

THE TAMIL NADU Dr. M.G.R. MEDICAL UNIVERSITY
No. 69, ANNA SALAI, GUINDY, CHENNAI – 600 032.

M.D. / M.S.
POST GRADUATE DEGREE COURSES



SYLLABUS AND CURRICULUM

2021 - 2022

MD ANATOMY

THE TAMIL NADU Dr. M.G.R MEDICAL UNIVERSITY, CHENNAI

MD Anatomy

The purpose of the curriculum including the objectives, teaching-learning methods and assessment of the MD Anatomy programme is to prepare a competent clinical anatomist.

The candidate should be aware that in medical courses particularly at higher levels of qualification, syllabus cannot be and should not be a limiting factor in the quest for knowledge and the need for acquisition of skills.

General Conditions To Be Observed

- I. Postgraduate Medical Education in broad specialities shall be of three years
- II. Postgraduate curriculum shall be competency based.
- III. Learning in postgraduate programme shall be essentially autonomous and self-directed.
- IV. A combination of both formative and summative assessment is vital for the successful completion of the PG programme.
- V. A modular approach to the course curriculum is essential for achieving a systematic exposure

The training of PG students shall involve learning experiences 'derived from' or 'targeted to' the needs of the community. It shall, therefore, be necessary to expose the students to community based activities.

1. GOAL

The purpose of this programme is to standardize Anatomy teaching at Postgraduate level so that it will benefit by achieving uniformity in undergraduate teaching as well. Accordingly the training in M.D. Anatomy should stress on Applied Anatomy and Recent advances.

The goal of postgraduate medical education shall be to produce competent specialists and/or Medical teachers who shall:

- i. recognize the health needs of the community, and carry out professional obligations ethically and in keeping with the objectives of the national health policy
- ii. have mastered most of the competencies, pertaining to the speciality, that are required to be practiced at the secondary and the tertiary levels of the health care delivery system;
- iii. be aware of the contemporary advance and developments in the discipline concerned;

- iv. have acquired a spirit of scientific inquiry and have been oriented to the principles of research methodology and epidemiology; and
- v. who shall have acquired the basic skills in teaching of the medical and paramedical professionals;
- vi. Has acquired skills of integrating anatomy with other disciplines as and when needed.
- vii. Has acquired qualities of a good teacher capable of innovations in teaching methodology.

2. OBJECTIVES

(A) KNOWLEDGE (Affective Domain)

A candidate upon successfully qualifying in the M.D. (Anatomy) examination should be competent to do:

Teaching

- 1) Teach the undergraduate medical students gross anatomy, radiological anatomy, embryology, histology, neuroanatomy and elementary genetics with a focus on vertical integration and training as required for the Indian Medical Graduate.
- 2) Teach relevant anatomy for paramedical courses
- 3) Assess undergraduate students' knowledge, comprehension, application, analysis, synthesis and evaluation of the anatomical basis of clinical practice
- 4) Practising different methods of teaching-learning.

Research

- 1) Plan and implement a research project
 - 1.1 Acquire knowledge in the basic aspects of Biostatistics and research methodology.
 - 1.2 Has knowledge to plan the protocol of a thesis, carry out review of literature, execution of research project and preparation of report.
 - 1.3 Has ability to use computer applications Microsoft office (Microsoft word, excel, power point), Internet, Searching scientific databases (e.g. PubMed, Medline, Cochrane reviews).

2) Present their research work in a conference

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

(B) ATTITUDE (Cognitive Domain)

- 1) Be relevant and responsive to the needs of the students and community
- 2) Build rapport and co-operation in a group
- 3) Develop honest work ethics and empathetic behavior with students and colleagues.
- 4) Acquire capacity of not letting his/her personal beliefs, prejudices, and limitations come in the way of duty.
- 5) Acquire attitude and communication skills to interact with colleagues, teachers and students.

(C) SKILLS (Psychomotor Domain)

- 1) Plan, evaluate and modify the undergraduate curriculum.
- 2) Maintain a Gross Anatomy Lab and embalm a cadaver.
 - 2.1. Acquire mastery in dissection skills, embalming, and museum preparation.
- 3) Prepare tissues for light microscopic study, use and maintain a light microscope.
 - 3.1. Acquire mastery in staining.

3. COMPONENTS OF THE POSTGRADUATE CURRICULUM

• **Theoretical Knowledge**

Be able to demonstrate a thorough knowledge of the relevant clinical anatomy and recent advances of the following:

1) Gross Anatomy

1.1). General Anatomy: Tissues of the body, General osteology, Arthrology, Muscle & fascia, Nervous system, Principles governing arterial, Venous and lymphatic pathways, Innervation of blood vessels

1.2) Systemic Anatomy

1.3) Demonstrate knowledge about recent advances in medical sciences which facilitate comprehension of structure function correlations and applications in clinical problem solving.

2) Radiological Anatomy: Principles involved interpretation of normal plain and contrast radiographs, special investigative procedures and newer imaging techniques such as ultrasound, CT scans and MRIs

2) Embryology: a) General Embryology and b) Special embryology of all the systems of the body including variations and Congenital anomalies. Basic Molecular basis of development.

3) Genetics: Structure of chromosomes, Structure of genes, Karyotype, Chromosomal aberrations, Inheritance, Common Genetic disorders

4) Histology: Histological and Museum Techniques, Microscopes – Various types, General histology, Special histology of the Systems of the body including their electron microscopic appearance

5) Neuroanatomy: Structural organization of various parts of the nervous system with particular reference to their connections and functions, localization & effects of lesions in different parts of the central nervous system and nerve injuries.

6) Sectional Anatomy

7) Surface Anatomy

8) Describe immune system and cell types involved in defense mechanisms of the body. Also explain gross features, cytoarchitecture, functions, development and histogenesis of various primary and secondary lymphoid organs in the body.

9) Demonstrate knowledge about common techniques employed in cellular immunology and histocompatibility testing.

10) Explain collection, maintenance and application of stem cells, cryobanking and principles of organ donation from recently dead bodies.

11) Demonstrate knowledge about different anthropological traits and use of related instruments.

12) Demonstrate knowledge about outline of comparative anatomy of whole body and basic human evolution

13) Demonstrate knowledge about identification of human bones, determination of sex, age, and height for medico legal application of anatomy

- **Practical Skills**

Demonstrate competency to:

- 1) Use appropriate audio-visual aids
- 2) Conduct large group teaching using a variety of methods
- 3) Conduct small group teaching using a variety of methods
- 2) Take seminars
- 3) Embalm a cadaver and describe the medico-legal aspects
- 4) Dissect and prosect a cadaver
- 5) Use and maintain a light microscope
- 6) Prepare histological slides
- 7) Demonstrate anatomical basis of common clinical procedures expected to be performed by a basic medical doctor.

- **Writing Thesis/Research Articles**

Critically analyze a journal article and make a presentation

- **Attitudes including Communication Skills**

Demonstrate: humility, perseverance, initiative, determination and team-work

- **Training in Research Methodology, Medical Ethics /Bioethics and Medicolegal aspects:**

- Should compulsorily attend the Research methodology workshop conducted by the University within first six months of M.D course.
- May attend Bio-ethics workshops/CMEs conducted by the University and other reputed Institutions.
- Will learn aspects related to Medical Ethics/Bioethics, Moral and legal issues.
- Demonstrate sensitivity to issues related to use of cadavers in relation to regional religious and cultural aspects such as awareness of the need to respect the cadaver and cover the parts of the cadaver which are not being studied.

4. THEORY AND PRACTICAL SYLLABUS

Gross Anatomy

Osteology– Skeletal and connective tissue – cartilage and bone, Ossification of bones, appendicular & axial skeleton and skull

Arthrology– Movements and mechanisms of joints, Joints of upper and lower limbs, Vertebral and thoracic articulations, Joints of skull, Temporomandibular joint

Myology – Structure and functions of various muscles, Muscles of Head & neck, Trunk and limbs

Angiology– Vascular patterns, Heart, Vessels of Head, neck, brain, Trunk and limbs.
Regional lymph nodes and vessels

Neurology– Central & peripheral nervous system, Spinal cord, Brainstem, Cerebellum and Cerebrum

Splanchnology–Respiratory, Alimentary, Urogenital and Endocrine

Immunology:

- Immune system 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, disease susceptibility/resistance and genetic control of the immune response.
- Common techniques employed in cellular immunology and histocompatibility testing.
- Molecular hybridization and PCR technology in immunology research particularly mechanism of antigen presentation, structural and functional relevance of the T cell receptor, genetic control of the immune response. Molecular basis of susceptibility to disease.
- Anthropology
Different anthropological traits, Identification and use of Anthropological instruments.

- Forensic Medicine:
Identification of human bones from their remains and determination of sex, age, and height. for medico legal application of Anatomy.
- Outline of comparative anatomy of the whole body and basic human evolution

EMBRYOLOGY AND GENETICS, MICROSCOPIC ANATOMY AND MUSEUM TECHNIQUES

General Embryology- Stem cell Applications, Cloning & Molecular biology. Gametogenesis, Fertilization, Implantation, Early development of embryo and development of various organ systems,

- **Physiological correlations of congenital anomalies.**

Systemic Embryology- Congenital malformations and basics of molecular basis of congenital malformations

Basics of Medical Genetics, Clinical genetics Genomics and DNA analysis Human chromosomes –Structure, Aberrations, Cytogenetics, Gene — Structure, Function, disorders and gene therapy.

Cancer Genetics - Haematological malignancies, Pharmacogenetics.

Patterns of inheritance, Mutations, Prenatal diagnosis, Genetic counseling

Practical-Identification of slides of various stages of development of embryos- human/chick/pig, Cell culture, harvesting of chromosomes, identification and interpretation

Museum and Embalming techniques

Neuro anatomy

Histology

Basic cell biology – Cell structure, Cell cycle, Cell divisions and differentiation

General histology– Tissues of the body structure and function.

Systemic histology– Histology of all organ systems, with function and histogenesis

Immune system and cell types involved in defense mechanism, Clinical significance of major histocompatibility complex, Immunohistochemical techniques

Practical-Preparation and processing of tissues for histological study

Staining– Special stains for identification of various components, Histomorphometry

Electron micrographs-Identification of cells and cell organelles

Neuroanatomy

Structure and function of various tracts of spinal cord. Blood supply of spinal cord – arterial and venous drainage with clinical significance.

Parts of brain and its blood supply– arterial and venous drainage with clinical significance
Cross section of brain at various levels– normal structure and clinical significance
Various neurological disorders – somatic and sensory

Ventricles of brain, CSF secretion and drainage and Barriers of the brain tissue
Cranial nerves–connections, functions and distribution

Practical- Identification of neurons and nerve fibers–routine and special stains
Cross section of spinal cord at various levels

Cross section of Parts of Brainstem at various levels

Cross section of Cerebrum and cerebellum, both coronal and horizontal at different levels for the identification of various nuclei, their structure and functions and their correlation with various neurological disorders

Applied Human Anatomy and recent advances in medical sciences

Anatomy relevant to common surgical conditions and related procedures

- **Collection, maintenance and application of stem cells, cryobanking and principles of organ donation from recently dead bodies.**

Biostatistics - Basic principles and concepts of biostatistics applied to health sciences
Parametric & Nonparametric data, Mean, Median, Mode, Standard deviation, Standard error, Analysis of variance, coefficient correlation, Chi-square test, t-test.

Exposure to the following is desirable: Training in Medical Audit, Management, Health Economics, Health Information System, basics of statistics, exposure to human behavior studies, knowledge of pharmacology — economics and introduction to non-linear mathematics.

Departmental Resources:

It is mandatory for the department of Anatomy to develop at least three of the following laboratories, in addition to the other facilities. The laboratory should be involved in active research in at least one well defined field.

1. Histology
2. Immunology
3. Electron microscopy/ Fluorescence microscopy/ confocal and other forms of microscopy laboratories
4. Developmental anatomy
5. Anthropometry
6. Neuroanatomy
7. Cytogenetics
8. Imaging technique for Radiological Anatomy

5. TEACHING LEARNING METHODS

Lectures, videos, seminars, journal clubs, directed study of texts, preparation for teaching (micro-teaching), group tutorials, group dynamics, integrated learning, facilitating learning and setting ground rules, small group teaching-learning methods and discussion techniques, computer based teaching and learning, Information technology and browsing the internet (e.g. use of Google scholar), conducting tests and assessments for learning, appraisal of students, mentoring students, encouraging life-long learning, being prepared to learn from students, giving students opportunities to learn by doing (e.g. drawing diagrams), planning and thinking about the learning environment, preparing a lesson plan (including resources, activities and hand-outs), reflecting and thinking how the session can be improved the next time, getting participation of students by brainstorming, quizzing, buzz groups, role plays, encouraging learning, so that learning will be purposeful, involve voluntary participation of students, have specific learning objectives, give constructive feedback to students, and have opportunity for facilitated reflection

The teaching of the students shall be through Lectures, Seminars, Journal Clubs, Group Discussions, Participation in laboratory and experimental work, and involvement in Research Studies in the concerned speciality and exposure to the 'Applied aspects' of the subject relevant to clinical specialities".

6. STRUCTURED TRAINING PROGRAMME

The **competency** of the student would be assessed by the guide at each stage. Feedback would need to be given, so that the student demonstrates competency at every stage and then progresses to the next stage.

MAIN POSTING

Teaching UG students
Dissection and making at least five prosections or museum specimens
Preparation of at least five histology slides
Research

PERIPHERAL POSTINGS

- 1) Radiology
- 2) Cytogenetics
- 3) Medical and Surgical Disciplines

Suggested outline for the course:

FIRST YEAR

Teaching	Should get involved in teaching of Gross Anatomy/applied to first year MBBS students during dissection hours on all working days	12 hrs/week
	Should get involved in small group teaching session– teaching of bones and microscopic slides of histology– demonstration classes	Osteology 4hrs/week Histology 4hrs/week
Learning	Should be posted in departments of Medical and Surgical Disciplines and in Cytogenetics to acquire surgical anatomy skills and knowledge of clinically oriented problems	About one month in each department
Laboratory Skill	Should assist and guide first year MBBS students in the dissections of the cadaver. Should assist and guide in identification of general & systemic histology slides of various tissues and organs for MBBS students Should acquire knowledge and be acquainted with the knowledge of various types of microscopes their configuration and applications. Should acquaint him/herself with and necessary training in computer operations for data retrieval and power point presentations etc. for teaching & research.	12 hrs/week Histology 4hrs/week
Research	Should get involved in preparation of research protocol for PG dissertation work– selection of problem, literature search, application of methods, selection of material, methods of analysis of data and hypothesis. Discussion with Supervisor/Guides&Coguides	2 hrs/week

SECOND YEAR

Teaching	Should get involved in teaching of Gross Anatomy/applied to first year MBBS students during dissection hours on all working days	12 hrs/week
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	Should get involved in small group teaching sessions– teaching of bones and microscopic slides of histology– demonstration classes	Osteology 4hrs/week Histology 4hrs/week
	Should be involved in correction work/assessment by Periodic Notified Test conducted for the first year MBBS students– both in theory and practical including viva voce.	

Learning	Communication skills and knowledge through seminars and journal clubs	2 hrs/week
Laboratory Skill	In addition to the above, candidate should acquire the necessary training in 1. embalming of cadavers of all types 2. tissue processing viz. fixation, dehydration, clearing and embedding 3. staining– routine hematoxylin and eosin staining 4. special staining for epithelium, connective tissue, muscle, gland & nervous tissue 5. museum technique — mounting of specimens for museum both wet and dry, making of various type of models, injection corrosion cast & 6. plastination techniques. Cytogenetics techniques– cell culture, harvesting and processing blood samples for karyotyping. Various types of banding techniques. <u>Optional (If facilities available)</u> Automated karyotyping using software	
Research	Maintenance of work book/logbook pertaining to dissertation work undertaken and the same to be documented in electronic format. Discussion with Supervisor/Guides & Co-guides	2 hrs/week

During second year, the Students are encouraged to undergo special postings for learning new advanced techniques / procedure / skills in institutions of higher repute where the requisite facilities are available without affecting the duties of the parent department.

THIRD YEAR

Teaching	Should get involved in teaching of Gross Anatomy/applied to first year MBBS students during dissection hours on all working days	12 hrs/week
	Should get involved in small group teaching session—teaching of bones and microscopic slides of histology—demonstration classes	Osteology 4hrs/week Histology 4hrs/week
	Should be involved in correction work / assessment of Periodic Notified Test conducted for the first year MBBS students— both in theory and practicals including viva voce.	
	Should be involved in organizing/delivering lectures for first year MBBS students on selected topics of interest in Gross Anatomy, Human Embryology & Medical Genetics Learning programmes.	12 hrs/week

Learning	Should obtain the necessary skills in delivering lectures through computer assisted teaching – Power point presentation	
Laboratory Skill	Should have equipped appropriately with the guidelines required to undertake and perform embalming procedures. Should be aware of—Anatomy Act Other Techniques tissue processing viz. fixation, dehydration, clearing and embedding, staining— routine hematoxylin and eosin special for epithelium, connective tissue, muscle, gland & nervous tissue museum technique — injection corrosion cast, resin cast of organs and plastination technique.	Minimum of two cadavers Should submit a minimum of five H&E slides and at least one model of any one among the procedures stated.

Research	Discussion with Supervisor/Guides & Co-guides to achieve the following: Analyze the data of dissertation work and present it comprehensively in the required format Should attend and present the work done on dissertation in Scientific bodies – either in the regional or at national conferences. Should be aware of ethical issues related to human and animal investigative procedures.	In the scheduled time Minimum one paper 2 hrs/week
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7. Evaluation of the candidates in both theory and practical aspects will help the candidate in improvement of his/her knowledge, skills and attitude.

8. COMPETENCY ASSESSMENT:

1 OVERALL:

- | | | |
|---|-----|-----------|
| a) Communication / commitment / Contribution / | () | |
| Compassion towards patients and Innovation | () | - 5 Marks |
| b) Implementation of newly learnt techniques/skills | () | |

2	Number of cases presented in Clinical Meetings/ Journal clubs/seminars	- 5 marks
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3	Number of Posters/Papers presented in Conferences/ Publications and Research Projects	- 5 marks
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4	No. of Medals / Certificates won in the conference / Quiz competitions and other academic meetings with details.	- 5 marks
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Total	----- 20 Marks -----
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PG NON – CLINICAL COURSE

VIVA including Competency Assessment	- 60 Marks (40 + 20)
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Pedagogy	- 40 marks
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ASSESSMENT SCHEDULE IS AS FOLLOWS

Year of study	Period				Total Max.20 marks
I year	Upto Dec	10 marks	Upto June	10 marks	20 Marks
II year	Upto Dec	10 marks	Upto June	10 marks	20 Marks
III year	Upto Oct	10 marks	Upto Feb	10 marks	20 Marks
	AVERAGE				20 Marks

9. DISSERTATION AND PUBLICATION IN UNIVERSITY JOURNAL OF MEDICAL SCIENCES:

As per the 49th SAB Resolution under Point No. 2 and in the 52nd SAB it was reiterated regarding the topic for dissertation

The topic for the dissertation should be registered and sent to the University after Ethics Committee approval before 31st of December of the first Post Graduate Year. Only one change of topic with proper justification from the Head of the Department is permitted before 31st March of the first Post Graduate Year. The change of dissertation title will not be permitted after 31st March of the First Post Graduate Year. This modification in regulation will be scrupulously followed from the academic year 2015-16 admission onwards.

As per Medical Council of India Post Graduate Medical Education Regulations 2000 (amended upto 10th August 2016) clause 13.9 A Postgraduate student of a Postgraduate degree Course in broad specialties/Super Specialties would be required to present one poster presentation to read one paper at a National/State conference and to present one Research paper which should be published/accepted for publication/sent for publication during the period of his Postgraduate studies so as to make him eligible to appear at the Postgraduate Degree Examination.

As per MCI Clause 14 (4)(a), thesis shall be submitted atleast 6 Months before the Theory and Clinical/Practical Examination.

A candidate shall be allowed to appear for the Theory and Practical/Clinical Examination only after the acceptance of the Thesis by the Examiners.

The periodical evaluation of dissertation/log book should be done by the guide / HOD once in every six months. The HOD should ensure about the submission of dissertation within the stipulated time.

Regarding submission of articles to the University Journal of Medical Sciences for all the PG Degree/Diploma courses, it is mandatory that the students have to submit at-least one research paper. Case Reports are not considered as Research Paper

10. THEORY EXAMINATION

There shall be four theory papers.

Paper I: Gross Anatomy

Paper II: Embryology, Microscopic Anatomy and Genetics

Paper III: Neuroanatomy

Paper IV: Applied Human Anatomy and recent advances in anatomical Sciences Theory Papers

Paper I: Gross Anatomy

- a). Gross Anatomy of whole human body i.e. upper limb, lower limb thorax, abdomen, pelvis, head and neck
- b) Method of preservation of human body and its parts, radiological anatomy, sectional anatomy.

Paper II: Embryology, Microscopic Anatomy and genetics

- a). General Principles of genetics, Cytogenetic as applicable to medicine and different genetic disorders, gene therapy.
- b) General Embryology, Systemic Embryology, methods of experimental embryology, clinically oriented embryology and teratology
- c) Histology (including fine structure) of tissues and organs of the body.
- d) Principles of light, transmission and scanning electron microscopy, confocal, virtual microscopy.

Paper III: Neuroanatomy Neuroanatomy - gross and applied aspects

Paper IV: Applied Human Anatomy and recent advances in medical sciences

- (a) Clinical and applied aspect of Anatomy
- (b) Recent advances in the application of knowledge of anatomy on human body
- (c) Collection, maintenance and uses of stem cells
- (d) Cryobanking
- (e) Basics of principles of organ donation from recently dead bodies.

Each paper will have

Structured Essay Questions -	2 x 15 Marks = 30 Marks	Short
Notes	- 10 x 5 Marks = 50 Marks	
Reasoning out	- 4 x 5 Marks = 20 Marks	

Total		100 Marks
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9. PRACTICAL EXAMINATION

MD ANATOMY	
PRACTICAL I	
GROSS ANATOMY - Dissection	75 marks (A)
PRACTICAL II	
HISTOLOGY (SECTION CUTTING + EMBEDDING & STAINING) HISTOLOGY SLIDES DRAWING & DISCUSSION	75 marks (B)
PRACTICAL III	
OSPE (20 Stations) - 40 marks	50 marks (C)
EMBRYOLOGY SLIDES - 5 marks	
NEUROANATOMY SLIDES - 5 marks	
VIVA VOCE	
PEDAGOGY	40 marks (D)
VIVA	60 marks (E)
AGGREGATE (PRACTICAL + VIVA) TOTAL	300 marks (A+B+C+D+E)
MINIMUM REQUIRED FOR PASS (50 %)	150 marks
DISSERTATION	APPROVED / NOT APPROVED

12. LOG BOOK –

The Post Graduate students shall maintain a record (Log) book of the work carried out by them and the training Programme undergone during the period of training.

The record (log) book shall be checked and assessed periodically by the faculty members imparting the training.

Periodic review of Log book and Dissertation have to be done in the Department by guide/HOD once in every 6 months.

13. VIVA INCLUDING COMPETENCY ASSESSMENT (20 marks)

40 + 20 = 60 marks

14. PEDAGOGY

40 marks

(8 minutes Presentation and 2 Minutes Q & Ans)

- Demeanour - 10
- Audio visual Aids usage, voice modulation and Attitude - 10
- Subject Content - 10
- Q & Ans /Interaction - 10

Total

40 Marks

15. OSPE - 20 Stations

40 marks

There would be at least one observed type of station, where the examiner would observe the performance of the student demonstrating a skill and would give a score using a checklist.

Examples include 1) perform a surface marking, 2) prepare Power Point slides, 3) use a light microscope and 4) use small group teaching techniques.

The other stations would be response type of stations, where the student would respond to structured questions.

1. Practicals: spread over a minimum of 2days First Day

Practical:

(a): Gross Anatomy

Dissection and related viva voce

(b): Histology

Spotting (10 spots) and viva voce

Techniques paraffin block making, section cutting. Staining (H and E stain) with related viva

Second Day Practical :

a) Microteaching of a short topic to assess teaching skills

A short synopsis of the thesis work should be presented by the post graduate student

Grand viva including Gross anatomy, cross sectional anatomy, radiological Anatomy, Surface Anatomy, Embryology

Practical and Oral/Viva-Voce Examination

Practical Examination to be organized as per details given below:

Dissection on
cadaver Histology
spotting Histological
techniques Surface
Marking Radiology

Teaching ability
Thesis
presentation

Oral/Viva-voce Examination

Grandviva

On dissected parts of the whole human body including nervous system, and Embryology models, teratology, skeletal system including short bones, embalming techniques and genetics, radiographs, MRI, CT & ultrasonographs.

16. REFERENCE BOOKS

Gross Anatomy

Cunningham's Manual of Practical Anatomy. GJ Romanes

Gray's Anatomy, The Anatomical Basis of Clinical Practice. S.StandringClinically

Oriented Anatomy, KL Moore, AF Dalley, AMR Agur

Gray's Anatomy for Students. 1st South Asia Edition. RL Drake, AW Vogl, AWM Mitchell

Gross Anatomy:

1. Dutta A.K. Human Anatomy vol. I-III Current Publisher.
2. Dutta A.K. Principle of General Anatomy. Current Publisher.
3. R.S. Snell. Clinical Anatomy by regions. Lippincot Williamsand Wilkins.
4. J.V. Basmajin. Grant's Method of Anatomy. Williams andWilkins.
5. R.J. Last. Anatomy Regional and Applied. Churchill Livingston.
6. Lee McGregor. Surgical Anatomy. K.M. Varghese.
7. A.G. R Deckeg, D.J du Pless Lee. Mc Gregor's Synopsis of Surgical Anatomy. Varghese Publishing House.
8. S. Chummy Sinnatanmy. Last's Anatomy Regional and Applied. Churchill Livingston.
9. Hollinshed W Henry. Anatomy for surgeons. Vol. I-III Lippincotts, Williams and Wilkins.
10. Vishram Singh. Clinical and Surgical Anatomy. Elsevier.
11. Vishram Singh. Textbook of general anatomy. Elsevier.
12. Frank H. Netter. Atlas of Human Anatomy. Saunders Elsevier.

Surface Anatomy

Surface and Radiological Anatomy 3rdEdn A Halim Surface

Anatomy: Pocket Tutor (2012) R Tunstall, N Shah

1. SP John, Lumley editors. Surface Anatomy, The Anatomical basis of clinical examination. London: Churchill Livingstone.
2. A. Halim. and A.C. Das. Surface Anatomy Lucknow. ASI,KGMC.

Radiological Anatomy

Applied Radiological Anatomy for Medical Students P Butler, A Mitchell, H Ellis

1. T.B. Moeller et.al. Sectional Anatomy CT and MRI Vol. I, II,III New York. Theme Stuttgart.
2. J.B. Walter et.al. Basic Atlas of Sectional Anatomywith correlated imaging. Saunders Elsevier.

Embryology

Medical Embryology by Jan Langman.

Human Embryology by Inderbir Singh.

Before we are Born: Essentials of Embryology and Birth defects 9thEdn KL Moore, TVN Persaud,

MG Torchia

Human Embryology and Developmental Biology 5thEdn BL Carlson

Larsen's Human Embryology 5thEdn G Schoenwolf, S Bleyl, P Brauer, P Francis-West

1. Hamilton, Boyd. and Mossman. Human Embryology.
2. Rani Kumar. Text book of embryology. I.K. International NewDelhi

Genetics

Genetics in Medicine – J.S.Thompson & M.W. Thompson.

Elements of Medical Genetics by Emery.

1. George Fraser and Oliver Mayo. Text book of Human Genetics. Blackwell Scientific Publications London, Oxford
Edinburg, Melbourne.
2. Hann Sellwenger and Jame Simpson. Chromosomes of Man.
Sparsner's International Medical Publications.

Embalming & Museum Techniques

Anatomical Techniques by Tompsett.

Embalming Techniques by Dr. Jayavelu.

Neuroanatomy

Clinical Neuroanatomy 7thEdn RS Snell.

Text Book of Clinical Neuroanatomy 2ndEdn. Vishram Singh.

Inderbir Singh' Textbook of Human Neuroanatomy 9thEdn. by PS Bhuiyan

1. A. Parent. Carpenter's Human neuroanatomy. Williams andWilkins.
2. A. K. Dutta. Essentials of Neuroanatomy. Current books
international.
3. John A. Kiernan. Barr's the human nervous system,
Lippincott, Williams &Wilkins.

Surgical & Applied

Last's Anatomy: Regional & Applied Anatomy 12thEdn. by CS SinnatambyLee

McGregor's Synopsis of Surgical Anatomy 12thEdn. GA DEcker.

Skandalakis Surgical Anatomy: The Embryologic and Anatomic Basis ofModern
Surgery. JE

Skandalakis

Clinical Anatomy 12thEdn H Ellis, V Mahadevan

Histology

Bancroft's Theory and Practice of Histological Techniques 7thEdn

Bloom & Fawcett's: Concise Histology, 2ndEdn, DW Fawcett

Janqueira's Basic Histology 14thEdn, AL Mescher

Wheater's Functional Histology 6thEdn B Young, G O'Dowd, P Woodford

A text and Atlas, 7thEdn MH Ross and W Pawlina

1. V. Bharihoke. Text book of human histology. Delhi AITBS.
2. Difiore's. Atlas of histology with functional co-relation.
3. Carlton's. Histology Technique.
4. E.C. Clayden. Practical of section cutting and staining.
5. D W Cormack. Ham's Histology. Lippincotts, Williams andWilikins.

Statistics`

1. David E. Matthews and Vernon T. Farewell. Using and Understanding Medical Statistics. Karger.

** Note : The editions are as applicable and the latest editions shall be the part of the syllabi.

17. JOURNALS

- 1) Clinical Anatomy
- 2) Journal of the Anatomical Society of India
- 3) Anatomical Sciences Education
- 4) Journal of Clinical and Diagnostic Research
- 5) International Journal of Anatomical Variations
- 6) European Journal of Anatomy
- 7) Surgical and Radiologic Anatomy

Postgraduate Students Appraisal
Form Pre / Para /Clinical
Disciplines

Name of the Department/Unit :

Name of the PG Student :

Period of Training : FROM.....TO.....

Sr. No.	PARTICULARS	Not Satisfactory	Satisfactory	More Than Satisfactory	Remarks
		1 2 3	4 5 6	7 8 9	
1.	Journal based /recent advances learning				
2.	Patient based /Laboratory or Skill based learning				
3.	Self directed learning and teaching				
4.	Departmental and interdepartmental learning activity				
5.	External and Outreach Activities / CMEs				
6.	Thesis / Research work				
7.	Log Book Maintenance				

Publications

Yes/ No

Remarks* _____

***REMARKS:** Any significant positive or negative attributes of a postgraduate student to be mentioned. For score less than 4 in any category, remediation must be suggested. Individual feedback to postgraduate student is strongly recommended.

SIGNATURE of ASSESSEE

SIGNATURE OF HOD

SIGNATURE OF CONSULTANT