



YENEPOYA UNIVERSITY

Deralakatte, Mangalore - 575018

**REGULATIONS AND CURRICULUM GOVERNING
POSTGRADUATE PROGRAM (MD) IN
ANATOMY**

(CURRICULUM - EFFECTIVE FROM 2010-11)

ATTESTED

A handwritten signature in green ink, appearing to read 'kg', is written over the word 'ATTESTED'.

**Dr. Gangadhara Somayaji K.S.
Registrar
Yenepoya (Deemed to be University)
University Road, Deralakatte
Mangalore-575 018, Karnataka**



Office of the Registrar
University Road,
Deralakatte
Mangalore - 575018
Ph: 0824-2204667/68/69/71
Fax: 0824-2203943

Ref: No.YU/REG/ACA/4-ACM/2010

02.07.2010

NOTIFICATION

Sub: Curriculum for starting MD/MS in the departments of Anatomy,
Biochemistry, Physiology, Pharmacology, Microbiology,
and Forensic Medicine

Ref: Resolution of the Academic Council at its 4th Academic Council
meeting held on 02.07.2010, supplementary agenda - 1

The Academic Council at its 4th meeting and subsequently the Board of Management at its 11th meeting held on 02.07.2010 have resolved to approve the curriculum for starting the MD/MS in the departments of Anatomy, Biochemistry, Physiology, Pharmacology, Microbiology and Forensic Medicine.

This notification is issued for implementation with effect from the academic year 2010-2011.



REGISTRAR

To:

The Principal - YMC

Copy to:

1. Controller of Examinations
2. Academic Section

MD ANATOMY

I. Goal: The postgraduate, course M.D. (Anatomy) should enable a medical graduate to become a competent specialist, acquire knowledge and skills in educational technology for teaching medical, dental and health sciences and conduct research in bio-medical sciences.

II. Objectives:

At the end of the course, a Postgraduate in Anatomy shall be able to

1. Demonstrate comprehensive knowledge and understanding of gross and microscopic structure of human body and skills to demonstrate special dissection and histological and histochemical techniques.
2. Comprehend normal disposition, interrelationships. functional and applied anatomy of the various structures of the body.
3. Describe development of human body to provide an anatomical basis for understanding the structure and correlate with functions both in health and in disease presentations.
4. Demonstrate knowledge of basic and systemic embryology including genetic inheritance and sequential developments of organs and systems.
5. Recognize critical stages of development and the effects of common teratogens, genetic mutations and environmental hazards.
6. Explain development basis of major variations and abnormalities.
7. Aware of contemporary advances and developments in anatomy and related bio-medical field.
8. Demonstrate competence in basic concepts of research and acquire a spirit of enquiry in research.
9. Critically evaluate published research literature.
10. Recognize continuing educational needs and develop skills as a self-directed learner.
11. Select and use appropriate learning resources and teaching techniques as applicable for teaching and evaluation of medical and allied health science students.

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12. Carryout professional obligations ethically and in keeping with objectives of National Health Policy.
 13. Function as an effective member in health care, research and training.
 14. Exhibit interpersonal behavior in accordance with social norms and expectations.
 15. Acquire knowledge relating to latest non-invasive techniques like X-rays, CT Scan, MRI. Ultrasound and their interpretation in health and disease conditions
 16. Describe the methodology, techniques of embalming, preservation of cadavers and museum techniques, and perform the procedures.
 17. Describe and interpret Anatomy Act as in existence.

III. Outline of course contents

Theory

1. General Anatomy and Elements of Anatomy
2. Gross Human Anatomy including Cross Sectional Anatomy and Applied Anatomy
3. Principles of Microscopy and Histological techniques
4. General and Systemic Histology
5. General and Systemic Embryology including Growth, Development and Teratology
6. Neuro Anatomy.
7. Surface Anatomy.
8. Radiological Anatomy including Principles of newer techniques and Interpretation of CT Scan, Sonography and MRI.
9. Human genetics.
10. Principles of Physical Anthropology
11. Museum techniques, embalming techniques including Medico legal aspects, and knowledge of Anatomy.
12. Medical Ethics
13. Recent Advances in Anatomy.

Practical schedule

1. During the course - the PG students should dissect the entire human cadaver.
 2. They should embalm and maintain the record of embalming work done.
 3. They should prepare and mount at least 10 museum specimens.
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4. In Histology - Collection of tissues, fixing, block making, section cutting; use of different types of microtomes and preparation of general and systemic slides. Haematoxylin and Eosin stain preparation and staining technique. Knowledge of special staining techniques like Silver Nitrate, PAS staining, Osmium Tetroxide, Van Gieson etc. Embryo (Chick embryo) mounting, taking serial sections of embryo and staining with Haematoxylin & Eosin. Knowledge of light microscope and electron microscope. Detailed microscopic study of all the tissues (General and Systemic slides).

Method of Training:

The candidates shall attend all the Undergraduate Theory and Practical Classes regularly. Rotation postings of PG students shall be made in the II and III years of the course as follows:

1.	General Surgery	-	4 weeks	}	II year
2.	Orthopedics	-	2 weeks		
3.	Radio diagnosis	-	2 weeks		
1.	General Medicine	-	2 weeks	}	III year
2.	Pediatrics	-	2 weeks		
3.	Obstetrics & Gynecology	-	2 weeks		

At the end of the posting, a certificate has to be obtained from the concerned heads of the departments for satisfactory learning.

During three years of the course, the Postgraduate students shall take part in teaching undergraduate students in gross anatomy, histology, tutorials, group discussions and seminars.

IV. Seminars & Journal Review Meetings.

The postgraduate students should actively participate in departmental seminars and journal reviews. Inter departmental integrated seminars are conducted regularly. A record showing the involvement of the student shall be maintained. A diary should be maintained. Seminars journal review are suggested to be conducted alternately once in every 15 days.

V. Maintenance of Record of Work Done.

1. A diary showing each day/s work has to be maintained by the candidate, which shall be submitted to the head of the department for scrutiny on the first working day of the each month.
2. A practical record of work done in Histology and Gross Anatomy with an emphasis on Cross sectional Anatomy has to be maintained by the candidate and duly scrutinized and certified by the head of the department and to be submitted to the external examiner during the final examination.
3. A list of the seminars and journal clubs that have been attended and participated by the student has to be maintained which should be scrutinized by the head of the department.

VI. Periodical Assessment and Progress Report.

The post graduate students have to be assessed periodically by conducting written, practical and viva voce examination at the end of every year. The assessment should be based also on participation in seminars, journal review, performance in the teaching and use of teaching aids and progress in dissertation work. Checklists are given in chapter IV for the assessments.

The assessment will be done by all the recognized P.G. teachers of the department and the progress record should be maintained by the head of the department.

VII. Dissertation work.

During the course of study every candidate has to prepare a dissertation individually, on a selected topic under the direct guidance and supervision of a recognized postgraduate teacher as per MCI and Yenepoya University regulations.

The suggested time schedule for dissertation work is:

1. Preparation work for dissertation synopsis including pilot study and submission of the synopsis to the University within 6 months from the commencement of course or as per the dates notified by the University from time to time.
2. Data collection for dissertation and writing the dissertation.

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3. The candidates shall report the progress of the dissertation work to the concerned guide periodically and obtain clearance for the continuation of the dissertation work.
 4. Submission of the dissertation six months prior to the final examination or as per the dates notified by the University from time to time.

Registration of dissertation topic.

Every candidate shall submit a synopsis in the prescribed pro forma for registration of dissertation topic by the University after it is scrutinized by the PG training cum Research Committee of the concerned institution. The synopsis shall be sent to within the first 6 months from the commencement of the course or as notified by the University in the calendar of events, to the Registrar, Yenepoya University.

Submission of dissertation.

The dissertation shall be submitted to the Controller of Examination of the University six months prior to the final examination or as notified in the calendar of events. Approval of the dissertation by the panel of examiners is a prerequisite for a candidate to appeal for the University examination.

VIII. Scheme of Evaluation.

A. Theory - 400 marks

The written examination consists of four papers, with maximum marks of 100 for each paper. Each paper will be of three hours duration.

Each Theory paper consists of:

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|----|-----------------------|---|---------------|
| 1. | Long Essay Questions | - | 2x20=40 marks |
| 2. | Short Essay Questions | - | 6x10=60 marks |
| | Total | = | 100 marks |

Paper I:

- a. General and Elements of Anatomy
- b. Gross Anatomy with applied aspects
- c. Surgical anatomy

Paper - II:

- a. General & Systemic-Embryology including growth and development
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- b. Human Genetics and Teratology
 - c. Principles of Physical Anthropology

Paper - III:

- a. General & Systemic-Histology
- b. Principles of Microscopy and histological techniques
- c. Museum and embalming techniques including medico legal aspects

Paper - IV:

- a. Neuroanatomy
- b. Cross Sectional Anatomy, Radiological Anatomy & Newer Imaging Techniques
- c. Recent advances in Anatomy

B. Practicals - 200 marks Gross Anatomy - 100 marks, Histology - 100 marks

1) Gross Anatomy

To dissect in 3 hours and display for discussion the allotted dissection exercise on a human cadaver.

Distribution of Marks.

Surface anatomy	-	10
Dissection	-	40
Discussion	-	50
Total	-	100 marks

2) Histology

- 1. Identification and discussion of 10 stained sections which includes Neuroanatomy, Embryology and Human Genetics.

10x5=50 marks

- 2.
 - i. Taking serial sections from blocks provided - 10
 - ii. Staining of the given section with H & E and discussion - 20
30 marks
- 3. Discussion on Histological techniques 20 marks

Total
100 marks

C. Viva voce: 100 marks

1. This includes all the components of the syllabus along with specimens, skiagrams, including newer imaging techniques, bones and embryology models including a problem solving exercise and discussion on the dissertation topic submitted for the examination = 80 Marks
2. Pedagogy: Demonstration of teaching skill / techniques = 20 Marks

Maximum marks	Theory 400	Practical 200	Viva-voce 100	Total 700
M.D.(Anatomy) Examination				

IX. Recommended Books and Journals - Latest editions.

Gross Anatomy

1. Susan Standring. Gray's, Anatomy- 39th Edition, Elsevier 2005.
2. McMinn R.M.H. Last's, Anatomy - 8th Edition, ELBS, 1990.
3. Basmajain V. John and Slonecker E. Charles, Grants Method of Anatomy, 11th Edition, Williams and Wilkins 1939.
4. Hollinshed. W. Henry, Anatomy for Surgeon's - 4th Edition, Harper and Row Publishers, 1985.
5. Duplessis and Gadecker LecMcgiegor's, Synopsis of Surgical Anatomy - K.M.Varghese Company, 1986.
6. Snell. S. Richard, Clinical Anatomy for Medical Students - 5th Edition, Little Brown and Company, 1985.
7. Grant Boileau. J.C., An Atlas of Anatomy - 5th Edition, Williams and Willkins - 1984.
8. Graggs Hall E.C.B, Anatomy as a basis for Clinical Medicine - 2nd Edition. Williams and Willikins, 1990.

9. Mc Minn M.H.Robert, Mc Minn's Functional and Clinical Anatomy- Is'Edition.
Mosby Publications, 1995.

10. A.K.Datta, TextBook of Anatomy Vol. I, II &. III – 4th Edition, 1997 Current
Books International.

11. Le Gross Clark, Tissues of the Body – 6 th Edition, 1980 Oxford University Press.

12. Keith & Moore, Clinically Oriented Anatomy – 3rd Edition, 1992 Williams & Wilkins.

Histology

1. Connack.H.David, Ham's Text Book of Histology - 9lh Edition, J.B.Lippincott

Company, 1987.

2. Copenhaver M. Wilfred etal. Bailey's text book of Histology, 17"" Edition,
William and Wilkins, 1978. .

3. Difiore. S.H. Mariano, Atlas of Human Histoogy – 5th Edition, Lea Febiger
Publishers. 1985.

4. Jantiucira.C.Luis etal, Basic Histology - 2nd Edition, Large Medical Publication, 1971.

5. Dmry R.A.B., Wullington E.A. Carlion's. .Histological Technique - 5"1 Edition,
Oxford University, Preces, 1980.

6. Cullings, Histological Technique - 3rd Edition, 1994 Butterwoiths.

7. John D Bancroft, Manual of Histological Technique - 1st Edition, 1984 Churchil
Livingstrone.

8. Michael H Ross, Histology - A Text & Atlas - 3"1 Edition. 1985 Williams & Wilkins.

9. Bloom and Fawcett, Text Book of Histology. W.B.Saunder's Company.

Embryology

1. Hamilton W.J. and Mossman H.W., Human Embryology - 4lh Edition, Williams
and Wilkins Company, 1972.

2. Sadler T.W., Langman's Medical Embryology - 7lh Edition, Williams and
Wilkins Company 1995.

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3. A.K.Datta. Essentials of Human Anatomy, Human Embryology - 21st Edition, Current Books International, 1991.
 4. Moore Persaud, The Developing Human - 7th Edition, Eisevier 2003.
 5. Larsen, Human Embryology - 2nd Edition, 1997, Churchil Livingstone
 6. Langman, Medical embryology T W Sadur - 9th edition 2004, Lippincott, Wililiams & Wilkins.

Neuro Anatomy

1. Everett N.B., Functinal Neuroanatomy, 6th Edition, Lee and Febigger, 1971.
2. Chusid. G.Joseph, Correlative Neuroanatomy and Functional Neurology – 16th Edition, Lange Medical Publication, 1976.
3. A.K.Datta, Neuroanatomy, - 1st Edition, Current Books International, 1997.
4. Snell.S.Richard, Clinical Neuroanatomy for Medical Students, - 4th Edition, Lippincott - Raven, 1982.
5. Parent Andre, Carpenter's Neuroanatomy - 9th Edition, Williams and Wilkins, 1996.
6. Inderbir Singh, Neuroanatomy - 5th Edition. 1997 Jaypee Brothers Medical Publications

Human Genetics / Medical Genetics

1. Robert F Mueller, Emery's Elements of Medical Genetics - 9th Edition, 1995 Churchil Livingstone.
2. Nora & Frazer, Medical Genetics Principles - 1974 Lee & Gebiger. Philadelphia.
3. Friedman, NMS Genetics - 2nd Edition, 1996.
4. Alfred G Kudson Jr.. Genetics & Disease - Me Graw Hill Book Company N.Y.,
5. Thomas D. Gelehrtar, Principles of Medical Genetics - 2nd Edition, 1990 Williams & Wilkins.
6. J.M.Conner M A Ferguson Smith - Essentials of Medical Genetics - Blackwell Scientific publications.

Physical Anthropology

1. Harrision, Human Biology an introduction to Human Evolution and Growth - 2nd Edition,1970.
2. Poirie. Fossil Man, 1973.

Embalming Techniques

1. Jayavelu T., Embalming Techniques, Churchil Livingston.
2. Ansari M.C., Embalming.
3. Embalming - Ajmani 1st edition 1998, J.P.Publishers.

Museum Techniques

1. Tompsett RH, Anatomical Techniques.
2. Edwards JJ, Medical Museum Techniques. Oxford University Press

Journals

1. Journal of Anatomical Society of India.
2. Journal of Anatomy.
3. Acta Anatomica.
4. American Journal of Anatomy.
5. American Journal of Physical Anthropology.
6. Journal of Morphology. Embryology
7. Anatomical Record
8. Americal Journal of Medical Genetics.
9. Annual Review of Genetics