

**H.P GUIDELINES FOR COMPETENCY BASED**  
**POST GRADUATE TRAINING PROGRAMME**  
**FOR MD – ANATOMY**

**Preamble**

The purpose of this programme is to standardize Anatomy teaching at Post Graduate level through out the country so that it will benefit in achieving uniformity in undergraduate teaching as well. Accordingly the training in MD-Anatomy should be distinctive from that in MSc, PhD Anatomy where the approach to the subject is primarily experimental.

**Programme Objectives**

A candidate upon successfully qualifying in the MD Anatomy examination should be able to:

1. Be a competent Anatomist.
2. Teach the undergraduate student Gross Anatomy, radiological Anatomy, Embryology, Histology, Neuroanatomy and elementary genetics.
3. Assess the students understanding of the Anatomical sciences.
4. Assess the undergraduate programmes.
5. Plan and modify the undergraduate curriculum.
6. Prepare the tissues for light microscopic study.
7. Enumerate the types of microscopes, their uses and their principles including electron microscope. Take care of maintenance of microscopes.
8. Embalm a cadaver.
9. Design Gross Anatomy and Histology laboratories for teaching undergraduate and postgraduate students of Anatomy.
10. Plan and implement research programme.
11. Undertake Histomorphometric studies.

**Specific Learning Objectives:**

- a. Effectively teach undergraduate medical students the basic Anatomical mechanisms of human body with reference to their implication in the pathogenesis of disease and their management.
- b. Conduct such clinical and experimental research, as would have a significant bearing on human health and patients care.

- c. Encourage interaction with the allied Departments by rendering services in advanced laboratory investigation and relevant expert opinion.
- d. Demonstration in the allied departments, to acquire various skills for collaborative research.
- e. Uphold the prestige of the discipline amongst the fraternity of doctors.

### **Departmental Resources**

It be mandatory for the department to develop at least 3 of the following laboratories. In addition to the facilities, the laboratory should be involved in active research in one or more well defined fields.

- Cytogenetics
- Histochemistry
- Immunology
- Electronmicroscopy
- Developmental Anatomy
- Anthropometry
- Neuroanatomical Techniques
- Imaging technique for Radiological Anatomy

### **Post Graduate Training**

Based on the available facilities, department can prepare a list of post graduate experiments pertaining to basic and applied Anatomy. Active learning should form the main stay of post graduate training. There should be lecture for post graduate (at least 20 per year) along with seminars, symposia, group-discussions, Journal clubs. The post graduate students should regularly take the ward rounds of various Clinical departments and learn cases of interest for discussion with the Anatomy faculty. Each college should have a medical education unit to generate teaching resource material for UG and evolving of problem solving modules.

### **Post Graduate Examination**

The Post Graduate Examination shall be in three parts:-

1. Thesis, to be submitted by each candidate at least 6 months before the date of commencement of the theory examination.
2. Theory : there shall be four theory papers.

Paper 1 – Gross Anatomy including general Anatomy

Paper 2-. Embryology, Genetics and Histology

Paper 3- Neuro Anatomy

Paper 4- Applied Anatomy including Radiological anatomy and Recent Advances.

### **3. Practicals**

Should be spread over two days.

#### **First Day**

- a. Practical :     Gross Anatomy  
                          Dissection
- b. Practical :     Histology  
                          Spotting (10 spots )  
                          Techniques-section cutting from one block  
                          Staining one paraffin section

#### **Second Day**

- a. Microteaching
- b. Viva on dissertation and research methodology
- c. Grand viva including Radiological Anatomy, Surface Anatomy ,Living Anatomy and case/problem solving.

#### **Course Content:**

PAPER -1

#### **General Anatomy**

- Tissues of the body
- General Osteology
- Anthropology
- Muscle & fascia
- Nervous system
- Principles governing arterial, Venous and lymphatic pathways.
- Innervation of blood vessels.

#### **Gross Anatomy**

- Detailed Gross Anatomy of the human body including cross sectional Anatomy. Anatomical basis of clinical conditions.
- Embalming and museum techniques.

### **Radiological Anatomy**

- Principles involved in plain radiography.
- Special investigative procedures and newer imaging techniques such as ultrasound CT-scan, MRI, PET etc.

## **PAPER II**

### **Embryology**

#### General Embryology

- Special Embryology of all the systems of the body including variations and congenital anomalies.

### **Genetics**

- Structure of chromosomes.
- Structure of gene
- Karyotype
- Chromosomal aberrations
- Inheritance
- Basic Molecular genetics,
- Common Genetic disorders

### **Histology**

- Histological and Museum Techniques
- Microscope – All types
- Care and maintenance of light microscope
- General histology
- Special histology off the systems of the body including their electron microscopic appearance.

## **PAPER III**

### **Neuroanatomy**

- Structural organization of various parts of the nervous system with particular reference to their connection and functions.

- Localisation & effects of lesion in different parts of the central nervous system and nerve injuries.
- Neuroanatomical techniques for demonstration of Nissl substance, processes, myelin sheath.

## **PAPER IV**

### **Applied Anatomy including Radiological Anatomy and Recent Advances**

- a. Applied aspects of Human Anatomy including surgical approaches to various structure and organs
- b. Principles of Newer imaging Techniques
- c. Determination of age, sex, stature and race from skeletal remains.
- d. Determination of age of a living individual.
- e. Theoretical aspect of examination of Hair and Nail including difference between human and animal hairs.
- f. Application of Anatomical knowledge to fertility control.
- g. Immunological basis of tissue typing and organ transplant.
- h. Sectional Anatomy
- i. Principles and Interpretation of CTScan, Sono graphy and MRI.
- j. Surface Anatomy
- k. Principles of Physical Anthropology
- l. Museum Techniques.
- m. Embalming Techniques including medico-legal aspects.

### **Recommended Reading**

- Medical Embryology- Jan Langman
- Human Embryology- Inderbeer Singh
- Genetics in Medicine- J.S Thompson & M.W Thompson
- Research how to plan, speak & write about it- C. Hawkins & M Sorgi
- How to write & publish a scientific paper – R.A Day
- Human Embryology- W.J Hamilton & H. W. Mossman
- An introduction to Biostatistics. A manual for students in health science –P.S.S. Sunder Roa

- Gray's Anatomy
- Anatomy- Regional & Applied-R.J Last
- Clinical Neuroanatomy- Snell
- Anatomy for Surgeon- W.H Hollinshead Vol 1, II & III
- Tissues of the Human body by Le Gros Clerk
- Human Nervous System-Murray Barr, John Kieman
- A synopsis of Surgical Anatomy—D.J.Du Plessis
- Frazers's Osteology
- Text Book of Histology –Bloom and Fawcett
- Carleton's Histological Techniques
- Ham's Histology

### **Journals**

- Journal of Anatomical Society of India
- Journal of Anatomy, London
- Anatomical Record
- American Journal of Anatomy
- Clinical Adjuncts
- Anatomical Adjuncts

Cell, Tissues & Organs (Formely Acta Anatomica)

## **CURRICULUM**

Postgraduate curriculum shall include the entire undergraduate curriculum as with modifications as under-

Level 1 & 2 U.G curriculum will become level 1 of P.G curriculum will include current trend and recent advances in the concerned topic and historical aspects.

### **First Year of Residency:**

1. A student should complete – Gross anatomy part with at least dissection of one body.
2. Should attend all U.G Lectures.
3. Part ending examination.
4. Collection of data and bibliography.
5. Submitting Protocol.
6. Completion of journal of Histology.
7. Clinical posting in Radiology

### **TEACHING**

1. Should be conversant with the use of various audio visual aids.
2. Presentation of Seminar/ journal club.
3. Presentation in seminars/CPC at the department and institutional level.
4. Should complete the subject of histology teaching.

### **Second Year of Residency-**

#### **Research & Thesis:**

Starting the work on thesis by the beginning of second year of residency with the aim to complete the data collection and analysis by the end of second year.

**Teaching:** From start of II<sup>nd</sup> year the P.G students in Anatomy should be capable of giving lectures for the entire batch of students.

Start teaching embryology and Genetics in small group after microteaching Sessions.

Should be conversant with the use of various audio visual aids.

Presentation in Journal club.

Presentation in seminars/Symposia/ CPC at the departmental and institutional level.

**Third Year of Residency-**

**Research :**

- i. Completion of Dissertation.
- ii. Presentation of paper in conference (optional but desirable)
- iii. Writing articles for publication.

**Teaching :**

- i. Full fledged lectures, lecture-demonstration, small group teaching.
- ii. Seminars/ Symposia.
- iii. Journal Club.
- iv. Teaching of Neuro Anatomy.

**Dissection –**

Exercise in window- dissection of various regions.



# PG TIME TABLE

<b>June to July</b>	<b>Teaching with UG classes</b> <b>General Anatomy</b> <b>Upper limb</b> <b>Preparation of Protocol for Thesis</b>
<b>August onward for one year</b>	<b>Teaching with UG classes according to time table of UG</b> <b>Detail teaching of Histology to UG students</b> <b>Detail teaching of Osteology to UG students</b> <b>Detail teaching of Radiology to UG students</b>
<b>Seminar</b>	<b>Every 3<sup>rd</sup> Friday of month (12 pm – 1pm)</b>
<b>Journal club</b>	<b>Every 2<sup>nd</sup> Wednesday of month (2 pm – 3 pm)</b>

**Prof. & Head**

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