as an effective leader of the team engaged in teaching and research.

1.3.2 Mapping PEOs with Mission Statements:

PEO Statements	**School Mission 1**	**School Mission 2**	**School Mission 3**	**School Mission 4**
PEO1. Acquire comprehensive knowledge of structure and functions of human body, ontogeny of human development and genetic mechanisms involved in normal and abnormal development,	**3**	**-**	**2**	**2**

knowledge of light microscopic and ultrastructure of human body. Knowledge of structure and functional correlation of nervous system and be able to communicate the same clearly and with precision.				
PEO2. Be aware of contemporary advances and developments in the field of Anatomy.	**3**	**-**	**3**	**2**
PEO3. Acquire knowledge of modern research techniques and be familiar with the recent advances in human biology ;Inculcate habit of scientific enquiry and be able to identify lacunae in the existing knowledge in a given area.	**3**	**1**	**3**	**3**
PEO4. Have acquired skills in educating medical and paramedical professionals.	**3**	**2**	**-**	**3**
PEO5. Have acquired skills in effectively communicating with the students and colleagues from various medical and paramedical fields.	**-**	**2**	**-**	**-**
PEO6. Have acquired skills of integrating anatomy with other disciplines as and when needed.	**3**	**1**	**-**	**1**
PEO7. Have acquired qualities of a good teacher capable of innovations in teaching methodology.	**3**	**2**	**2**	**3**

PEO8. Have been able to demonstrate adequate management skills to function as an effective leader of the team engaged in teaching and research.	**3**	**-**	**3**	**1**

1.3.3 Program Outcomes (PO's)

A. Cognitive Domain

A post graduate student having qualified the MSc (Medical Anatomy) examination should be able to

PO1. Acquire competencies in gross and surface anatomy, neuroanatomy, embryology, genetics, histology, radiological anatomy, applied aspects and recent advances of these branches of anatomy to clinical practice.

PO2. Demonstrate the ability to apply the knowledge of anatomy and discuss information relevant to the problem,

PO3. Demonstrate the ability to correlate the clinical conditions to the anatomical/ embryological/hereditary factors.

PO4. Demonstrate the ability to evaluate scientific/clinical information and critically analyze conflicting data and hypothesis

PO5. Acquire skills in teaching, research methodology, epidemiology & basic information technology.

PO6. Participate actively in various workshops/seminars/journal clubs/demonstration in the allied departments, to acquire various skills for collaborative research.

B Affective domain

A post graduate student having qualified the MSc (Medical Anatomy) examination should be able to

PO7. Demonstrate self-awareness and personal development in routine conduct. (Self-awareness)

PO8. Communicate effectively with peers, students and teachers in various teaching-learning activities. (Communication)

PO9. Demonstrate

a. Due respect in handling human body parts & cadavers during dissection (Ethics & Professionalism)
b. Humane touch while demonstrating living surface marking in subject/patient (Ethics & Professionalism)

C Psychomotor Domain

PO10. Acquire mastery in dissection skills, embalming, tissue preparation, staining and museum preparation.

PO11. Has ability to use computer applications Microsoft office (Microsoft word, excel, power point), Internet, Searching scientific databases (e.g. PubMed, Medline, Cochrane reviews).

PO12. Acquire skills in paper & poster preparation, writing research papers and Thesis.

1.3.4 Mapping of Program Outcome Vs Program Educational Objectives

	PEO1	PEO2	PEO3	PEO4	PEO5	PEO6	PEO7	PEO8
PO1	3	3	-	-	-	3	-	-
PO2	3	3	3	-	-	3	-	-
PO3	3	3	3	-	-	3	-	-
PO4	-	3	3	-	-	2	-	3
PO5	1	3	3	1	3	3	2	3
PO6	-	-	3	-	3	3	-	3
PO7	-	-	-	1	2	-	3	3
PO8	-	-	-	2	2	-	3	3
PO9	-	-	-	2	2	-	3	3
PO10	3	3	3	3	-	-	2	2
PO11	-	-	3	2	-	-	3	3
PO12	-	-	3	1	3	-	1	3

School: SMSR		**Batch: 2019-20**
Program: MSc Medical Anatomy		**Current Academic Year: 2019-20**
1	Programme Code	SMS0302

Syllabus

The course is divided into six sections. The section- wise details of the course is as follows:

SECTION – 1

GROSS ANATOMY

Course content:

Osteology, arthrology, muscle & fascia, skin, nervous tissue, principles governing arterial, venous and lymphatic drainage, detailed gross anatomy of the human body including sectional

anatomy and evolution, functional and applied anatomy, principles involved in plain radiography, special investigative procedures and newer imaging techniques and living anatomy.

PRACTICALS

1. Dissection of entire body.
2. Anatomical techniques: Fixation and preservation of dead bodies, preparation of museum specimens, preparation of bones.
3. Study of the normal plain & special X-rays of whole body, Computerized Tomography (CT) Scan, Sonogram, MRI etc. and correlate with the sectional anatomy of the body.
4. Surface marking & living anatomy.

SECTION – 2

HISTOLOGY AND HITOCHEMISTRY

Course content:

- Light and electron microscopic detailed structure of cell and its components, tissues of body, systems/organs and structural basis of function, general principles of light and other microscopes and principles of basic histological and cytological techniques.

PRACTICAL

- Principles of various microscopes.
- Identification of tissues and various organs of the body under the light microscope and identification of normal organelles in electron micrographs.
- Preparation of tissues for histological sections .
- Histological Staining: routine & special, identification of artifacts and three-dimensional interpretation.

SECTION – 3

DEVELOPMENTAL ANATOMY

Course content:

Gametogenesis, fertilization, implantation, development of placenta, early human embryonic development, assisted reproductive technology, the basic principles and sequential development of the organs and systems, the critical stages of development and the effects of common teratogens, genetic mutations and environmental hazards,
developmental basis of the variations, physiological correlations of congenital anomalies and postnatal growth & development.

PRACTICAL

Models/ specimens of human development and congenital malformations

SECTION – 4

NEUROANATOMY

Course content:

Development and structural organization of various parts of the nervous system with particular reference to their connections and functions, localisation and effects of lesions in different parts of the central nervous system and nerve injuries.

PRACTICALS

- Identification of structures in stained sections of brain and spinal cord.
- Staining of nervous tissue using Nissl staining.

SECTION – 5

a. IMMUNOLOGY

Course content

Immunity and the cell types involved in defense mechanisms of the body. Gross features, cytoarchitecture, functions, development and histogenesis of various primary and secondary lymphoid organs in the body. Biological and clinical significance of the major histocompatibility complex of man including its role in transplantation and genetic control of the immune response.

b. GENETICS

Course content

Structure of gene and chromosomes, karyotyping and banding patterns, chromosomal aberrations, inheritance, molecular genetics, mutations, genome imprinting, cancer genetics, reproduction genetics.

ASSESSMENT

Following each semesters, an end-semester examination in theory (Maximum marks 100), practical(Maximum marks 50) and viva-voce(Maximum marks 50) is conducted by the department on the topics scheduled for the semester. On completion of VIth semester, the

students shall take the final (University) M.Sc. examination conducted by the examination section.

a) INTERNAL (FORMATIVE) ASSESSMENT:

Postgraduates will be assessed regularly by conduction of theory and practical exams, seminar presentations, micro-teaching and viva-voce sessions.

b) UNIVERSITY (SUMMATIVE) ASSESSMENT:

The Final university examination will be held at the end of three years.

Pattern of summative examination

The components of postgraduate examination will be:

Theory examinations
Practical examinations
Viva-voce

Theory:

There will be **four** theory papers of 3 hours duration each. The course content is as follows:

University examination :

A. Theory: 4 papers **Total marks 400**

Paper-I : **MM 100**

- Gross anatomy, Comparative anatomy & Radiological anatomy.

Paper-II : **MM 100**

- Microscopic anatomy and histological techniques

Paper-III : **MM 100**

- Neuroanatomy including its development and microscopic structure.

Paper IV: **MM 100**

- Developmental anatomy, genetics and recent advances in anatomy

Each theory paper shall have two sections - 'A' and 'B'.
Each section shall have:

1. Structured long question 20 marks
2. Three short notes 5x3=15 marks
3. Three short notes 5x3=15 marks

B. Practicals:	**Total Marks 200**
C. Viva including Thesis viva	**Total Marks 100**
D. Internal Assessment(Theory+ Practicals)	**Total Marks 100**
Total (Theory and Practical)	800 marks

Criteria for passing: 50% in theory and practical separately.

A candidate obtaining ≥ 80% marks separately in theory and practical including viva-voce will be declared to have passed the subject with honours.

12. SUGESTED READINGS

Books:

Gross Anatomy Williams&RogerWarwick:

Gray'sAnatomy, 39thed., 2005, Churchill Livingstone London, Malbourne

John, V &Bassamjian, and M.D.: **Grant's Methods of Anatomy**, 10th ed., 1999, S.Chand& Co Ltd.

Romanes, G.J.: **Cunningham's Textbook of Anatomy**, 12th Ed, 1981, McMillan Press.

Snell RS: Clinical Anatomy by Regions, 8th ed. 2008, Lippincott Williams & Wilkins Baltimore.

Moore &Dalley: **Clinically oriented Anatomy**, 5th ed. 2006 Lippincott Williams & Wilkins, Baltimore.

Histology

Junqueira et al: **Basic Histology: Text & Atlas With CD Rom**., 10th ed., 2003 Prentice Hall, USA

Paul R. Wheater, H. George Surkitt& Victor G. Banials**: Functional Histology: AText and Colour**Atlas. 4th ed., 2000 ELBS, Churchill Livingstone.

Fawcett Don W. & Bloom William: **A Textbook of Histology**,12thed.,2002, Champion & Hall,

Genetics

Thompson J.S.: **Genetics in medicine**, 6th edition, 2001M.W. Thompson W.B. Saunders & Co. Philadelphia, London.

Neuroanatomy

Stuin J and Carpenter MB: **Human Neuroanatomy**, 9th edition, 1996

Snell R.S**.: Clinical Neuroanatomy**, 6th ed. 2006, Lippincott Williams & Wilkins.

Surface &Radiological Anatomy

Slaby and Jacob: **Radiographic Anatomy** 1990 National Medical Series for Independent Study, Harwal Publishing Philadelphia

Halim R.: **Surface & Radiological Anatomy**, 2nd ed., 1993, CBS Publishers, India.

Embryology

Sadler Langman's: **Medical Embryology**, 10th ed., 2006, Williams & Wilkins, Baltimore

William J L: **Human Embryology**, 3rd ed.2001, Churchill Livingstone

Moore Persaud:**The Developing Human Clinically Oriented Embryology** ,6th ed 1999, Harcourt Publishers International company', Singapur.