M.D. 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.
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 behaviour 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. History of Anatomy.
2. General Anatomy.
3. Elements of Anatomy.
4. Gross Human Anatomy including Cross Sectional Anatomy and Applied Anatomy.
5. Principles of Microscopy and Histological techniques.
6. General and Systemic Histology
7. General, and Systemic Embryology including Growth, Development and Teratology.
8. Neuro Anatomy.
9. Surface Anatomy.
10. Radiological Anatomy including Principles of newer techniques and Interpretation of CT Scan, Sonography and MRI.
11. Human genetics.
12. Comparative Anatomy.
13. Principles of Physical Anthropology.
14. Museum techniques, embalming techniques including Medico legal aspects, and knowledge of Anatomy Act.
15. Medical Ethics.
16. 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.

4. In Histology section

- Collection of tissues, fixing, block making, section cutting; use of different types of microtomes and preparation of general and systemic slides.
- Haematoxylin & Eosin -

  (i) Preparation of stains.

  (ii) Staining techniques.
- Knowledge of special staining techniques like Silver Nitrate, PAS staining, Osmium Tetroxide, Van Gieson etc.
- Embryo (Chick embryo) mounting and serial sections of embryo - should be taken, stained with Haematoxyline & Eosin.
- Knowledge of light microscope and electron microscope.
- Detailed microscopic study of all the tissues (General and Systemic slides).

III. 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.	Orthopaedics	-	2 weeks	
3.	Radiodiagnosis	-	2 weeks	
1.	General Medicine	-	2 weeks	III year
2.	Paediatrics	-	2 weeks	
3.	Obstetrics and Gynaecology	-	2 weeks	
4.	Genetics	-	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. 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.

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 RGUHS 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.

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 proforma 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 (Academic). For details see chapter 1, sl no 9.

Submission of dissertation

The dissertation shall be submitted to the Registrar (Evaluation) 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 appear for the University examination. (For further details see sl.no. 9 in Chapter 1).

IX. 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:

1. Long Essay Questions	- 2 X 20	=	40 marks
2. Short Essay Questions	- 6 X 10	=	60 marks
	Total	=	100 marks

Paper -I:

a. History of Anatomy

b. General and Elements of Anatomy

c. Gross Anatomy with applied aspects

Paper - II:

a. General & Systemic-Embryology including growth, development and Teratology

b. Comparative Anatomy.
c. Principles of Physical Anthropology.

Paper - III:

a. General & Systemic - Histology and Principles of Microscopy
b. Histological, museum and embalming techniques including medico legal aspects
c. Human Genetics.

Paper - IV:

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

Questions on recent advances may be asked in any or all papers *

The topics assigned to the different papers are given as general guidelines. A strict division of subjects may not be possible. Some overlapping of topics is inevitable. Students should be prepared to answer the overlapping topics.

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

i) 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

ii) Histology

1. Identification and discussion of 10 stained sections which includes Neuroanatomy, Embryology and Human Genetics. 10 X 4 = 40 marks

2. i) Preparation of a paraffin block - 10
   ii) Taking serial sections from blocks provided - 10 — 40 marks
   iii) Staining of the given section with H& E and discussion 20
   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 M.D.(Anatomy) Examination	Theory 400	Practicals 200	Viva-voce 100	Total 700

X. 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 1989.
4. Hollinshed.W.Henry, Anatomy for Surgeon's - 4th Edition, Harper and Raw Publishers, 1985.
5. DUPLESSIS and Gadecker Lee Mcgregor's, Synopsis of Surgical Anatomy - 12th Edition, 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 Williams, 1990.
9. Mc Minn M.H.Robert, Mc Minn's Functional and Clinical Anatomy - 1st 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 - 6th Edition, 1980 Oxford University Press.
12. Keith & Moore, Clinically Oriented Anatomy - 3rd Edition, 1992 Williams & Wilkins.

Histology

1. Cormack.H.David, Ham's Text Book of Histology - 9th Edition, J.B.Lippincott Company, 1987.
2. Copenhaver M. Wilfred etal, Bailey's text book of Histology, 17th Edition, William and Wilkins, 1978.
3. Difiore. S.H. Mariano, Atlas of Human Histoogy - 5th Edition, Lea Febiger Publishers, 1985.
4. Janqueira.C.Luis etal, Basic Histology - 2nd Edition, Large Medical Publication, 1971.
5. Drury R.A.B., Wallington E.A. Carlton's, Histological Technique - 5th Edition, Oxford University, Preces, 1980.
6. Cullings, Histological Technique - 3rd Edition, 1994 Butterworths.
7. John D Bancroft, Manual of Histological Technique - Ist Edition, 1984 Churchil Livingstrone.
8. Michael H Ross, Histology - A Text & Atlas - 3rd 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 - 4th Edition, Williams and Wilkins Company, 1972.
2. Sadler T.W., Langman's Medical Embryology - 7th Edition, Williams and Wilkins Company 1995.
3. A.K.Datta, Essentials of Human Anatomy, Human Embrylogy - 2nd Edition, Current Books International, 1991.
4. Moore Persaud, The Developing Human - 7th Edition, Elsevier 2003.

5. Larsen, Human Embryology - 2nd Edition, 1997, Churchil Livingstone.
6. Langman, Medical embryology T W Sadur - 9th edition 2004, Lippincott, Willliams & Willkins.

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 Jaypeee Brothers Medical Publications.

Human Genetics / Medical Genetics

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

Comparative Anatomy

1. Banks Histology and Comparative Organology - A Text & Atlas - Edition 1974.
2. Wolstenhome, Taste & Smell in Vertebrates - Edition 1970.
3. Embryogenesis in Mammals CIBA foundation - Edition 1976.
4. George C. Kent, Comparative Anatomy of the Vertebrtes - 3rd Edition, 1983 Mc. Graw

Hill Book Company.

5. Romer, Vertbrate Body - 5th Edition, 1978, V.B. Saunders Company.

Physical Antropology

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.

ADDITIONAL READING

1. Compendium of recommendations of various committees on Health and Development (1943-1975). DGHS, 1985 Central Bureau of Health Intelligence, Directorate General of Health Services, Ministry. of Health and Family Welfare, Govt. of India, Nirman Bhawan, New Delhi.
2. National Health Policy, Ministry. of Health & Family Welare, Nirman Bhawan, New Delhi , 1983.
3. Santosh Kumar, The elements of Research, writing and editing 1994, Dept. of Urology, JIPMER, Pondicherry.
4. Srinivasa D.K etal, Medical Education Principles and Practice, 1995. National Teacher Training Centre, JIPMER, Pondicherry.
5. Indian Council of Medical Research, "Policy Statement of Ethical considerations involved in Research on Human Subjects", 1982, I.C.M.R., New Delhi.
6. Code of Medical Ethics framed under section 33 of the Indian Medical Council Act, 1956. Medical Council of India, Kotla Road, New Delhi.
7. Francis C.M, Medical Ethics, J P Pulications, IIed. 2004.
8. Indian National Science Academy, Guidelines for care and use of animals in Scientific Research, New Delhi, 1994.
9. International Committee of Medical Journal Editors, Uniform requirements for manuscripts submitted to biomedical journals, N Engl J Med 1991.
10. Kirkwood B R, Essentials of Medical Statistics, 1st Ed., Oxford: Blackwell Scientific Publications 1988.
11. Mahajan B K. Methods in Bio statistics for medical students, 5th Ed. New Delhi, Jaypee Brothers Medical Publishers, 1989.
12. Raveendran, B Gitanjali, A Practical approach to PG dissertation, New Delhi JP Publications, 1998.

SRI SIDDHARTHA UNIVERSITY

M.D. Degree Examination - May 2010

[Time: 3 Hours] [Max. Marks: 100]

ANATOMY

GROSS ANATOMY, GENERAL ANATOMY, HISTORY OF ANATOMY

PAPER – I

Q.P. CODE :

Your answers should be specific to the questions asked.
Draw neat labeled diagrams wherever necessary. Answer all questions

LONG ESSAY **2 X 20 = 40 Marks**

1. Describe the anatomy of soft palate and discuss the mechanism of deglutition

2. Describe the peculiarities of dural venous sinuses. Describe the cavernous sinus in detail

SHORT ESSAY **6 X 10 = 60 Marks**

3. Atlanto Axial Joints

4. Epiphyseal cartilage

5. Portocaval anastomosis

6. Lymphatic drainage of thorax

7. Pelvic brim

8. Retinacula

* * * * *

SRI SIDDHARTHA UNIVERSITY

M.D. Degree Examination – Model Question Paper

[Time: 3 Hours] [Max. Marks: 100]

ANATOMY

PAPER – II

Q.P. CODE :

Your answers should be specific to the questions asked.
Draw neat labeled diagrams wherever necessary. Answer all questions

LONG ESSAY **2 X 20 = 40 Marks**

1. Describe the development of external genitalia. Add a note on their congenital anomalies
2. Describe final steps to modern man

SHORT ESSAY **6 X 10 = 60 Marks**

3. Describe the development of tongue and correlate it with its nerve supply
4. Describe physiological hernias with its congenital malformations
5. Write a note on twinning
6. Development of supra renal gland
7. Describe urachal fistula, cyst & sinus
8. Placentation in mammals

* * * * *

SRI SIDDHARTHA UNIVERSITY

M.D. Degree Examination – May 2010

[Time: 3 Hours] [Max. Marks: 100]

ANATOMY

PAPER – III

Q.P. CODE :

Your answers should be specific to the questions asked.
Draw neat labeled diagrams wherever necessary. Answer all questions

LONG ESSAY **2 X 20 = 40 Marks**

1. Discuss the role and significance of blood groups in genetics
2. Describe the microscopic structure of testis. Add a note on blood testis

SHORT ESSAY **6 X 10 = 60 Marks**

3. Genetic counseling
4. Plastination
5. Chromosomal studies in foetus
6. Supra vital stains
7. Body donation
8. Osteon

* * * * *

SRI SIDDHARTHA UNIVERSITY

M.D. Degree Examination – Model Question Paper

[Time: 3 Hours] [Max. Marks: 100]

ANATOMY

PAPER – IV

Q.P. CODE :

Your answers should be specific to the questions asked.
Draw neat labeled diagrams wherever necessary. Answer all questions

LONG ESSAY **2 X 20 = 40 Marks**

1. Describe in detail the limbic system
2. Describe the anatomical basis of neurological conditions associated with urinary bladder

SHORT ESSAY **6 X 10 = 60 Marks**

3. Give the surgical (Applied) anatomy of anal fissure
4. Write short notes on medial lemniscus
5. Describe the applied anatomy associated with various deformities of the foot
6. Write short notes on cholecystography
7. Write short notes on ultra sound
8. Draw and label the cross sectional anatomy at the level of L_1 vertebra

* * * * *