3) HUMAN ANATOMY

(i) Goal :

The broad goal of teaching anatomy to undergraduate students aims at providing comprehensive knowledge of the gross and microscopic structure and development of human body to provide basis for understanding the clinical correlation of organs or structures involved and the anatomical basis for the disease presentations.

(ii) Objectives:

A. Knowledge:

At the end of the course the student shall be able to

a) Comprehend the normal disposition, clinically relevant interrelationships, functional and cross sectional anatomy of the various structures in the body;
b) Identify the microscopic structure and correlate elementary ultrastructure of various organs and tissues and correlate the structure with the functions as a prerequisite for understanding the altered state in various disease processes;
c) Comprehend the basic structure and connections of the central nervous system to analyse the integrative and regulative functions of the organs and systems. Locate the site of gross lesions according to the defects encountered;
d) Demonstrate knowledge of the basic principles and sequential development of the organs and systems, recognise the critical stages of the development and the effects of common teratogens, genetic mutations and environmental hazards. Understand the developmental basis of the major variations and abnormalities.

B. Skills :

At the end of the course the student shall be able to :

a) Identify and locate all the structures of the body and mark the topography of the living anatomy;
b) Identify the organs and tissues under the microscope;
c) Understand the principles of karyotyping and identify the gross congenital anomalies;
d) Understand principles of newer imaging techniques and interpretation of Computerised Tomography (CT) Scan, sonogram etc.
e) Understand clinical basis of some common clinical procedures i.e. intramuscular and intravenous injection, lumbar puncture kidney biopsy etc

C. Integration:

Integrated teaching of basis sciences with reference to clinical medicine.

An integrated teaching programs on Ethics and personality development has to be included to improve students discipline & Capabilities.

Topics for integrated teaching :

a) Femoral Sheath – femoral Hernia
b) Lymphatic drainage of Lower Limb
c) Inguinal Hernia
d) Ischio-rectal fossa
e) Extra Hepatic biliary apparatus
f) Porto-systemic Anastomoses
g) Diameters of the pelvis and its applied Anatomy
h) Supports of Uterus
i) Thyroid Gland
j) Mammary Gland
k) Fascial Spaces of Hand
l) Coronary Arteries
m) Stomach: Histological structure & functions of Gastric glands, Mechanism of secretion, gastric function tests – Hyperchlorthydia, Achorhydria.
n) Kidney: Structure of Nephron, functions of Nephron and Renal function tests.
o) Liver: Structure of Liver, formation and functions of Bile and Liver function tests.
p) Thyroid Gland – Structure; Synthesis and Metabolism of Thyroid Hormones and Thyroid function tests.
q) Adrenal gland: related disorders, structure, synthesis of Adrenal, Medullary hormones and their functions.

Note :-

1. A minimum of Five topics each, covering 2 hours are to be taught in a year. The Vice- principal(Academic) of the institution will be the co-ordenator for the integrated teaching programme.
2. Common topics suggested by Academic Senate (13 to 17), 2001 for integrated teaching in Biochemistry, Anatomy and Physiology:

Total (650) 1/3 didactic lecturer

(iii) Syllabus of Anatomy

Distribution of theory hours

No	Topics		Hours
1	Introduction		1
2	Descriptive Anatomy		1
3	General Anatomy		5
4	Embryology		42
	a) General Embryology (12)		
	b) Systemic Embryology (30)		
	I. Muscle, bone, skin, appendages and development of mammary gland	- 2	
	II. Cardio-Vascular system including heart	- 6	
	III. Lymphatic system	- 1	
	IV. Brachial Arches and Pouches	- 5	
	V. Gastro intestinal system and associated glands	- 6	
	VI. Development of face, palate & teeth	- 3	
	VII. Respiratory System	- 1	
	VIII. Genito Urinary system	- 6	
5	Histology		30
	c) General Histology (10)		
	d) Systemic Histology (20)		
6	Neuro Anatomy		20
7	Human Genetics		10
	a) Introduction.		
	b) Mitosis and Meiosis		
	c) Normal Chromosomal pattern		
	d) Mutation		
	e) Culture of Chromosomes (Karyotyping)		
	f) Abnormalities of Chromosomes (Numerical & structure)		
	g) Linkage		
	h) Blood groups		
		Total	109

LECTURE DEMONSTRATIONS / GROUP DISCUSSIONS / TUTORIALS / SEMINARS

		Osteology	Soft parts	Hours
1	Upper Extremity	10	10	20
2	Lower Extremity	10	10	20
3	Head & Neck	15	25	40
4	Abdomen & Pelvis	4	21	25
5	Thorax	5	10	15
6	A maximum of two seminars of two hours duration for each semester.			8
			Total	128

IV) Practical should aim at familiarising student with Introduction:

Gross Anatomy of the whole body with more stress on location, position, surface anatomy and important relations of the various organs and other structures. Each student has to dissect whole human body ignoring minor details, which are not important clinically, and stressing more on applied aspect.

Distribution of Anatomy Practicals

		No. of practical	Hours
Dissection (Each practical class is of 2 hours duration 182X 2=364)			
1	Upper Extremity	25	50
2	Lower Extremity	25	50
3	Thorax	18	36
4	Head & Neck	45	90
5	Abdomen & Pelvis	44	88
6	Brain and spinal cord	25	50
Histology (Each practical class is of 2 hours duration 35 X 2 = 70)			
	General Histology	12	24
	Systemic Histology	23	46
Genetics			
	Practicals in Genetics	3	6

List of Histology Slides- General

1	Squamous Epithelium	15	Bone -LS
2	Cuboidal Epithelium	16	Plain Muscles
3	Columnar Epithelium	17	Skeletal Muscles
4	Pseudo stratified Epithelium	18	Cardiac Muscles
5	Ciliated Columnar Epithelium	19	Lymph gland
6	Ureter (Compound Epithelium)	20	Thymus
7	Oesophagus (Compound Epithelium)	21	Tonsil
8	Skin (Compound Epithelium)	22	Spleen
9	areolar connective tissue	23	Artery-Medium size
10	Adipose tissue	24	Aorta
11	Hyaline Cartilage	25	Vein-inferior vena cava
12	White fibro cartilage	26	Neuron - Multipolar
13	Elastic Cartilage	27	Peripheral nerve
14	Bone -TS		

List of Histology Slides - Systemic

1	Trachea	13	Ileum
2	Lung	14	Colon– Large Intestine
3	Serous Salivary Gland	15	Vermiform Appendix
4	Mucous Salivary Gland	16	Liver
5	Mixed Salivary Gland	17	Pancreas
6	Tongue	18	Gall bladder
7	Tooth	19	Kidney
8	Esophagus	20	Ureter
9	Stomach – Fundus	21	Urinary bladder
10	Stomach – Pylorus	22	Ovary
11	Duodenum	23	Fallopian tube
12	Jejunum	24	Uterus

25	Placenta	33	Supra-renal Gland
26	Mammary gland	34	Cerebrum
27	Testis	35	Cerebellum
28	Epididymis	36	Spinal cord
29	Vas deference	37	Cornea
30	Prostate	38	Retina
31	Thyroid	39	Skin
32	Hypophysis cerebri		

Practicals in Genetics
(Karyotyping of notmal male & female and some genetic disordersnand photographs)

1	Male Karyo typing	5	Klinefelter's Syndrome 47 – XXY
2	Female Karyo typing	6	Super Female 47 – XXX
3	Down's Syndrome – 21 Trisomy	7	Sex-Chromatin (Barr Body)
4	Turner's Syndrome 45 – XO		

Demarcation of Syllabus for University Exam between Paper I & Paper II

PAPER-I Portions :	**PAPER-II Portions :**
Upper Extremity	Lower Extremity
Head and Neck	Thorax , Abdomen, Pelvis
Brain and Spinal cord	Systemic Histology and Embryology
General Histology	Concerned with Thorax,
General Embryology	Abdomen & Pelvis
Systemic Embryology,	Genetics
concerned with Head & Neck and Brain.	General Anatomy.

Books Recommended:

1. Text book of Anatomy by T.S. Ranganathan
2. Embryology
   Langmann's Embryology
   IB Sing Embryology
   Reference Book – Embryology by A.K.Dalta.
3. Histology
   Difiories atlas of Histology,
   Asian Edition - BY Victor P. Eresanchko.
4. Dissection Manuals
   Cunningham's Dissection mannuals I, II & III
5. Gross Anatomy text book by A.K. Datta (3 vols) and text book by inderbir singh (3 vols)
6. Neuro Anatomy
   Clinical Neuro Anatomy
   by Vishnam Singh,
   I.B.Singh
   Refernce Book – A.K.Datta's Neuro Anatomy
   Text book

Reference books:

1. Gray's Anatomy.
2. Embryology by Hamilton & Mossman.