

# ALL INDIA INSTITUTE OF MEDICAL SCIENCES



## AIIMS BIBINAGAR



*Hyderabad Metropolitan Region – Telangana*

*Department of Anatomy*



**ALL INDIA INSTITUTE OF MEDICAL SCIENCES, BIBINAGAR**

(Hyderabad Metropolitan Region), Telangana

# PG CURRICULUM OF ANATOMY



## Goal

To develop a medical specialist in Anatomy who is globally acceptable, thorough, and reasonably up-to-date.

## Objectives

At the end of the three years' post-graduate training programme in Anatomy the student should be able to:

1. Acquire in depth knowledge of structure of human body from the gross to the molecular level, and correlate it with the functions.
2. Comprehend the principles underlying the structural organization of body and provide anatomical explanations for disturbed functions.
3. Acquire knowledge of basic principles of normal growth and differentiation. Understand critical periods of human growth and development as well as ontogeny of all the organ systems of body. Analyze the congenital malformations, know the etiological factors including genetic mechanisms involved in abnormal development and their effects on functions.
4. Have comprehensive knowledge of the basic structure and correlated function of the nervous system in order to understand altered state in the various disease processes.
5. Plan and implement teaching programmes for under-graduate medical students. Be familiar with and be able to use different teaching methods and modern learning resources for under-graduate teaching. Plan and conduct evaluation of under-graduate teaching.
6. Develop/acquire an attitude of scientific enquiry and learn contemporary research techniques. Be familiar with recent scientific advances, identify lacunae in the existing knowledge in a given area and be able to plan investigative procedures for research, analyze data critically and derive logical conclusions.



## Syllabus

### Course content:

- 1) Regional Anatomy, Gross Anatomy and Surgical Anatomy
- 2) Histology, Histochemistry and Histological techniques
- 3) Embryology & Genetics
- 4) Neuroanatomy, Recent advances
- 5) Biostatistics & Basic principles of Research
- 6) Embalming and Museum techniques

### Regional Anatomy, Gross Anatomy and Surgical Anatomy:

- Osteology – Skeletal 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 vessels
- Neurology – Divisions – Central & peripheral, Spinal cord, Brainstem, Cerebellum and Cerebrum
- Splanchnology – Respiratory, Alimentary, Urogenital & Endocrine

### Practical –

- Dissection of entire body
- Surface Anatomy - deals with anatomical features that can be studied by inspection and palpation, without dissection
- Living Anatomy - the study of anatomy in the living individual
- Imaging Anatomy - Interpretation 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.
- Forensic Anatomy – combines the understanding of Anatomy with forensic techniques to determine the identity of human remains and medico legal aspects pertaining to Anatomy
- Anthropology - Identification of races and genders with different anthropological traits; anthropometric techniques.
- Embalming techniques - Fixation and preservation of dead bodies



- Comparative Anatomy - Basic outline of evolution and comparative anatomy of human body

## Histology, Histochemistry and Histological techniques:

- Cell biology – Cell structure, Cell cycle, Cell divisions and differentiation
- Principles and working of light, electron, confocal, fluorescent and scanning microscope
- General histology – Tissues of the body structure and function.
- Systemic histology – Histology of all organ systems, with function and histogenesis
- Immunology and molecular biology - Immune system and cell types involved in defense mechanism. Clinical significance of major histocompatibility complex.
- Immunohistochemical techniques - Techniques of DNA preparation, electrophoresis and southern blot hybridization, DNA Isolation from peripheral blood lymphocytes, Polymerase Chain Reaction (PCR), Fluorescence In-Situ Hybridization (FISH), Chromosomal Analysis.

## Practical –

- Preparation and processing of tissues for histological study
- Staining – Special stains for identification of various components
- Histomorphometry
- Electron micrographs - Identification of normal and abnormal organelles in electron micrographs , three dimensional interpretation, artifacts identification.
- Techniques of DNA preparation, electrophoresis and southern blot hybridization, DNA Isolation from peripheral blood lymphocytes, Polymerase Chain Reaction (PCR), Fluorescence In-Situ Hybridization (FISH), Chromosomal Analysis.

## Embryology & Genetics:

- General Embryology - Gamatogenesis, Fertilization, Implantation, development of placenta, early development of embryo and congenital malformations and molecular basis of congenital malformations, assisted reproductive technologies



- Systemic Embryology – development of various organ systems and associated congenital malformations and molecular basis of congenital malformations
- Stem cell Applications, Cloning & Molecular biology.
- Basics of Medical Genetics - Clinical genetics, Genomics and DNA analysis
- Human chromosomes – Structure, Aberrations, Syndromes
- Molecular cytogenetics - Gene structure, function, disorders and gene therapy, patterns of inheritance, mutations
- Prenatal diagnosis, Genetic Counseling

### **Practical:**

- Identification of slides of various stages of development of embryohuman/chick/pig
- Cell culture, harvesting of chromosomes, identification and interpretation.

### **Neuroanatomy:**

- Structure and function of various tracts of spinal cord and its blood supply – 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 Brain stem 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 function to correlate with various neurological disorders.



## Biostatistics & Basic principles of Research:

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

## Recent advances:

- Advancements pertaining to anatomical aspects of medical science in the areas of functional aspects of body parts, sectioning and preservation techniques, operative and clinical /procedural interventions, neuroscience, microanatomy, development and imaging.

## Embalming and Museum techniques:

- Embalming – training in different methods of embalming procedures
- Museum techniques - preparation of museum specimens, preparation of bones, preparation of corrosion casts and plastination.





## Learning activities, training and evaluation

During the course students have formal teaching and are trained for teaching and research

### I Didactic Teaching

Topics in gross anatomy, microanatomy, embryology, neuroanatomy, histochemistry, and genetics, along with related practical sessions

### II Training

- Communication skills – journal club, seminars
- Hands on experience — techniques in micro, neuro, gross anatomy, embryology, histochemistry, genetics, electron and confocal microscopy.
- Teaching experience — taking UG classes : demonstrations and practicals for two semesters (one academic year)
- Educational technology — preparation of AV aids for teaching, posters/manuscripts for presentation in conferences/workshops and publication in journals. Setting objective questions – SAQs, MCQs and OSPE. Prepare teaching modules & museum specimens, casts. Participation in organization of symposia/workshops.

### III Research

- Thesis – progress monitoring every semester.
- Presenting paper/poster at conferences/Preparing manuscripts for documentation.
- Thesis work presentation.
- Thesis submission at the end of 2&1/2 yrs.

### IV Evaluation of Training

- Written/practical assessment every semester.
- Feedback on teaching/training programmes.





**Recommended books**

**Gross Anatomy:**

1. Gray's Anatomy. Susan Standring , 41<sup>st</sup> edition, 25th September 2015, Elsevier
2. Romanes, G.J.: Cunningham's Manual of Practical Anatomy, 16th Ed, 2018, OUP Oxford
3. Moore & Dalley: Clinically oriented Anatomy, 7th ed. 2013 Wolters Kluwer
4. A.K. Dutta: Essentials of Human Anatomy 3 Volume 3rd Edition, Current Book, 2004.
5. Patrick, Tank.W: Grant's Dissector 16th Edition, LWW RS CLASSIC, 2017.
6. Frank H. Netter. 7<sup>th</sup> edition, 2019, Atlas of Human Anatomy. Saunders Elsevier.
7. Snell RS: Clinical Anatomy by Regions, South Asian Edition. 2018, Wolters Kluwer.

**Applied Anatomy:**

1. S. Das. A manual on Clinical Surgery, 15<sup>th</sup> edition, 2021.
2. McGregor. Synopsis of Surgical Anatomy, 12<sup>th</sup> edition. CRC Press
3. Hutchinson's clinical methods, 24<sup>th</sup> edition. Elsevier

**Comparative Anatomy:**

1. Comparative Anatomy of the vertebrates – George Kent. 9<sup>th</sup> edition. McGraw Hill.

**Histology:**

1. Michael H. Ross and Pawlina. Histology: A Text and Atlas: With Correlated Cell and Molecular Biology, 7<sup>th</sup> edition, 2015, Wolters Kluwer
2. Wheaters Functional, Histology, 6<sup>th</sup> edition, 2014, Barbara Young, Elsevier
3. Junqueira'S Basic Histology: Text And Atlas 15Ed. Tata McGraw Hill
4. Difiores Atlas Of Histology With Functional Correlations. 13<sup>th</sup> edition, 2017, Wolters Kluwer

**Embryology:**

1. Langman's Medical Embryology. South Asian Edition. 2019. Wolters Kluwer
2. K.L Moore The Developing Human: Clinically Oriented Embryology, 9<sup>th</sup> edition, 2013, Elsevier
3. Hamilton Human Embryology , 4<sup>th</sup> edition, 1972. Palgrave Macmillan

**Genetics:**

1. Thompson & Thompson Genetics in Medicine, 8<sup>th</sup> edition. 2015. Elsevier
2. F. Robert Mueller: Elements of Medical Genetics ,13<sup>th</sup> Edition, ChurchillLivingston, 2007
3. George Fraser and Oliver Mayo. Text book of Human Genetics. Blackwell Scientific Publications London, Oxford Edinburg, Melbourne.



## **Neuroanatomy:**

1. Carpenter's Human Neuroanatomy. 9<sup>th</sup> edition, 1996. Lippincotts William
2. Snell's Clinical Neuroanatomy. 8<sup>th</sup> edition. 2018. Wolters Kluwer
3. Clinical Neuroanatomy Richard S. Snell for Medical Students Willian and Wilkins 5th edition, 2001

## **Histotechniques and museum techniques and embalming:**

1. Bancrofts theory and practice of histological techniques. 7<sup>th</sup> edition, 2013. Churchill Livingstone
2. Tompset: Anatomical Techniques
3. Dr.Jayavelu : Embalming Techniques
4. M.L. Ajmani: Embalming Principles & Legal Aspects ,2009,Jaypee Publication
5. Drury R.A.B: Carltons Histological Techniques - Wallington E.A

## **Surgical and radiological Anatomy:**

1. Halim R.: Surface & Radiological Anatomy, 2nd ed., 1993, CBS Publishers, India.
2. T.B. Moeller et.al:Sectional Anatomy CT and MRI Vol. I, II, III New York.Theme Stuttgart.
3. J.B. Walter et.al:Basic Atlas of Sectional Anatomy with correlated imaging. Saunders Elsevier.
4. Slaby and Jacob: Radiographic Anatomy 1990 National Medical Series for Independent Study, Harwal Publishing Philadelphia

## **Biostatistics:**

1. P.S.S Sunder Rao.: An Introduction to Biostatistics a Manual for students in Health Sciences ,3rdEdition, Prentice-Hall, 1996
2. David E. Matthews and Vernon T. Farewell: Using and Understanding Medical Statistics. Karger.

## **Journals:**

1. Journal of Anatomy
2. Anatomical Record
3. Developmental Dynamics
4. Cells, Tissue and Organs (Acta Anatomica)
5. Biology of Reproduction
6. Genetical Research
7. Journal of Pineal Research
8. Mutation research & Environmental mutagenesis
9. American Journal of Medical Genetics
10. Journal of Medical Genetics



**Outline of Teaching Learning activities**

**I year of Post-Graduation:**

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	<b>Posted in CM&amp;FM –</b> <ul style="list-style-type: none"> <li>• Formulate hypothesis for research</li> <li>• Calculate sample size for any research</li> <li>• Use tools for literature review</li> <li>• Perform basic statistical analysis like mean, standard deviation, chi square, student t test</li> <li>• Draft a project proposal</li> </ul>	30 days
	<b>Posted in Radiology-</b> <ul style="list-style-type: none"> <li>• Read a normal x ray of all regions of the human body in all views Identify normal skeletal features visualized in x-rays of all regions</li> <li>• Enumerate different contrast X- rays;</li> <li>• Identifying anatomical basis of their interpretation</li> <li>• Read a normal CT &amp; MRI film of all the sections of the human body with identification of anatomical structures.</li> <li>• Identify different anatomical structures through ultrasound</li> <li>• Describe different basic radiological techniques</li> </ul>	45 days
	<b>Posted in Orthopaedics:</b> <ul style="list-style-type: none"> <li>• Apply the knowledge of anatomy in orthopaedic setting and Function as a clinical anatomist</li> <li>• Ascertain relevance of anatomical basis in routine operative procedures</li> </ul>	7 days
	<b>Posted in ENT</b> <ul style="list-style-type: none"> <li>• Apply anatomical knowledge and identify different structures encountered in operative or clinical procedures including endoscopy</li> </ul>	7 days



	<p><b>Posted in Forensic Medicine &amp; Toxicology</b></p> <ul style="list-style-type: none"> <li>• Application of knowledge of Anatomy with forensic techniques to determine the identity of human remains and medico legal aspects pertaining to Anatomy</li> </ul>	30 days
	<p><b>Posted in Anaesthesia</b></p> <ul style="list-style-type: none"> <li>• Application of Anatomy in Anaesthesia and Intensive care</li> <li>• Well trained in Basic Life Support</li> </ul>	7 days
Laboratory skills	<ul style="list-style-type: none"> <li>• Should assist and guide first year MBBS students in the dissections of the cadaver.</li> <li>• Should assist and guide in identification of general &amp; systemic histology slides of various tissues and organs for MBBS students</li> <li>• Should acquire and acquaint the knowledge of various types of microscopes their configuration and applications.</li> <li>• Should acquaint him/herself with and necessary training in computer operations for data retrieval and power point presentations etc. for teaching &amp; research.</li> </ul>	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.	2 hrs/week

## II year of Post-Graduation:

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/evaluation process of Periodic Notified Test conducted for the first year MBBS students – both in theory and practical including viva voce.	
Learning	<p><b>Posted in Surgery</b></p> <ul style="list-style-type: none"> <li>• Function as a clinical anatomist with a surgical team during planning of common</li> </ul>	15 days



	<p>general surgical procedures involving viscera and bodily regions such as - hernia, hydrocele, varicose veins, appendix, gall bladder, stomach, rectum, prostate, breast, chest wall etc.</p> <ul style="list-style-type: none"> <li>Identify anatomical structures in endoscopic view</li> </ul>	
	<p><b>Posted in O&amp;G-</b></p> <ul style="list-style-type: none"> <li>Have a logical review of clinical examination, procedures and planning part of operative interventions</li> <li>Develop inquisitiveness to explore possible justification of developmental defects in babies or gestational tissues</li> </ul>	7 days
	<p><b>Posted in Paediatric Surgery:</b></p> <ul style="list-style-type: none"> <li>Apply and comprehend the embryological basis of congenital anomaly correction surgeries</li> </ul>	7 days
	Communication skills and knowledge through seminars and journal clubs	
Laboratory skills	<ul style="list-style-type: none"> <li>Embalming of cadavers of all types</li> <li>Tissue processing viz. fixation, dehydration, clearing and embedding</li> <li>Staining – routine H &amp; E staining and special staining for epithelium, connective tissue, muscle, gland &amp; nervous tissue</li> <li>Museum technique – mounting of specimens for museum both wet and dry, making of various type of models, injection corrosion cast &amp; plastination techniques.</li> <li>Cytogenetics techniques – cell culture, harvesting and processing blood samples for karyotyping; Various type of banding techniques; Automated karyotyping using software</li> </ul>	
Research	<ul style="list-style-type: none"> <li>Maintenance of work book/log book pertaining to dissertation work undertaken and the same to be documented in electronic format.</li> <li>Discussion with Supervisor/Guides &amp; Co guides</li> </ul>	2 hrs/week



### III year of Post-Graduation:

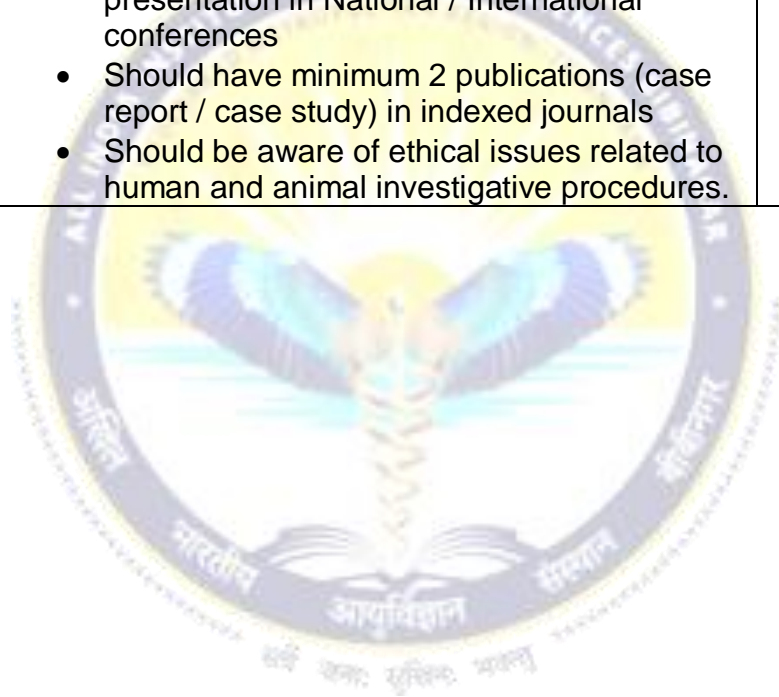
Teaching	Should get involved in teaching of Gross Anatomy/applied to first year MBBS students during dissection hours on all working days	12 hrs /week
	Should get involved in small group teaching session – teaching of bones and microscopic slides of histology – demonstration classes	Osteology 4hrs/week Histology 4hrs/week
	<ul style="list-style-type: none"> <li>• Should be involved in correction work/evaluation process of Periodic Notified Test conducted for the first year MBBS students – both in theory and practical including viva voce.</li> <li>• Formulating OSPE</li> <li>• Question paper setting</li> <li>• Preparing teaching modules</li> <li>• Organizational training – planning integrated seminars for undergraduates</li> </ul>	
	Should be involved in organizing/delivering lectures for first year MBBS students on selected topics of interest in Gross Anatomy, Human Embryology & Medical Genetics	12 hrs /week
Learning	<b>Posted in Vascular and Cardio-Thoracic Surgery</b> <ul style="list-style-type: none"> <li>• Comprehend the anatomical basis of microsurgeries</li> </ul>	7 days
	<b>Posted in Neurosurgery</b> <ul style="list-style-type: none"> <li>• Comprehend the anatomical basis of neuro surgical intervention</li> </ul>	7 days
	<b>Posted in Plastic Surgery:</b> <ul style="list-style-type: none"> <li>• Apply and comprehend the anatomical basis of plastic surgical principles of skin flap, muscle flap and vascular pedicle-based reconstructions</li> </ul>	7 days
	<b>Posted in Urology</b> <ul style="list-style-type: none"> <li>• Comprehend anatomical basis of urological procedures</li> </ul>	7 days
	Should obtain the necessary skills in delivering lectures through computer assisted teaching	
Laboratory skills	<ul style="list-style-type: none"> <li>• Minimum should have embalmed five cadavers</li> </ul>	



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	<ul style="list-style-type: none"><li>• Should submit routine and special stain slides of minimum number of five for each tissue</li><li>• Should submit at least one model of the museum techniques described earlier</li></ul>	
Research	<ul style="list-style-type: none"><li>• Analyze the data of dissertation work and present it comprehensively in the required format</li><li>• Should attend and present the work done on dissertation in Scientific bodies – either in the regional or at national conferences.</li><li>• At the end of the third year, the candidate should have published the data of his/her dissertation work in an indexed journal.</li><li>• Should have minimum 2 paper / poster presentation in National / International conferences</li><li>• Should have minimum 2 publications (case report / case study) in indexed journals</li><li>• Should be aware of ethical issues related to human and animal investigative procedures.</li></ul>	2 hrs/week





## Assessment

### Monthly assessment Schedule:

Candidate will be assessed for the monthly learned activities on the fourth Saturday of every month.

Mode of assessment: Theory / Practical / Viva / Seminar

Total marks: 50

### Formative assessment Schedule:

Candidate should secure a minimum of 50% marks in Theory and Practical separately, in order to be eligible to appear for Professional Examination. Formative assessment will have following schedule and marks distribution criteria:

#### Theory:

Period	Paper/s	Total marks	Minimum Pass % to qualify
At the end of I year	1 paper	100	$\geq 50\%$
At the end of II year	1 paper	100	$\geq 50\%$
Pre-Professional	4 papers of 100 marks each	400	Overall $\geq 50\%$ ; individual papers $\geq 40\%$
	<b>Grand total</b>	<b>600</b>	<b><math>\geq 50\%</math></b>

#### Practicals:

Period	Total marks	Pattern
At the end of I year	100	Practicals
At the end of II year	100	Practicals
Pre-Professional	400	Practicals (300) and Grand viva (100)
<b>Grand total</b>	<b>600</b>	<b><math>\geq 50\%</math> (Minimum pass %)</b>





## Summative Assessment:

The post graduate summative examination will consist of three components

- Submission of Thesis work
- Theory examination
- Practical examination

A	Theory	4 Papers each of 100 Marks = 400 Marks	Minimum 40% marks in each paper and aggregate of 50% in order to be declared pass
B	Practical	Practical 300 + Viva 100 = 400 Marks	Aggregate of 50% in order to be declared pass

## Final result:

(A) Theory – 400 Marks; (Minimum 40% marks in each paper and aggregate of 50% in order to be declared pass)

(B) Practical – 400 Marks; Minimum 50% marks required in Theory & Practical separately, in order to be declared successful at MD/MS Examination.

## Theory Examination:

It has 4 papers

**Paper – I:** Gross Anatomy with evolution, functional Anatomy, Comparative Anatomy, Imaging Anatomy and Diagnostics.

**Paper – II:** Histology, Histochemistry & histological Techniques, Developmental Anatomy and Genetics, embalming techniques, dissection and museum techniques

**Paper – III:** Neuroanatomy including development and microscopic structure

**Paper – IV:** Applied Anatomy and Recent Advances



Each paper will be for three hours duration and **100 marks**.

Types of questions	Number of questions	Marks for each question	Total
MCQ	40	0.5	20
Long Essay questions	8	10	80

### Practical Examination:

	Topic	Marks
Day 1	Dissection & related Viva voce	100
	Histology and histotechniques and related Viva voce	100
	Neuroanatomy slide discussion	50
	Embryology slide discussion	50
	<b>Total</b>	<b>300</b>

	Grand Viva	Marks
Day 2	Dissected body/Parts & Organs	30
	Bones & Joints	15
	Embryology Specimens & Models	10
	Surface Anatomy	5
	Radiological Anatomy (X rays, MRI & CT)	5
	Anthropometry	5
	Viva-Voce on Dissertation = 15 Minutes.	15
	Pedagogy – Micro Teaching	15
	<b>Total</b>	<b>100</b>



## Postings

### General Objective of Posting:

- To develop integrated approach in learning
- Applying logic of anatomical basis in clinical examination and procedures
- To incorporate the learning experience of postings in conceptual learning and research
- To realise being an integral part of the whole system of Medical Science for the service of mankind

Departments	Duration	Academic term
CM&FM	30 days	1
Radiology	45 days	1
Orthopaedics	7 days	1
ENT	7 days	1
Anaesthesia	7 days	1
Forensic Medicine & Toxicology	30 days	1
Surgery	15 days	2
O&G	7 days	2
Paediatric surgery	7 days	2
Vascular & cardiothoracic surgery	7 days	3
Plastic surgery	7 days	3
Neurosurgery	7 days	3
Urology	7 days	3

In 45 days posting in Radio-diagnosis of, the break up of posting will be as follows

- 20 days: in x-ray unit (plain and special procedures)
- 10 days: in ultrasound
- 15 days: CT and MRI



## Research activities

### Thesis / dissertation:

Every candidate shall carry out work on an assigned research project under the guidance of a recognised Post Graduate Teacher, the result of which shall be written up and submitted in the form of a Thesis. Thesis shall be submitted at least six months before the Theory and Clinical / Practical examination. The thesis shall be examined by a minimum of three examiners; one internal and two external examiners, who shall not be the examiners for Theory and Clinical 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.

### Objectives

1. The student would be able to demonstrate capability in research by planning and conducting systematic scientific inquiry & data analysis and deriving conclusion.
2. Communicate scientific information for health planning.

### Guide for thesis:

1. Chief guide will be from the concerned department.
2. Co-guide will be from the department or from other disciplines related to the thesis.

### Submission of thesis protocol:

It should be submitted at the end of six months after admission to the course.

- 1) Protocol in essence should consist of: a) Introduction and objectives of the research project. b) Brief review of literature c) Suggested materials and methods, and (scheme of work) d) Statistician should be consulted at the time of selection of groups, number of cases and method of study. He should also be consulted during the study. e) Bibliography
- 2) The protocol must be presented in the concerned department before being forwarded to the Research Committee of the Institute.
- 3) Protocol will be approved by the research committee appointed by the Dean / Principal to scrutinise the thesis protocol with reference to its feasibility, statistical validity, ethical (human/animal) aspects, etc.

### Submission of thesis

1. The thesis shall relate to the candidate's own work on a specific research problem or a series of clinical case studies in accordance with the approved plan.



2. The thesis shall be written in English, printed or typed double line spacing, on white bond paper 22x28 cm with a margin of 3.5 cm, bearing the matter on one side of paper only and neatly bound with the title, the name of the Institute printed on the front cover.

3. The thesis shall contain: Introduction, review of literature, material and methods, observations, discussion, conclusion and summary and reference as per Vancouver style

### Journal club:

A journal club is an educational meeting in which all faculties and residents of the department gather and discuss published articles, to keep themselves abreast of new knowledge, promoting in them the awareness of current research findings, teaching them to critique and appraise research, and encourage them to utilize research in evidence based practice of the speciality. Choosing the journal club articles, assessing them and presenting them in the journal club meeting are all of vital importance and as a trainee advances in his training he/she is expected to imbibe the best from his seniors and peers in the club

### Seminars:

It employs research process, including hypothesis generation, experimental rationale, and measurement and interpretation. Report on scientific proposals, data, and research activity outcomes. Explain key scientific concepts in presentations, and adapt messages to different audiences. Thereby, it contributes to

- Analysing complex scientific issues
- Identifying critical and essential factors from a large body of information
- Making a constructive critique of a scientific presentation
- Performing written and oral communication skills at a high standard
- Contributing to intellectual discussion
- Generating new ideas for scientific experiments

### Embalming:

The process of chemically treating the dead human body to reduce the presence and growth of microorganisms, to retard organic decomposition and to restore an acceptable physical appearance. The Post-Graduate is trained in all types of embalming and should have assisted a minimum of three embalming and embalmed a minimum of five cadavers independently before appearing for the professional examination.



## Foetal autopsy:

During the 30 days posting in Forensic Medicine, the Post Graduate is expected to witness and make a record of foetal autopsy and the difference in the adult and paediatric anatomy

## Karyotyping:

The Post Graduate should have trained in the Cytogenetics techniques - cell culture, harvesting and processing of blood samples for karyotyping; Various type of banding techniques; Automated karyotyping using software before appearing for the professional exam





## Future scope of a qualified PG after completion of the course

A qualified Post Graduate in Anatomy has wide global career opportunities

- Could be a faculty in various medical colleges and Dental colleges
- An Anatomist has a tremendous scope in CT and MRI centres by virtue of his / her knowledge in Radiological Anatomy
- Knowledge of Genetics gives an Anatomist greater opportunities in Genetics labs which are upcoming fastly in the field of medicine for diagnosis and treatment
- The knowledge of Embryology offers enough opportunities in the field of infertility and IVF centres
- An anatomist by virtue of his knowledge about the whole human body (both gross and microscopic) can have a place in the field of Medical jurisprudence and criminology
- Excellent scope in research. Anatomists with their distinct discoveries contribute to important advances in science or medicine.

