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SECTION - B
MUHS

CURRICULA I

1. PHASE-I (FIRST M.B.B.S.)

A) Introduction

As per the regulations on graduate medical education the M.B.B.S. course is divided in to phases – I, II, and III. During phase – I
every student shall undergo a period of study of pre-clinical subjects for two semesters. These subjects are

1 – Human Anatomy
2 – Physiology including bio-physics
3 – Biochemistry
4 – Introduction to community medicine including Humanity.

At the end of second term there will be Ist professional university examination.

B) Time distribution :- The first two semesters (approximately 240 teaching days) shall be occupied in the phase I (pre-clinical) subjects and introduction to a broader understanding of the perspectives of medical education leading to delivery of health care.

Following minimum teaching hours are prescribed in various disciplines for two semester

Anatomy	650 hours
Physiology	480 hours
Biochemistry	240 hours
Community Medicine	060 hours
Total	1430 hours

Didactic lectures should not exceed 1/3 of the time schedule, 2/3 schedule should include practicals and group discussions/ seminars / tutorials. Learning processes should include living experiences and problem oriented approaches. Passing in phase –I is compulsory before proceeding to phase-II training.

C) Attendance:

75% of attendance in a subject for appearing in the examination is compulsory provided he/she has 80% attendance in non lecture teaching. i.e. seminars, group discussions, tutorials, demonstrations and practicals.

Internal assessment:

i. Pattern of Examination for formative evaluation (internal assessment) first semester will have one (1) periodical short tests each carrying 25 marks each in Theory & practicals. There will be Terminal examination before the completion of 1 st Semester. The Terminal examination will include one theory paper of 60 marks & practical of 40 marks and viva 20 marks.

-Similarly second semester will have one (1) periodical short tests examination will be at the end of second Semester. It will have Theory 100 marks (2 papers of 50 marks each), Viva 20 marks & Practicals of 40 marks. Detail table is as follows..

ii. Internal Assessment- Total marks 40 (Theory 20 & practical 20)

University examination:

There shall be one main university examination in a year at the end of second semester in the subjects of Anatomy, Physiology and Biochemistry.

Distribution of Marks: As per the following table

Appendix - A

First M.B.B.S. Examination

SN	Subject	Theory /Oral / Practical/ Internal Assessment		Maximum marks in each part of the subject	Minimum marks required to pass in each part of the subject	Minimum marks required to pass in each subject
1	ANATOMY	a) Theory - Paper I		50	50	150
		- Paper II		50		
		b) Oral		20	--	
		c) Theory		100	60	
		d) Practical		40	20	
		e)Internal Assessment	Theory	20	20	
			Practical	20		
2	PHYSIOLOGY	a) Theory - Paper I		50	50	150
		- Paper II		50		
		b) Oral		20	--	
		c) Theory +Oral		120	60	
		d) Practical		40	20	
		e)Internal Assessment	Theory	20	20	
			Practical	20		
3	BIOCHEMISTRY	a) Theory - Paper I		50	50	150
		- Paper II		50		
		b) Oral		20	--	
		c) Theory +Oral		120	60	
		d) Practical		40	20	
		e)Internal Assessment	Theory	20	20	
			Practical	20		

In each of the subjects a candidate must obtain 50% in aggregate with a minimum 50% in theory, 50% in Theory+orals, 50% in practicals and 50% in Internal Assessment.

REVISED INTERNAL ASSESSMENT EXAMINATION SCHEME w.e.f. JUNE 2007 EXAMINATION

YEAR: - First MBBS

SN	Subject	1st Term End			Preliminary Examination		
		Semester	Theory	Practical	Semester	Theory	Practical
			(A)	(B)		(C)	(D)
1.	Anatomy	I	60	40	II	100	40
2.	Physiology	I	60	40	II	100	40
3.	Biochemistry	I	60	40	II	100	40

(B) Calculation Method:-

I) Theory Marks to be sent to the University out of 20 $= \frac{(A)+(C)}{8} = \frac{60+100}{8} = \frac{16}{8} = 20$

II) Practical Marks to be sent to the University out of 20 $= \frac{(B)+(D)}{4} = \frac{40+40}{4} = \frac{80}{4} = 20$

MODEL TIME TABLE

PHASE -.I

MODEL TIME- TABLE

(Subject to modification as per local situation)

First Semester :

Days Time	8-9	9-10	10-11	11-12	12-1	1-2	2-3	3-4
Mon	Anat.	Anat.	Anat.	Anat.	L	Phys-	Phys-	Phys-
Tues	Anat.	Anat.	Anat	Anat.	U	Phys	Phys -	Phys-
Wed	Anat.	Anat.	Anat.	Anat.	N	Bioch	- Bioch	Bioch-
Thurs	Anat.	Anat.	Anat.	Phy.	C	Phys-	Phys-	Phys-
Fri	Anat.	Anat,	Anat.	Bioc.	H	Bioch.	Bioch-	Bioch-
Sat	Anat.	Anat.	Anat.	Phys-		Phys-	Phys	Phys

Second Semester;

Days Time	8-9	9-10	10-11	11-12	12-1	1-2	2-3	3-4
Mon Anat	Phys.	Phys		Phys	Anat	L	Anat	Anat
Tues Anat.	Phys	Phys		Phys	Anat.	U	Anat.	Anat.
Wed Anat	Bioch	Bioch		Bioch	Bioch	N	Anat	Anat
Thurs Anat	Phys	Phys		Phys	Phys	C-	Anat	Anat
Fri Anat	Bioch	Bioch		Bioch	Anat	H	Anat	Anat
Sat	Phys	Phys		Phys	Phys	Anat	Anat	Anat

NOTE: Community Medicine lecture be arranged in consolation with other preclinical departments in the above things.

SUBJECTWISE SYLLABI:

HUMAN ANATOMY

(i)**Goal:**

The broad goal of the teaching of undergraduate students in Anatomy aims at providing comprehensive knowledge of the gross and microscopic structure and development of human body to provide a 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 pre requisite 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. He/she shall be able to locate the site of gross lesions according to the deficits encountered.
(d) Demonstrate knowledge of the basic principles and sequential development of the organs and systems, recognize the critical stages of development and the effects of common teratogens, genetic mutations and environmental hazards. He/she shall be able to explain 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 CT scan, sonogram etc.

(e) Understand clinical basis of some common clinical procedures i.e. intramuscular and intravenous injection, lumbar puncture and kidney biopsy etc.

C-Integration

From the integrated teaching of other basic sciences, student shall be able to comprehend and regulation and integration of the functions of the organs and systems in the body and thus interpret the anatomical basis of disease process.

(iii) Detail syllabus of Human Anatomy is given under following heads.

A) General Anatomy

B) Regional Anatomy

I - Upper limb

II - Lower limb

IIII - Abdomen

IV - Thorax

V - Head Face Neck

VI - Spinal Cord & Brain

C) Micro-Anatomy I - General Histology

II - Systemic Histology

D) Developmental Anatomy I - General Embryology

II - Systemic Embryology

E) Genetics

F) Radiological Anatomy, USG, CT, MRI

G) Surface Anatomy, Living Anatomy

H) University Exam pattern, Theory & Practical

I) Books recommended

Detail syllabus of Human Anatomy

A) GENERAL ANATOMY

I) DESCRIPTIVE TERMS

Terms used for describing the position of the body, Anatomical planes, Commonly used terms in Gross Anatomy, Terms used in Embryology, Terms related to limbs, for hollow organs, for solid organs, to indicate the side, for describing muscle, for describing movements

II) General Osteology

Definition, Nutrition & Morphological Classification, Distribution and Functions of bone Appendicular, Axial.

Diaphysis, Metaphysis, Epiphysis, Types of epiphysis

Primary centres, Secondary centers, Law of ossification, Epiphyseal plate, Blood supply of long bone

CARTILAGE

Definition, Types, structure, Distribution, Nutrition

III) General Arthrology

Classification, Synarthrosis, Amphiarthrosis, Diarthrosis.
Cartilaginous. Primary, Secondary

Synovial - Axis of movement, Structure of typical synovial joints

Classification of synovial joints, according to the shape ,axes of movement and morphology

Simple, Compound ,Complex joints,Blood supply & nerve supply.

IV) General Myology

Definition, types: Origin, Insertion, Morphological classification
Actions of muscles, nerve supply
Functional classification, Prime movers, Fixators, Antagonists, Synergists
BURSA, Structure, Functions,types:
LIGAMENTS, Types & functions,Sprains
RETINACULA & APONEUROSES

V) INTEGUMENT

a) Skin - Introduction : Surface area
Types :Thin, Thick, hairy, Functions, innervation
Structure :
Epidermis, Dermis, Appendages

b) SUPERFICIAL FASCIA
Distribution of fat, functions

c) DEEP FASCIA
Features, Modifications, Functions

VI) General Angiology

Arteries: Muscular, Elastic; Arterioles; Capillaries: Sinusoids, Veins - Anastomosis: End arterial; Vasa vasorum, nerve supply of blood vessels

Lymphatic system
Lymph vessels, Central lymphoid tissue, Peripheral lymphoid organs, Circulating lymphocytes - T and B lymphocytes

VII) General Neurology

Structure of nervous tissue,
Neurons:Synapses :Structural – type, Functional types
Classification of neurons : According to polarity and According to relative lengths of axons and dendrites:
Neuroglia:Nerves :Cranial – Spinal, Structure of typical spinal nerve
Autonomic nervous system :Sympathetic :Sympathetic ganglia, postganglionic fibres
Parasympathetic :Cranial outflow, sacral outflow

Level 2: Mechanical properties of bones.

synthesis, histogenesis, growth of Cartilage,Factors limiting range of movement,

Kinesiologically: Sellar, Ovoid, Joint position: Loose-packed, Close-packed
Number and diameter of fibres, Range of contraction, Active insufficiency,Passive insufficiency, shunt, swing, spin
Adventitious bursae - Housemaid's knee, Clergyman's knee, Student's elbow, Weaver's bottom, Porter's shoulder
Clinical correlation, significance of Langer's lines, Tension lines, flexure lines Transplant
Collateral circulation, Functional end arteries, Arteriosclerosis,

Level 3: Effect of hormones on bony growth, Wolff's law, Surface topology of articular surfaces, Spin, Swing, Cartilage Grafts, Kinesiology, Body liver system,Skin grafts,Ischaemia, Infarct,Bursitis

B) Regional Anatomy

I) UPPER LIMB

REGIONS : Mammary gland, Axilla, Cubital fossa, Fascial spaces of the hand

Relations and functional importance of individual structures, Dupuytren's contracture, Hand as a functional unit – grips, Nerve injury, carpal tunnel syndrome, Clavipectoral fascia; Salient features about carpals;

ARTHROLOGY

Shoulder girdle; Shoulder joint; Elbow; Radioulnar joints; Wrist; Carpometacarpal joint of thumb; Bones taking part

Classification of joints, Movement with muscles causing movements,
midcarpal joint, metacarpophalangeal joints,
interphalangeal joints

Fall on the outstretched hand

Level 2 Axilla: Collaterals Lymph nodes (breast) Axillary sheath cervico-axillary canal, Abscess drainage, Palm: comparative anatomy (thumb, palmaris brevis), position of rest and of function, collaterals, Fascial spaces: Surgical significance

OSTEOLOGY

Identification; Anatomical position; Parts; Joints formed; Development; identification of individual carpals in and articulated hand)

Clavicle: Line of force transmission, commonest site of fracture

Humerus: fractures -

Colles' fracture, Smith's fracture

Carpals, Metacarpals, Phalanges: Carpal tunnel syndrome, fracture scaphoid

Surgical approaches, Subluxation of head of radius, carrying angle

MYOLOGY:

Muscles of upper limb, attachment, Nerve supply, Actions

Applied aspects: Volkmann's ischaemic contracture

Quadrangular and triangular spaces, Triangle of auscultation

ANGIOLOGY: Axillary, Brachial, Radial, Ulnar Arteries, veins, lymphatics

Commencement, Termination, Main area of distribution and drainage, Anastomosis –

Applied aspects, Artery : Damage to vessels, Raynaud's disease, Veins: Thrombosis, Lymphatics: Lymphangitis (red streaks), lymphadenitis,

NEUROLOGY:

A. Nerves

Axillary, median, ulnar, musculocutaneous, radial, Origin, course, distribution, Root value

B. Plexus: Brachial

Applied aspects: Nerve injury at various sites - Tendon reflex - Winging of scapula, Erb's palsy, Klumpke's palsy, Crutch palsy, ulnar paradox

II) LOWER LIMB

REGION: boundaries, major contents**;** Gluteal, femoral triangle; Adductor canal, compartments of thigh, leg**;** Popliteal fossa, Adductor canal , Sole, Arches of foot,; Gluteal IM injections

Femoral hernia

blood supply to head of femur**;** Fracture neck of femur, mechanics movement of joints; hip and knee, Trendelenburg test; Knee joint : derangement, injuries to cruciate ligaments, menisci; (tear - bucket handle type); Ankle : Sprain

mechanism of venous return, varicose veinsz

Applied aspects of Adductor canal, popliteal aneurysms

OSTEOLOGY: Identification, region, anatomical position; parts, joints formed,

For tarsals - identification of individual tarsals in an articulated foot.

Level 2

Applied aspects: Bony specialization for bipeds, walking and transmission of weight,

Fracture, femoral torsion, neck shaft angle, bone grafts

ARTHROLOGY

Hip, knee, ankle, subtalar, Tibiofibular

Hip joint : dislocation, congenital, traumatic, surgical approaches to joints (anatomical basis), traumatic effusion, bursitis

MYOLOGY

Attachments, nerve supply, actions of: Muscles of lower limb

calf pump, antigravity muscles

ANGIOLOGY

Artery: Femoral, profunda femoris, popliteal, dorsalis pedis, Commencement, termination, main area of supply, course, relations & applied

Vein: Venous drainage of lower limb, long and short saphenous veins, Communication and valves. Varicose

Lymphatics: Inguinal group of lymph nodes

Lever 2 :intermittent claudication, clinical significance of anastomosis: around knee, venous thrombosis

NEUROLOGY

a. Plexus: Lumbar and sacral, Location, Formation, Distribution

b. Nerves: Root value of sciatic, femoral, obturator, tibial, common peroneal nerves; Origin, course, distribution; sciatica, foot drop

Level 2 : Pes cavus, equinovarus, clawing of toes

III) ABDOMEN

i) ANTERIOR ABDOMINAL WALL

Rectus sheath, quadrants and regions, Testes, epididymis, spermatic cord, scrotum

Level 2: Surgical incisions of abdomen types of inguinal herniae

Peritoneum, Lesser Omentum, Omental Bursa, Epiploic Foramen, Testes

Morphology, blood supply, lymphatic drainage

25. SPERMATIC CORD

Definition, beginning, end, course and contents, coverings, vasectomy

ii) Abdominal organs : Morphology relations blood supply, lymphatics nerve supply & applied Anatomy of following organs

STOMACH,SPLEEN, LIVER:,BILIARY APPARATUS, PANCREAS, SMALL INTESTINE,LARGE INTESTINE AND VERMIFORM APPENDIX,KIDNEYS, URETERS,SUPRARENAL GLANDS

Level 2: peptic ulcer ,Splenic circulation, splenic vascular segments,liver, biopsy, Support of liver,Gall stones **,**Duct system of pancreas **,**Surgical approach to kidney , stones (Renal), Ureter,Sites of constrictions, Hydronephrosis, pheochromocytoma

Level 3: Gastroscopy, Achlorhydria,Splenectomy ,Liver transplant,Pancreatitis, diabetes,Renal transplant,Stones in ureter, Cushing's disease

iii) Pelvic Viscera :- Morphology, relations, blood supply nerve supply & applied anatomy

URINARY BLADDER & URETHRA, UTERUS, OVARIES AND UTERINE TUBES, PROSTATE, RECTUM AND ANAL CANAL, UROGENITAL DIAPHRAGM (UGD)

Level 2: Supports and micturition, stones in bladder ,Ovarian cyst, enlargement complications, Fistula, Fissure, piles

Level 3: cystoscopy, Hysterectomy,cancer, Supports of rectum

iv) Perineum – Ischiorectal fossa, pudendal canal, perianal spaces Urogenital
diaphragm, male urethra, penis – perineal pouches
Level 2: Ischiorectal hernia

v) MYOLOGY
Anterior abdominal wall, Rectus sheath, Psoas major, Quadratus lumborum, Thoracoabdominal diaphragm, pelvic diaphragm, Thoracolumbar fascia, perineal spaces & muscles
Level 3: Psoas abscess

vi) OSTEOLOGY
Level 2: Pelvis - types
(various diameters), lumbar vertebrae, anatomical basis of disc prolapse, nerve compression
Level 3: Sacralization, Lumbarization
ARTHROLOGY
Movements of lumbar vertebrae, lumbosacral, sacroiliac, sacrococcygeal joints

vii) ANGIOLOGY :- Origin, course, termination, relations, branches & applied
anatomy of
PORTAL VEIN
Level 2: portasystemic communications
Level 3: Portasystemic communications in detail**;** Development
INFERIOR VENA CAVA,ABDOMINAL AORTA,INTERNAL ILIAC ARTERY

viii)NEUROLOGY,LUMBAR PLEXUS,SACRAL PLEXUS

IV) THORAX
i) THORACIC WALL,THORACIC INLET
Boundaries and contents
THORACIC OUTLET, Boundaries and contents, major openings and levels, Typical intercostal space, Boundaries and contents, muscles Atypical intercostal space, Movements of respiration

Level 2: importance and minor openings in outlet, Accessory muscles of respiration

Level 3: Applied aspects: Barrel chest, pectus excavatum, rickety rosary

ii) MEDIASTINUM

Divisions and major contents

Level 2: Mediastinitis, mediastinoscopy

SUPERIOR AND POSTERIOR MEDIASTINA, LIST OF STRUCTURES

Boundaries and contents:

Level 2 : Superior mediastinal Syndrome, Course, relation and branches / area of drainage

Level 3: Coarctation of aorta, aneurysm, developmental anomalies

iii)PLEURA

Pleural reflections, recesses, innervation

Level 2: importance of recesses

Level 3: pleural effusion

LUNGS

Gross description including lobes, fissures and bronchopulmonary segments

Level 2: relations, blood supply, nerve supply

Level 3: Postural drainage, surgical importance, of bronchopulmonary segments, foreign body inhalation

iv)PERICARDIUM & HEART

Divisions of pericardium and sinuses

Level 2: referred pain

Level 3: Pericardial effusion

HEART

Anatomical position, location, surfaces and borders, interior of all chambers, conducting system of heart; vessels of heart

Level 2: Relations, nerve supply - foramen ovale, patent IV septum, over-riding aorta, referred pain, functional end arteries - coronaries

Level 3: PDA, Fallot's tetralogy, etc.

v)OSTEOLOGY

IDENTIFICATION and parts of VERTEBRAE , RIBS – and STERNUM

Level 2: Identification of T1, T9, T10, T11, T12, vertebrae and atypical ribs - 1, 2, 11, 12. relations, attachments, ossification

Level 3: Fracture ribs, flail chest, compression fracture of vertebra

V) HEAD-FACE NECK

i) REGIONS AND ORGANS, FASCIAE OF THE NECK **TRIANGLES OF NECK**

Level 2 Spaces and spread of infections, axillary sheath **,** Relations of contents, Damage to accessory nerve, sialogram, approach to gland, bidigital palpation of submandibular glan**d,**Dangerous area of face, squint

Level 3: surgical neck incisions, external jugular vein - air embolism, LN biopsy, JVP, pulse, Frey's syndrome

GLANDS

Thyroid, Parathyroid, Parotid, Submandibular, sublingual, Pituitary
Morphology, capsule, relations, nerve supply, blood supply

FACE

Muscles, nerve supply - blood supply

SCALP,PALATE,TONGUE,LARYNX, PHARYNX, ORBIT, EYEBALL,STYLOID APPARATUS,NASAL CAVITY, EAR,INTERNAL EAR,MIDDLE EAR,EXTERNAL EAR,MENINGES

ii) OSTEOLOGY

Identification, anatomical position, parts, foramina in the skull, structures passing through them, norma basalis, verticalis, frontalis, lateralis, occipitalis and interior of cranial cavity
Foetal skull; Mandible: Age changes
Level 2: Fontanelles, Dental formula
Level 3: Fractures of the skull, Age of dentition, cervical rib, disc herniation

iii) ARTHROLOGY

TM JOINT
Level 2: Dislocation

iv) MYOLOGY

Sternomastoid, Digastric, Mylohyoid, Hyoglossus, Muscles of facial expression, mastication, larynx, pharynx, tongue, palate and, Extra-ocular muscles
Level 2 Relations, development
Level 3 facial nerve palsy

v) ANGIOLOGY

ARTERIES

Origin, parts, course, relations, branches of:
Subclavian, Internal carotid, External carotid, Vertebral, Lingual, Facial, Maxillary
Level 2: Sub-branches, distributions
Level 3: Subclavian steal syndrome, Subclavian-axillary anastomosis

VEINS

External and internal Jugular veins, venous drainage of face

VENOUS SINUSES

Names, locations, drainage, classification
EMISSARY VEINS, CAVERNOUS SINUS, LYMPHATIC DRAINAGE OF HEAD FACE NECK

vi) NEUROLOGY

Cranial nerves,Nucleus, course, relations, branches, distribution, reflex pathways & applied anatomy, PLEXUS: Cervical, Brachial, PARASYMPATHETIC GANGLIA, CERVICAL SYMPATHETIC CHAIN

VI) NEUROANATOMY

i) SPINAL CORD

Gross features: Extent (child / adult), enlargements, conus medullaris, filum terminale, spinal meninges Tracts Ascending and Descending

Level 2: Spinal segments, vertebral correlation, significance of enlargements
nuclei of grey matter at upper & lower cervical, mid-thoracic, Lumbar & sacral levels
Clinical correlation of lesions

Level 3: anomalies,lamination, syringomyelia, PID, tumours, TB, trauma, dislocation, myelography

ii) MEDULLA OBLONGATA

Gross features: Motor decussation: Sensory decussation: Inferior olivary nucleus Cranial nerve nuclei

Level 2: Tuber cinereum, pontobulbar body, Order of neurons, Details of nuclei and organisation of white matter
Level 3: medullary syndromes-Bulbar palsy, increased ICT, Arnold-Chiari malformation,

iii) PONS

Cross sections at the level of:

- Facial colliculus, Trigeminal nucleus

General features: Peduncles, Floor of the fourth ventricle

Level 2: Relations

Level 3: Tumours, pontine haemorrhage

iv) CEREBELLUM

Gross features: Division, Lobes, relations, internal structure -

Level 2: connections of,cerebellar cortex and intracerebellar nuclei, white matter classification, Purkinje neuron,

Level 3: dysfunction,-dysequilibrium, ataxia, hypotonia

Nuclei: Names of nuclei and important connections

Peduncles : Important tracts in the peduncles

Functions : Of archicerebellum, paleocerebellum & neocerebellum

v) MIDBRAIN

General features :

relations, contents of interpeduncular cistern, connections of red nucleus

Level 2: Weber's syndrome, Benedikt's syndrome

Level 1 :T.S. at inferior colliculus, TS at superior colliculus

vi) CEREBRUM

CORTEX, WHITE MATTER, BASAL NUCLEI, LIMBIC LOBE

Surfaces, borders, major sulci, gyri, poles, lobes, major functional areas, interior - gray and white matter

Gray - cortex - granular / agranular, striate, Basal nuclei - names, White matter - classification with examples; Components of limbic lobe

Level 2: handedness, Connections of limbic lobe

vii) DIENCEPHALON

Dorsal thalamus Epithalamus Metathalamus Hypothalamus Subthalamus

Boundaries, parts, relations (gross), cavity, major nuclei, gross connections

viii) VENTRICULAR SYSTEM

Parts, boundaries, foramina, correlation with parts of brain

Level 2: Choroid fissure, recesses, Queckenstedt's test

Level 3: Hydrocephalus, VA shunt

ix) BLOOD SUPPLY OF BRAIN

Circle of Willis, subarachnoid space, arteries, veins

Level 2: blood brain barrier, Hemiplegia

Level3: End arteries, CSF formation

x) MENINGES

Cerebral and spinal meninges, folds of dura, contents of subarachnoid spaces, arachnoid villi and granulations, direction of flow of CSF, lumbar puncture **Cisterns,** Definition, terminology, cisterna magna

Level 2: cisternal puncture, Queckensted's test, vertebral venous plexus, choroid plexus
Extracerebral and intracerebral communication, CSF block,
Level 3: Epidural space

C) MICROANATOMY

I) GENERAL HISTOLOGY

i) MICROSCOPE,

Light microscope: parts, magnification, resolution,Electron microscope,
Level 2 Micro techniques, H and E staining
Level 3: Polarizing microscope, phase contrast, scanning EM

ii) CYTOLOGY

Cell,Cytoplasm and nucleus,Cytomembranes,Unit membrane, **Cell organelles**
Mitochondrial DNA, mitochondrial myopathy

Level 2 Specialisations of cell surface, Sarcoplasmic reticulum of muscle, Primary and secondary lysosomes, residual bodies, Effect of colchicine and anticytotic drugs on spindles preventing mitosis, Endocytosis, exocytosis, movement of microvilli; Cell mitotic activity
Level 3 Lysosomal storage disease
NUCLEUS - Structure, nuclear envelope, chromatin, Barr body, nucleolus

iii) Epithelial

Definition, Classification, Structure of various types & subtypes of epithelia
Level 2: Nutrition, Renewal, Innervation,
Level 3: Metaplasia;
Surface modifications,Cilia; Microvilli; Stereocilia; Cell junction and junctional complexes;
Glands, Classification; Unicellular and Multicellular; Exocrine, Endocrine, Amphicrine. Exocrine: Simple, Compound; Apocrine, Merocrine, Holocrine; Tubular, alveolar, tubuloalveolar; Serous; Mucous; Mixed

iv) Connective tissue, classification, structure, fibres, ground substance,
loose areolar tissue, adipose tissue
Level 2 : Glycosaminoglycans
Level 3 : Scurvy, oedema, inflammation

v) Bone & Cartilage
Bone, Compact, Cancellous, Developing bone; ossification, Woven, lamellar bone
Cartilage, Classification, types, Perichondrium, functions
Level 2: Growth: Interstitial, Appositional; Bone callus, Osteomalacia , Osteoporosis , Osteoma
Level 3: Chondroma

vi) Muscle
Skeletal muscle Plain muscle Cardiac muscle Intercalated disc, syncitium; Sarcomere, I and A bands, myofibrils, myofilaments,; Sarcoplasmic reticulum,
Level 2: Innervation, Red fibres, white fibres
Level 3: Hypertrophy, Hyperplasia ,Rigor mortis , Myasthenia gravis

vii) Nervous
Neurons, types; Neuroglia, types; Myelinated nerve fibre *LS*; Non-myelinated nerve fibre; Peripheral nerve ; Nodes of Ranvier; Synapses;

viii) Vessels
Large sized artery Medium sized artery, Arteriole;Capillary,
Sinusoid;Medium sized vein;
Level 2: Atherosclerosis, Aneurysm, Infarcts, clotting
Lymphoid tissue
T cells, B cells;Mucosa Associated Lymphoid Tissue;Humoral immunity, Cell mediated immunity;Lymph node *section*; Thymus, Spleen, Tonsil
Level 2: Blood-thymus barrier, Open and closed circulation in the spleen
Level 3: Organ transplantation, Graft rejection, Autoimmune disease

II) SYSTEMIC HISTOLOGY

Basic organization, salient features, Identification
Structure and function correlation, individual features

i) Integumentary system
Skin – Types; Epidermis and dermis; various cells, Appendages of skin
Level 2: Renewal of epidermis
Level 3: Albinism, melanoma, Acne

ii) Alimentary system

a) Oral tissues

Lip, Tongue, taste buds, Papillae; Tooth, Developing tooth, Salivary glands

Level 2: Striated duct, ion transport

b) GI Tract

Basic organization - 4 layers;Oesophagus with glands Stomach - Fundus, Chief cells, Parietal cells, intrinsic factor; Stomach – Pylorus Duodenum Brunner's glands; Small intestine - with Peyer's patch, Appendix, Large intestine

Level 3: Pernicious anaemia, ulcer, gastritis, Hirschsprung's disease or megacolon

c) Glands

Pancreas: Exocrine, islets of Langerhans; Liver, Hepatic lobule, portal lobule,;portal acinus; Gall bladder

Level 2: Liver as an endocrine gland

Level 3: Diabetes mellitus, Cirrhosis of liver, liver regeneration, Chalones

iii) Respiratory system

Olfactory mucosa; Epiglottis; Trachea, Lung, Bronchus, bronchiole, alveolar duct, sac, alveoli, pulmonary type I and II cells

Level 2: Double spirally arranged bronchial smooth muscle

Level 3: Bronchial asthma, Hyaline membrane disease, Heart failure cells

iv) Urinary system

Basic organization; Nephron - Parts, podocytes, Collecting system; Kidney - Cortex, Medulla Ureter; Urinary bladder, Urethra

Level 2: Juxtaglomerular apparatus

v) Male reproductive system

Basic organization; Gonads, Tract, Accessory glands; Testis; Epididymis ; Vas deferens; Prostate ; Penis; Seminal vesicle

Level 2: Stages of spermatogenesis

Level 3: Immotile sperm

Female reproductive system

Basic organization; Gonads, Tracts, Accessory glands; ; Ovary - with corpus luteum; Fallopian tube; Uterus ; Cervix; Vagina, Mammary gland Active , Passive

Level 2: Stages of maturation of ovarian follicle , Phases of menstruation Colostrum, IgA, Placenta*:* Maternal unit, Foetal unit, Umbilical cord*:* Wharton's jelly

vi) Endocrine system:

Pituitary; Adenohypophysis; Neurohypophysis; Thyroid ; Follicular, parafollicular cells; Parathyroid ; Chief cells, oxyphil cells; Adrenal; Pancreas; Testis ; Ovary

Level 2: Hypothalamo-pituitary Portal system

Level 3: Pheochromocytoma

vii) Nervous system

A. Central

Basic organization; Cerebrum; Cerebellum; Spinal cord; Cervical; Thoracic; Lumbar; Sacral;

B. Peripheral

Sensory ganglia; Autonomic ganglia (sympathetic ganglion); Peripheral nerve

Special senses

I. Visual: Eyeball

Cornea ; Sclerocorneal junction ; Canal of Schlemm; Lens ; Retina ; Optic nerve

Level 3: Kerattoplasty, eye donation, glaucoma, retinal detachment

2. Auditory:

Internal ear; Cochlea ; Semicircular canals; Vestibule;

3. Olfactory

Nasal cavity

4. Gustatory

Tongue with taste buds

D) DEVELOPMENTAL ANATOMY

I) GENERAL EMBRYOLOGY

i) Introduction: Stages of human life phylogeny Ontogeny, Trimester, Viability,

Terms of reference: e.g. Cranial, Rostral, Caudal, Dorsal, Ventral, Lateral, Medial, Median, Planes of section

Level 3: The law of recapitulation, "Critical period", malformations, USG, Amniocentesis Chorionic Villus Biopsy, Fetoscopy, etc Teratology History of Embryology

ii) Gametogenesis: Menstrual cycle other reproductive cycles, Germ cell Transport and Fertilisation, Sperm capacitation, Methods of contraception, Sex determination

Level 3: Teratogenic influences; Fertility and Sterility, Surrogate motherhood; Social significance of "Sex-ratio",

iii) Cleavage, Blastocyst, Cytotrophoblast, Syncytiotrophoblast
Implantation: Normal sites, Abnormal sites,; Placenta praevia, Extra-embryonic Mesoderm and Coelom; Bilaminar disc - Prochordal plate
Level 2: "abortion"; Decidual reaction, Chorionic Gonadotropins - Pregnancy test,

iv) Primitive streak Notochord, Neural tube and its fate Neural crest cells - their fate, Development of somites, Intra-embryonic coelom, Foetal membranes :Chorionic villi, Amnion, Yolk sac, Allantois
Level 2: Congenital malformations, Nucleus pulposus, Sacrococcygeal teratomas, Neural tube defects, Anencephaly
Level 3: Signs of pregnancy in the first trimester, Role of teratogens, Alpha-fetoprotein levels

v) Folding of the embryo: Derivatives of germ layers,
Pharyngeal arches
Level 2: Thalidomide tragedy, Estimation of Embryonic Age - Superfoetation & superfoecundation

vi) Fetal membranes: Formation Functions, fate of: Chorion ; Amnion; Yolk sac; Allantois; Decidua; Umbilical cord; Placenta - Physiological functions; Foetomaternal circulation, Placental barrier, Twinning: monozygotic, dizygotic
Level 2: Placental hormones, Uterine growth, Parturition, Estimation of fetal age,

Level 3: Types of cord attachments, Chorion villus biopsy and Amniocentesis;
Uses of amniotic membranes, Trophoblastic tumours - Rh incompatibility, Haemolytic disease of newborn,

II) Systemic Embryology

i) Cardiovascular System - Venous System; Heart - Chambers - Septa - Truncus -
Aortic arches - Fetal circulation - Changes at birth, ASDs, VSDs, PDA, Fallot's Tetralogy.
Level 2: Veins, abnormalities, Surgical corrections

ii) The Respiratory System: Development of Larynx, Trachea, Bronchi, Lungs; Tracheo-oesophageal Fistula
Level 2: malformations
Level 3: Respiratory Distress Syndrome; Premature births

iii) The Alimentary System: Foregut: Oesophagus, Stomach, (Lesser sac); Duodenum - Hepatobiliary apparatus, Pancreas, Spleen, Portal vein; Midgut : Rotation and Fixation, Caecum and Appendix, Meckel's diverticulum; Hindgut : Cloaca; Rectum and Anal Canal

Level 2: Malformation - Tracheo-oesophageal fistulae; Congenital Hypertrophic Pyloric Stenosis; Atresia; Omphalocele, Hernia; Malformations - Fistulae, Situs inversus; Nonrotation; Mixed rotation of gut

iv) **The Urogenital System**, Development of Kidneys and Ureters; Cloaca - Urinary Bladder and Urethra; Suprarenal gland; Genital System - Testis and Ovary; Ducts and associated glands; External genital organs, Mesonephric and paramesonephric ducts, Uterine tube, Uterus and vagina

Level 2: congenital malformations; Ambiguous genitalia and Hermaphroditism ; Remnants and Vestiges of Ducts and Tubules

v) **Integument:** Development of mammary gland, skin & appendages

vi) Pharyngeal arches, nerves, muscles, cartilage, development of face, palate

vii) **Endocrine :** Glands, Adrenal, Thyroid, Parathyroid, Pituitary

viii) **The Nervous System**: Neural Tube: Spinal Cord and Brain i.e., Forebrain, Midbrain and Hindbrain, Hypophysis cerebri; Neural Crest : Peripheral Nervous System,

Level 2: correlation Spina bifida; Anencephaly, Hydrocephalus, Retinal detachment; glaucoma; Coloboma iris,

Level 3: Myelination of tracts shortening of spinal cord, Neural Tube Defects

Organs of the special senses - Eye and Ear

Ear - Internal ear -; External and middle ear - anomalies of the Ear

E) GENETICS

i) Introduction – Mendelism, Laws Genetic code

Level 2: Evolution, Eugenics and Polygenic inheritance, Radiation and mutation , Sex chromatin, Population genetics

ii) **Cytogenetics**

Structure and function of chromosomes, Cell cycle, Cell divisions, Spermatogenesis, Oogenesis

iii) **Molecular genetics** (Normal)

Gene, Genetic code, Structure and types of DNA, Structure of RNA

iv) Inheritance: Single gene inheritance, Multifactorial inheritance, Polygenic inheritance, Mitochondrial inheritance, Pedigree charts with symbols

Genetic basis of variation

Mutation, Polymorphism, Multiple allelism
Level 2: Types, Factors influencing mutational load

Developmental genetics
chromosomes; Lyon's hypothesis; Hermaphroditism and pseudohermaphroditism; teratogenesis

Gonadal dysgenesis, Adrenogenital syndrome Androgen insensitivity

Level 3: Counselling

Pedigree charting
Chromosomal basis of disease: Numerical, Structural abnormalities Down's, *Cri-du-chat*, Turner's, Klinefelter's
Level 2: Dermatographics
Level 3: Counselling

Prenatal diagnosis
Maternal Serum Sampling; Fetal USG; Fetal Amniocentesis; Fetal Chorion Villus Sampling
Level 2: (cordocentesis); Foetoscopy
Level 3: Eugenics

F) Radiological Anatomy

I) Introduction

Principles of plain radiograms and CT scan.

Identification of gross anatomical features in plain and contrast radiographs.

Identification of gross anatomical features in normal CT scan especially of the Abdomen and Head-Face-Neck-Brain regions.

Diagnostic procedures. Technical details (e.g. dye) are not necessary.

Level 2 : Estimation of age if epiphyseal line seen.

II) UPPER LIMB – X-Ray of

Shoulder region
Arm
Elbow region
Fore arm
Wrist and hand

III) LOWER LIMB

Hip region
Thigh
Knee region
Leg
Ankle region
Foot

IV) ABDOMEN

Plain X-ray
Ba meal
Ba meal follow through
Ba enema
Oral cholecystogram
Intravenous urogram
Cystogram
Ascending pyelogram
Abdominal Aortogram
Hystero-salpingogram
Myelogram
CT abdomen

V) THORAX

Plain X-ray
Ba swallow
Bronchogram
CT mediastinum
High resolution CT lung

VI) **HEAD-NECK**

X-ray skull plain
Carotid angiogram
Vertebral arteriogram
CT Scan Brain

NECK

Plain X-ray cervical region

G) SURFACE ANATOMY

I) SURFACE MARKING:

II) LIVING ANATOMY:

i) Upper Limb

(BONY) LANDMARKS(PALPATION OF):
Clavicle, Spine of scapula, Inferior angle, Coracoid process, Epicondyles of humerus, Olecranon process of ulna; Head and styloid processes of radius and ulna, Heads of metacarpals (knuckles), Pisiform, Hook of Hammate

JOINTS (DEMONSTRATION OF MOVEMENTS):
Shoulder girdle, Shoulder joint, Elbow joint, Radio-ulnar joints, Wrist joint, 1st carpo-metacarpal joint, MP and IP joints

MUSCLES (DEMONSTRATION OF ACTION)
Principle of testing: Trapezius, Serratus anterior, Latissimus dorsi, Pectoralis major, Deltoid, Biceps Brachii, Brachioradialis, Brachialis, Extensors at the elbow, Supinators, Wrist extensors, Wrist flexors, Small muscles of the hand

NERVES: Dermatomes, Ulnar
Ulnar nerve thickening in Leprosy

VESSELS (PALPATION OF): Axillary artery, Brachial artery, Radial artery
OTHERS: Axillary groups of lymph nodes; Anatomical snuff-box (boundaries)

ii) Lower Limb

(BONY) LANDMARKS (PALPATION OF): Anterior superior iliac spine, Iliac crest, Tubercle of the iliac crest, Ischial tuberosity, Greater trochanter, Adductor tubercle, Head and neck of fibula, Lateral and medial malleoli, Tibial tuberosity, Subcutaneous surface of tibia, Patella
JOINTS (DEMONSTRATION OF MOVEMENTS): Hip , Knee , Ankle , Subtalar Joints
MUSCLES (DEMONSTRATION OF ACTION): Hip-Flexors, Extensors, Abductors, Adductors
Knee: Flexors, Extensors,
Ankle: Dorsiflexors, Plantar flexors
Subtalar: Invertors, Evertors
NERVES: Dermatomes, Sciatic, Tibial, Common peroneal, Femoral, Obturator
Thickening of common peroneal nerve in Leprosy

VESSELS (PALPATION OF): Femoral, Popliteal, Dorsalis pedis, Posterior tibial
OTHERS: Ligamentum patellae, Inguinal lymph nodes
TENDONS: Semitendinosus, Semimembranosus, Biceps femoris, Iliotibial tract

iii) **ABDOMEN**
(BONY) LANDMARKS (PALPATION OF): Anterior superior iliac spine, Pubic tubercle
JOINTS (DEMONSTRATION OF MOVEMENTS): Intervertebral
MUSCLES (DEMONSTRATION OF ACTION): Obliques, Transversus abdominis, Rectus abdominis
NERVES: Dermatomes
OTHERS: Enlarged liver, spleen, kidneys, Abdominal quadrants and regions; Position of superficial and deep inguinal rings; Renal angle; McBurney's point;
Level2: Murphy's sign

iv) **THORAX (BONY) LANDMARKS(PALPATION OF):** Sternal angle, Counting of rib spaces, locating thoracic spines
JOINTS (DEMONSTRATION OF MOVEMENTS): Intervertebral
MUSCLES (DEMONSTRATION OF ACTION): Respiratory movements
NERVES: Dermatomes
OTHERS: Apex beat, Apices of the lungs, Triangle of auscultation

v) HEAD FACE NECK - **(BONY) LANDMARKS (PALPATION OF):**
Nasion, Glabella, Inion, Mastoid process, Suprameatal triangle, Zygoma, Zygomatic arch, Angle of mandible, Head of mandible,
JOINTS (DEMONSTRATION OF MOVEMENTS): Temporomandibular joint
MUSCLES (DEMONSTRATION OF ACTION): Of Mastication, Of Facial expression
Cranial nerves (I to XIII) testing
(PALPATION OF): Superficial temporal artery, Facial artery
(PALPATION OF**):** Symphysis menti, Hyoid bone, Thyroid cartilage, Cricoid cartilage, Tracheal rings, Suprasternal notch, Transverse process of atlas, Spine of C_7
(DEMONSTRATION OF MOVEMENTS): Atlanto-occipital joint, Cervical joints
(DEMONSTRATION OF ACTION): Sternocleidomastoid, Neck flexors and extensors
(PALPATION OF): Common carotid artery, External carotid artery
OTHERS: Thyroid gland, Cervical lymph nodes, (Horizontal and vertical), Midline structures in the neck

NOTE :- Level 2 and 3 mentioned in the above syllabus includes the topics " desirable to know" (level-2) and " Nice to know" (level-3. The remaining topics fall under the group " Must Know" (level-1.

H) University Exam. Pattern

I) Theory Examination Pattern (In Anatomy)

ANATOMY PAPER 1-includes gross anatomy, systemic histology and systemic embryology of the region **above diaphragm**.

ANATOMY PAPER 11-Includes the gross anatomy, systemic histology and systemic '1 embryology of the region below diaphragm. It also includes General histology, General 1 embryology, general anatomy & genetics.

NATURE OF EACH QUESTION PAPER

Faculty with Year **:** ***FIRST MBBS***

Subject **:** **ANATOMY**

Paper **:** ***I***

Total Marks **:** ***50*** ***Time*** **:** ***2 ½ Hours***

Section "A" (10 Marks)

Instructions:-

1) Fill (dark) the appropriate empty circle below the question number once only..
2) Use **blue/black** ball point pen only.
3) Each question carries **half mark.**
4) **Students will not be allotted mark if he/she overwrites strikes or put white ink on the circle once marked.**
5) Do not write anything on the blank portion of the question paper. If written anything, such type of act will be considered as an attempt to resort to unfair means.

Section "A" : MCQ (10 marks)

Question No.	Question Description	Division of Marks	Total Marks
1.	Total MCQs : 20	20 X ½	10

Section "B" & "C" (40 Marks)

Instructions:-

1) All questions are compulsory.
2) The number to the right indicates full marks.
3) Draw diagrams wherever necessary.
4) **Answer each section in the respective answerbook only. Answers written in the inappropriate sectional answer books will not be assessed in any case.**
5) Do not write anything on the blank portion of the question paper. If written anything, such type of act will be considered as an attempt to resort to unfair means.

6)

Section "B" : SAQ (24 Marks)

Question No	Question Description	Division of Marks	Total Marks
2.	**Brief answer questions (any six out of seven)** ***(two should be based on Applied Aspects)*** a) b) c) d) e) f) g)	6 X 4	24

Section "C" : LAQ (16 Marks)

Question No.	Question Description	Division of Marks	Total Marks
3.	**Solve any two out of three:** ***(Long answer question only)*** a) b) c)	2 X 8	16

Faculty with Year **:** ***FIRST MBBS***

Subject **:** **ANATOMY**

Paper **:** ***II***

Total Marks **:** ***50*** ***Time*** **:** ***2 ½ Hours***

Section "A" (10 Marks)

Instructions:-

1) Fill (dark) the appropriate empty circle below the question number once only..
2) Use **blue/black** ball point pen only.
3) Each question carries **half mark.**
4) **Students will not be allotted mark if he/she overwrites strikes or put white ink on the circle once marked.**
5) Do not write anything on the blank portion of the question paper. If written anything, such type of act will be considered as an attempt to resort to unfair means.

Section "A" : MCQ (10 marks)

Question No.	Question Description	Division of Marks	Total Marks
1.	Total MCQs :20	20 X ½	10

Section "B" & "C" (40 Marks)

Instructions:-

1) All questions are compulsory.
2) The number to the right indicates full marks.
3) Draw diagrams wherever necessary.
4) **Answer each section in the respective answerbook only. Answers written in the inappropriate sectional answer books will not be assessed in any case.**
5) Do not write anything on the blank portion of the question paper. If written anything, such type of act will be considered as an attempt to resort to unfair means.

Section "B" : SAQ (24 Marks)

Question No.	Question Description	Division of Marks	Total Marks
2.	**Brief answer questions (any six out of seven)** ***(two should be based on Applied Aspects)*** a) b) c) d) e) f) g)	6 X 4	24

Section "C" : LAQ (16 Marks)

Question No.	Question Description	Division of Marks	Total Marks
3.	**Solve any two out of three:** ***(Long answer question only)*** a) b) c)	2 X 8	16

II) Practical Exam. Pattern:

Marks for viva - 20

i) Axial Skeleton ...10 marks }Total 20 marks
ii) Appendicular skeleton ...5 marks }of viva
iii)Embryology models …5 marks

Practical marks ..40

iv) Soft parts dissected body, organs, viscera, brain ...20 marks }
v) Histology -spotting …..6marks 10 marks
-one slide for discussion …..4marks
vi) Radiology ...5 marks

vii) Surface living anatomy ….5 marks

I) Anatomy books recommended

1) Gray's Anatomy
2) Sahana's Human Anatomy
3) Chouraia's Human Anatomy 3 volumes
4) Cunningham's manual of Practical Anatomy
5) Regional Anatomy by R. J. Last
6) Human Histology by Inderbir Singh
7) Atlas of Human Histology- DIFORE
8) Surgical Anatomy- McGregor
9) Histolgoy- by ham,
10) Human Embryology – Inderbir Singh,
11) Medical Embryology – Langman,
12) Surface Anatomy & Radiology – Halim Das,
13) General Anatomy by – Chowrisia
14) Text book of Neuroanatomy – Inderbir Singh
15) Central Nervous System – Podar Bhagat
16) Clinical anatomy for medical students – Richard Snell
17) J.S.P. Lumbley at all – M.C.Q's in Anatomy

Academic Notification No. 40/2013 – Introduction of "Training In Cardio Pulmonary Resuscitation "Topic In 1st MBBS Physiology Practical Syllabus"

FIRST M.B.B.S. - SYLLABUS

HUMAN PHYSIOLOGY

I) GOAL

The broad goal of the teaching of undergraduate students in physiology aims at providing the student comprehensive knowledge of the normal functions of the organ systems of the body to facilitate an understanding of the physiological basis of health and diseases.

II) EDUCATIONAL OBJECTIVES:

1)At the end of the course, the student will be able to: describe the normal functions of all the organ systems, their regulatory mechanisms and interactions of the various systems for well-coordinated total body function.

2)Understand the relative contribution of each organ system in the maintenance of the milieu interior (homeostasis).

3)Explain the physiological aspects of normal growth and development.

Analyse the physiological responses and adaptation to environmental stresses.

4)Comprehend the physiological principles underlying pathogenesis and treatment of disease.

5)Correlate knowledge of physiology of human reproductive system in relation to National Family Welfare Program.

III) SKILL :

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

1) Conduct experiments designed for study of physiological phenomena.
2) Interpret experimental/investigative data.
3) Distinguish between normal & abnormal data derived as a result of tests which he/she has performed and observed in the laboratory.

IV) INTEGRATION :

At the end of the integrated teaching the student shall acquire an integrated knowledge of organ structure and function and its regulatory mechanisms.

V) COURSE CONTENT :

Theory

List of topics.

A) GENERAL PHYSIOLOGY. (5 hours)

Must know.

- Introduction to Physiology
- Branches of Physiology
- Functional organization of human body.
- External and internal environment
- Homeostasis, Biofeedback mechanisms

Cell Physiology:

- Transport across cell membrane.

B) HEMATOLOGY : (15 hours)

Must know

- Composition of blood
- Functions of blood
- Plasma proteins: Types, concentration, functions.
- Erythrocytes: Morphology, functions, normal count physiological variations in normal count & anaemia, polycythemia.
- Haemopoesis: general concepts
- Erythropoiesis: stages, Sites, regulation, reticulocyte & its clinical significance.
- Haemoglobin: Functions, normal values, physiological variations.
- Fate of erythrocytes: life span, Catabolism of Hb, bilirubin metabolism, jaundice.
- Physiological basis of anaemia, nutritional anaemia.
- Polycythemia: Primary & secondary.

- Leukocytes: differences between R.B.C. & W.B.C., types of W.B.C.s normal count & differential W.B.C. count, physiological variations, properties, functions of W.B.C.s,,

  Granulopoiesis – stages, regulation,

  Lymphopoiesis.

  Pathological variations in total & differential W.B.C. count.

- Immunity: definition, concept of antigen & antibody, types of immunity- Innate & Acquired, & their mechanism, cell mediated & humeral immunity, B lymphocytes, T lymphocytes & their types.

  Primary & secondary response, basis of vaccination.

- Blood groups: Landsteiner's law,

  ABO System – type A & B antigen, ABO system & inheritance, relation to transfusion, cross matching major & minor.

  Rh System – inheritance, Rh incompatibility & blood transfusion, Erythroblastosis foetalis.

- Blood transfusion: indications, storage of blood & changes during storage, transfusion reactions.
- Monocyte - macrophage system: Classification, functions, functions of spleen.
- Hemostasis: definition, basic mechanisms of Hemostasis,
- Platelets:structure, normal count & variations, functions, role in platelet plug formation, Hemostasis & clot retraction.
- Blood coagulation: Coagulation factors in plasma, basic mechanism of blood clotting, intrinsic & extrinsic pathways & difference between two pathways, role of calcium in coagulation, role of vitamin K, fate of clot.

  Anticoagulants – commonly used & their mechanism of actions, blood coagulation tests – bleeding time, clotting time.

  Haemophilia.

- Body fluid compartments: role of water in body & its distributions, different body fluid compartments & composition of their fluid.

- Blood volume: normal value, physiological & pathological variations, blood volume regulation in detail (To be taken at end of lectures on C.V.S, kidney and endocrines)

Desirable to know

- Physical properties of blood.
- Plasma proteins: Plasmapheresis, role of liver in plasma protein synthesis, relationship of diet & plasma protein synthesis.
- R.B.C.: advantages of biconcave shape.
- Bone marrow structure and cellular elements.
- Common Haemoglobinopathies (Hbs, Hbc, Thalassaemia)
- Method of determination of life span of R.B.Cs.
- Types of jaundice.
- Polycythemia – effects on haemodynamics,.
- Immunity: Antibody structure & types, antigen – antibody reactions.
- Blood group: M. N. system, other blood groups.
- Thrombocytosis, thrombocytopenia purpura.
- Anticoagulants: used in vitro & in vivo.
- Other blood coagulation tests.
- Classification of haemorrhagic diseases, D.I.C.
- Measurement of: total body water, blood volume, plasma volume, I.C.F. volume.

Nice to know

- Blood component therapy.
- Effects of splenectomy.
- Plasmin system.

C) NERVE (5 hours)

Must know:

- Distinctive histological features relevant to functions of nerve fibers.
- Classification of nerve fibers: based on structure, diameter, functions and only for sensory nerves.
- R.M.P. definition, production & maintenance, method of measurement, significance.
- Action potential: definition,

  Phases – depolarization, repolarisation, ionic basis of depolarization & repolarisation.

  Production & propagation of A.P.,

  Properties of A.P., significance.
- Properties of nerve fibers.
- Strength duration curve: chronaxie and factors affecting it.
- Factors affecting conduction in a nerve.

Desirable to know:

- Experimental techniques to study the mechanism of production of R.M.P. & A.P.: patch clamp, voltage clamp
- Methods of recording of A.P.

D) MUSCLE (7 hours)

Must know.

- Classification of muscles,
- Structure of skeletal muscle:

  Electronomicroscopic structure, muscle proteins – contractile, regulatory, structural & enzymatic.

  Sarcoplasmic tubular system: concept of sarcoplasmic triads & their functions.
- Neuromuscular transmission: Physiologic anatomy, events, N-M blocking & its clinical significance, applied aspect – myasthenia gravis.

- Excitation – contraction coupling.
- Molecular basis of skeletal muscle contraction: sliding filament theory, power stroke – corss bridge cycle, role of calcium.
- Energetics: fuel used by skeletal, muscle at rest & in exercise, metabolic pathways involved to yield A.T.P.,

  Oxygen debt: definition, types (lactic, alactic), incurring of debt, repaying the debt, significance.
- Properties of skeletal muscle: excitability, refractory period (absolute, relative), conductivity, contractility – types (isometric, isotonic), effects of summations (multiple motor unit summation, frequency summation & tetanizibility), all or none law, extensibility & elasticity, fatiguability.
- Factors affecting development of tension in the muscle:
  a) number of motor units contracting- type of muscle, number of muscle fibers in each unit activated, supraspinal influences.
  b) length – tension relationship
  c) frequency of stimuli, duration of stimulation
  d) load
  e) type of contraction
  f) Chemical composition of muscle fibers and ions.
- E.M.G. (in brief)
- Skeletal muscle circulation.
- Smooth muscle: structure, distribution, types molecular mechanism of contraction, properties, regulation, and disorders.

Desirable to know

- Heat liberated during various phases of contraction, Fenn effect.
- Recording of muscle activity.

Nice to know

- E.M.G. details.

E) RESPIRATORY PHYSIOLOGY (15 hours)

Must know:

- Physiologic anatomy
- Functions of respiratory system, non respiratory functions of lung
- Mechanics of respiration:

Ventilation :

Inspiratory & expiratory muscles, intraplural pressure, lung & thoracic compliance, factors affecting compliance, work of breathing, surface tension forces & role of surfactant, airway resistance, elastic resistance.

- Lung volumes and capacities. Measurement, physiological & significance (tidal volume, vital capacity, forced vital capacity – details)
- Pulmonary ventilation, alveolar ventilation, alveolar dead space, - applied aspect,

Maximum breathing capacity & breathing reserve.

Diffusion of Gases :

- Exchange of respiratory gases at alveolar – capillary membrane, factors affecting diffusion.

Gas Transport :

- Transport of oxygen, role of Haemoglobin, oxygen dissociation curve & factors affecting it.
- Transport of carbon dioxide

Control of Breathing :

Neural control – higher centers, reflexes.

Chemical control – central & peripheral chemoreceptors role of CO_2, O_2, H^+

Pulmonary Circulation

- Characteristics
- Ventilation perfusion ratio
- Respiratory adjustment in exercise.
- Hypoxia: types & high altitude hypoxia.

- Artificial respiration:
- Pulmonary function tests - principles

Desirable to know.

- Method of determination of dead space, residual volume, functional residual capacity.
- Oxygen therapy: indications, hazards of hyperbaric oxygen & use.

Nice to know

- Concept of P_{50}
- Positive pressure breathing.

F) CARDIOVASCULAR PHYSIOLOGY (20 hours)

Must know:

- Introduction, functions & importance of the system.
- General organization.
- Structure of heart, pericardium, myocardium, endocardium, nerve supply, Histology, details of cell junctions, syncytium, contractile & conducting fibers.
- Properties of cardiac muscle: excitability, conductivity, contractility, autorhythmicity, all or none law, long refractory period.
- Junctional tissues of heart, pacemaker potential, action potential of cardiac muscle.
- Generation & conduction of cardiac impulse.
- ECG: lead arrangement, normal waves & their significance with reference to lead II
- Cardiac cycle: pressure – volume changes, heart sounds & their clinical significance, correlation of pressure, volume, ECG, heart sounds in cardiac cycle.
- Heart rate & its regulation.
- Haemodynamics - def.,blood flow, resistance
- Cardiac output: normal values, physiological variations, factors affecting cardiac output – details, regulation, measurement – principles.

- Blood pressure:

  Normal levels, measurement, determinants, short term & long term regulation - details.
- Capillary circulation, tissue fluid formation.
- Lymphatic system: Anatomy & structure, formation of lymph, composition of lymph, functions of lymphatic system, lymphflow & factors affecting it.
- Regional circulation: Physiologic anatomy, factors affecting, special features: coronary, cerebral , skin, portal
- Adaptation of cardiopulmonary system to various grades of exercise.
- Hemorrhagic shock – stages & compensatory mechanisms, effects on body, physiological basis of treatment in brief.

Desirable to know:

- Ion channel & receptors (physiological, pharmacological & clinical significance)
- E.C.G. – electrical axis of heart, heart blocks, arrhythmias, ischaemia, infarctions.
- Heart sounds: murmurs & their clinical significance.

Nice to know

- Experimental methods of studying cardiovascular physiology,
- Patho physiology of oedema

G) RENAL PHYSIOLOGY (10 hours)

Must know:

- General introduction, structure & functions of kidney.
- Renal circulation: special features from functional point of view.
- Concept of clearance: to study renal physiology, for :

a) GFR – Inulin, Creatinine, basic principle of radioisotope method.

b) Renal blood flow – PAH

c) Concentration & dilution of urine – free water.

- Formation of urine:

1) Glomerular stage – GFR (definition, dynamics, factors affecting & measurement))

2) Tubular stage – Reabsorption & secretion.

   a) Sodium, potassium, glucose : details
   b) Handling of water – concentration & dilution of urine.
   c) Secretion of H^+

3) Role of kidney in acid – base balance.

- Physiology of micturition: basic reflex & control, cystometrogram.
- Artificial kidney: basic principles of dialysis.

Desirable to know:

- Experimental studies for renal functions.

Nice to know

- Disorders of micturition.

H) BODY TEMPERATURE REGULATION: (2 hours)

Must know:

- Homeothermia – Balance between heat gain & heat loss.
- Regulation of body temperature,

Desirable to know:

- Hyperthermia, Hypothermia.

I) ALIMENTARY SYSTEM: (12 hours)

Must know:

- General introduction & organizational plan, innervations and blood supply.

Salivary secretion:

- General principles & basic mechanisms of secretion composition ,and functions of saliva, mechanism & regulation of salivary secretion.

Mastication and deglutition:

- Three phases of deglutition- physiologic anatomy, mechanism & control

Gastric secretion:

- Functional anatomy, histology, functions of stomach, composition of gastric juice, cellular mechanism of gastric secretion of acid, pepsin, intrinsic factor, other enzymes, phases of gastric secretion, regulation of gastric secretion.
- Gastric Motility:

  Electrical activity of stomach, pylorus, emptying of the stomach-pyloric pump, regulation & factors promoting & inhibiting emptying.

Pancreatic secretion:

- Structure, composition & mechanism of secretion of electrolytes & enzymes, regulation of secretion.
- Liver & gall bladder:

  Microscopic structure, functions of liver, composition of bile, cellular mechanism of bile formation, enterohepatic circulation of bile salts, control of secretion, concentration & storage of bile in gall bladder. filling & evacuation of gall bladder functions of gall bladder

  Intestinal secretion:

- Structure, innervations.
- Composition & mechanism of secretion of small intestinal juice, regulation of secretion.
- Secretion of large intestine: mucous, water, electrolyte.
- Motility of small intestine:

  Structure & innervation electrical activity of smooth muscle, resting membrane potential, slow waves, spike potentials, rhythmic segmenting contractions, peristalsis, control – neural & hormonal, functions of ileocecal valve.
- Motility of large intestine:
- Structure & innervation,'mixing & mass movements, defecation reflex' and its control
- G.I. hormones: in brief.

Digestion & absorption:

Digestion & absorption of - carbohydrate,
- Proteins
- Fats

absorption of water, electrolytes and vitamins.

Desirable to know:

- Gastric mucosal barrier, experiments to study regulation of gastric juice secretion, disorders of secretion, peptic ulcer., inhibitors of gastric secretion
- Effects of vagotomy, abnormal gastric motility vomiting.
- Barium meal studies, endoscopy, biopsy.
- Pathophysiology of small intestinal motility, paralytic ileus, diarrhea, obstruction.
- Pathophysiology of colonic motility, irritable bowel syndrome, drugs, constipation.
- Pancreatic function tests.
- Gall stone, effects of removal of gall bladder

Nice to know

- Disturbances of esophageal motility, spasm, achalasia, hiatus hernia.
- Methods for study of intestinal absorption.
- Effects of hepatectomy.

J) NUTRITION: (2 hours)

Must know:

- concept of balanced diet
- factors affecting caloric requirements
- requirements of various nutrients, sources, daily needs.
- nutrition under special conditions – pregnancy, lactation, growing child.

K) ENDOCRINE SYSTEM (10 hours)

Must know:

- Introduction
- Endocrine functions of Hypothalamus – releasing hormones, Mechanism of hormone action
- Anterior pituitary hormones:
  functions, regulation, disorders.
  posterior pituitary hormones,ADH, Oxytocin. functions, regulation, disorders.

Thyroid:
hormone: synthesis, fate, functions, regulation, disorders.

- Parathyroid:

hormone: synthesis, functions, regulation, disorders – tetany.

- Adrenal cortex: and medulla.

hormone: secretion, functions, regulation, disorders

- Pancreatic hormones:

secretion, functions, regulation, disorders.

Desirable to know:

- Radioimmuno assays.

Nice to know

- Experimental studies.

L) REPRODUCTIVE PHYSIOLOGY: (8 hours)

Must know:

- Sex chromosomes, sex determination, sex differentiation
- Functional anatomy of reproductive system.
- Puberty: changes in males & females and its control.
- Spermatogenesis: stages & regulation

Semen analysis.

- Testosterone: actions & regulation.
- Male sexual act.
- Menstrual cycle & ovarian cycle:

Phases & hormonal regulation.

- Menopause.
- Ovulation: indicators & importance
- Fertilization, implantation of ovum.
- Functions of placenta
- Physiology of pregnancy;
- Maternal changes during pregnancy
- Parturition: in brief – stages and mechanism.
- Lactation: initiation & maintenance and control.

advantages of breast-feeding.

- Contraception: to be taken as integrated topic.

Desirable to know:

- Sex chromosomes: Barr bodies.
- Development of genitals & gonads

Nice to know

- Precocious & delayed puberty.

M) SPECIAL SENSES (8 hours)

Must know:

- Eye:

Functional anatomy of eye, optics, microscopic structure of retina with retinal circuits, image formation,

Photochemistry of vision (photopic & scotopic vision, dark & light adoption),

Pupillary reflexes, Accommodation reaction, Errors of refraction and their correction, Colour vision – physiological & neural basis, accepted theory

of colour vision, classifications, basis of colour blindness and tests of colour blindness, significance.

Visual pathway – processing of information at different levels in visual pathway, organisation of visual cortex. Effects of lesion at different levels in visual pathway,

Movements of eyeballs: functions & control.

- Ear:

Physics of sound, decibel system,

Functions of external ear,

Functional anatomy of middle ear, functions of middle ear in detail, assessment of functions of middle ear, Functional anatomy of cochlea, functions of inner ear, place principle, theories of hearing.

- Audiometry,

Auditory pathway & important features, auditory cortex (role in hearing & speech development)

- Taste:

Functional anatomy of taste buds, different taste modalities, pathway, factors affecting taste sensation,

- Smell:

Functional anatomy of receptors, primary olfactory sensations, pathway, factors affecting smell sensation,

Desirable to know:

- Resolution of images,
- Electrophysiology of internal ear: cochlear micro phonics.

Nice to know

- Electrophysiology of retina.
- Theories of hearing.

N) CENTRAL NERVOUS SYSTEM: (50 hours)

Must know

- Outline of nervous system.

1) General nervous system:

Synapse: definition, physiological anatomy, sequence of events of synaptic transmission, properties, (state the property & its significance), significance of synaptic transmission, applied aspect.

Neurotransmitters – in brief.

Receptors: definition, classification (basis of each classification with example), properties (state each property with underlying mechanism & significance), significance (homeostasis, conscious awareness of environment, tone posture, protection).

Sensations: different modalities, classification with examples and significance

- sensation of touch, pain proprioception : details of each

Reflexes: definition, classification (basis of classification with example), reflex arc & its components, properties (state each property with basis & importance)

Stretch reflex – definition, muscle spindle (details with innervation, role of gamma motor neurons) role of supra spinal control – in brief, functions of stretch reflex (regulation of muscle tone) inverse stretch reflex.

Polysynaptic reflexes: withdrawal reflex.

2) Tracts:

Ascending & descending tracts: details of each tracts – (situation & extent in spinal cord, origin, course & termination, collaterals, somatotopic arrangement, functions, applied aspect, tests)

Ascending tracts: Basic plan of somato sensory pathway for conscious Sensation, pathway from head, face region.

Descending tracts: pyramidal tracts – details., extra pyramidal tracts, differences between UMN & LMN lesions.

2) Sections at various levels in CNS :

a) Spinal transection – spinal animal.

Complete – 3 stages – spinal shock, stage of recovery, stage of reflex failure – details of each stage.

Incomplete. Transection

Hemisection

b) Low midbrain section – decerebrate animal : Decerebrate rigidity. (Classical & ischaemic with mechanisms, characteristics features, physiological significance)

c) High midbrain section – High decerebrate animal.

d) Thalamic or Decorticate animal.

3) Posture - & Equilibrium.

Definition, classification of postural reflexes.

(Details of each reflex and its function.)

regulation of posture (integrating centers at various levels of CNS)

vestibular apparatus : Physiologic anatomy, mode of function of utricle & saccule and semicircular canals, vestibulo occular & vestibulo spinal reflexes.

4) Thalamus :

Functional classification of Thalamic nuclei, with connections of different nuclear groups, functions of thalamus, thalamic syndrome.

5) Hypothalamus :

Functional classification of different hypothalamic nuclei, connections in brief, functions in details.

6) Limbic system :

Parts of limbic system, connections in brief, functions.

7) Reticular formation :

Introduction, anatomy in brief, functional divisions.

(A)Ascending reticular activating system – details with connections & role in sleep wakeful cycle, applied aspect.

(B) Descending reticular system – role in regulation of muscle tone by pontine & medullary regions.

(C) Visceral centres.

8) E. E. G. :

Definition, different waves, characteristics & functional significance of each wave, physiological variation, clinical application in brief.

9) Sleep & Wakefulness :

Concept of alertness & wakefulness with their physiological basis, Definition of sleep, stages of sleep correlated with EEG, sleep cycle – types of sleep, salient features of NREM & REM sleep, physiological effects of sleep on different systems of the body, Neurophysiological mechanisms of sleep, functions of sleep.

10) Cerebellum :

Introduction, functional classification, intracortical circuit, deep cerebellar nuclei, connections of different lobes, functions of cerebellum, cerebellar function tests, effects of lesion in brief.

11) Basal Ganglia :

Introduction, classification of nuclei, connections, intracortical circuits, functions, lesions - Pa rkinsonism.

12) Cerebral Cortex :

Gross anatomy & divisions, concept of Broadmann's mapping with diagram, Parietal lobe – anatomical & functional divisions, details of each functional part as regards connections, topographic organisation, functions. Frontal lobe – excitomoter Cortex – anatomical & functional parts, details of each part as regards connections, topographic organisation, functions.

Prefrontal Cortex – different areas, connections in brief, functions, effects of lobectomy.

13) speech –

Afferent and efferent mechanisms and role of cortical centers in speech, concept of cerebral dominance, development of speech, vocalization.

14) Memory :

Definition, stages, types, physiological basis, factors affecting, applied – amnesias in brief.

15) Learning :

Definition, types with examples, stages, factors influencing, role of motivation (positive & negative reinforcement, reward & punishment), physiological basis – role of different parts of CNS, structural, biochemical changes.

16) Conditioned reflexes :

Definition, difference between unconditioned & conditioned reflexes, development of conditioned reflexes, properties, significance.

17) Autonomic nervous system :

Organization and functions of Parasympathetic & Sympathetic and their control.

18) CSF :

Introduction, composition, normal CSF pressure, formation & circulation, functions, applied aspect – brief, blood brain barrier, blood CSF barrier.

19) " Physiology of Brain Death & changes after that " (This topic included vide Academic Council Resolution No. 303/2008 dated 29/07/2008)

Introduction of " Brain Death and Organ Donation" topic in subjects of Physiology , Preventive & Social Medicine, Psychiatry, Medicine & Surgery

Desirable to know :

General nervous system :

Neurotransmitters – details, susceptibility of synapse to hypoxia drugs etc., Mechanisms of referred pain, differences between superficial & deep pain, central analgesia system, supraspinal control of stretch reflex – details.

Thalamus - applied aspects – effects of lesions.

Hypothalamus - applied aspects – effects of lesions

Reticular formation – effects of lesion

EEG – Method of recording, abnormal patterns.

Basal Ganglia – lesions, involuntary movements.

Cerebellum – Embryology, evolution, effects of stimulation & ablation.

Cerebral cortex – effects of stimulation & ablation in different regions.

Speech – aphasias.

Nice to know

Experimental studies – effects of stimulation & ablation.

Sleep, wakefulness – effects of sleep deprivation, disorders.

Books recommended:

1) Textbooks of Physiology :

Guyton	-	Textbook of Physiology
Ganong	-	Review of Medical Physiology
S. Wright	-	Applied Physiology

2) Reference Books :

Best and Taylor	-	Physiological basis of medical practice
Berne & levy.	-	Principles of Physiology
Dr. V.G. Ranade	-	Laboratory Manual and Journal of Physiology Practicals

(A) Haematology

Hb% R. B. C. W. B. C. Differential, B.T.C.T. Blood group, ABO system Rh typing, Blood Indices

(B)Clinical examination and Human experiments

Stethography, Spirometry, Ergography, Perimetry, Tests for physical fitness, Clinical examination of all systems.

(C)Demonstrations

Reticulocyte count. Platelet count, P. C. V., E. S. R, fragility, peripheral blood smear, bone marrow slides,

E.M.G. S.D. curve, conduction velocity of nerve (Human), E.C.G., E.E.G., Audiometry, H.R.T. (Human reaction time)

Visit to blood bank, wards to show common disorders or video tapes (list given in appendix I), X-rays (list given in appendix II)

Animal experiments on frogs,

a) Skeletal muscle:

effect of graded stimuli,

simple muscle twitch

genesis of tetanus,

effect of load on skeletal muscle

fatigue.

"Velocity of Nerve Impulse & Effect of Two Successive Stimuli in Skeletal Muscle" (his two expt. Is added in new syllabus vide academic council resolution No. 64/2009 dated 28/04/2009)

Introduction of " Velocity of Nerve Impulse &Effect of Two Successive Stimuli in Skeletal Muscle Topic in 1st MBBS Practical Syllabus

b) Cardiac muscle.

normal cardiogram, effect of temperature,

properties of cardiac muscle,

effect of vagal stimulation and phenomenon of vagal escape.

effect of drugs (Acetyl choline, Adrenaline, Nicotine) on frog's heart.

perfusion of isolated frogs heart with effects of Na^+ , K^+ and Ca^{++},

- and demonstration of Starling's law

Museum to be developed

Historical land marks, Nobel laureates

VII) EVALUATION :

a) Theory – systems to be included are

Paper I

Cardiovascular, Respiratory, Gastrointestinal, Endocrines, Reproduction, Acclimatization to hypoxia, Temperature regulation, Exercise physiology

Paper II

Cell membrane and transport systems across the cell membrane, Homeostasis Nerve and Muscle Physiology, Blood, Excretory, C.N.S. and special senses.

Duration of each paper : 2 Hours & 30 minutes

(30 minutes – **Section** A – M.C.Q.

2 hours – **Section B** & C)

MCQ Section A will be given to the candidate at the beginning of the examination. After 30 minutes, Section A will be collected. Paper containing Section B and Section C will then be handed over to the candidate. Section B and Section C are to be written in separate answer sheets.

Marks : Total marks for each paper : 50

NATURE OF QUESTION PAPER

Faculty with Year **:** ***FIRST MBBS***

Subject **:** **PHYSIOLOGY**

Paper **:** ***I***

Total Marks **:** ***50*** ***Time*** **:** ***2 ½ Hours***

Section "A" (10 Marks)

Instructions:-

1) Fill (dark) the appropriate empty circle below the question number once only..
2) Use **blue/black** ball point pen only.
3) Each question carries **one / half mark.**
4) **Students will not be allotted mark if he/she overwrites strikes or put white ink on the cross once marked.**
5) Do not write anything on the blank portion of the question paper. If written anything, such type of act will be considered as an attempt to resort to unfair means.

Section "A" : MCQ (10 marks)

Question No.	Question Description	Division of Marks	Total Marks
1.	Total MCQs : 20	20 X ½	10

Section "B" & "C" (40 Marks)

Instructions:-

1) All questions are compulsory.
2) The number to the right indicates full marks.
3) Draw diagrams wherever necessary.
4) **Answer each section in the respective answerbook only. Answers written in the inappropriate sectional answer books will not be assessed in any case.**
5) Do not write anything on the blank portion of the question paper. If written anything, such type of act will be considered as an attempt to resort to unfair means.

Section "B" : SAQ (24 Marks)

Question No.	Question Description	Division of Marks	Total Marks
2.	**Brief answer questions (any six out of seven)** ***(two should be based on Applied Aspects)*** a) b) c) d) e) f) g)	6 X 4	24

Section "C" : LAQ (16 Marks)

Question No.	Question Description	Division of Marks	Total Marks
3.	**Solve any two out of three:** ***(Long answer question only)*** a) b) c)	2 X 8	16

Faculty with Year : FIRST MBBS

Subject : PHYSIOLOGY

Paper : II

Total Marks : 50 ***Time : 2 ½ Hours***

Section "A" (10 Marks)

Instructions:-

1) Fill (dark) the appropriate empty circle below the question number once only..
2) Use **blue/black** ball point pen only.
3) Each question carries **one / half mark.**
4) **Students will not be allotted mark if he/she overwrites strikes or put white ink on the cross once marked.**
5) Do not write anything on the blank portion of the question paper. If written anything, such type of act will be considered as an attempt to resort to unfair means.

Section "A" : MCQ (10 marks)

Question No.	Question Description	Division of Marks	Total Marks
1.	Total MCQs : 20	20 X ½	10

Section "B" & "C" (40 Marks)

Instructions:-

1) All questions are compulsory.
2) The number to the right indicates full marks.
3) Draw diagrams wherever necessary.
4) **Answer each section in the respective answerbook only. Answers written in the inappropriate sectional answer books will not be assessed in any case.**
5) Do not write anything on the blank portion of the question paper. If written anything, such type of act will be considered as an attempt to resort to unfair means.

Section "B" : SAQ (24 Marks)

Question No.	Question Description	Division of Marks	Total Marks
2.	**Brief answer questions (any six out of seven)** ***(two should be based on Applied Aspects)*** a) b) c) d) e) f) g)	6 X 4	24

Section "C" : LAQ (16 Marks)

Question No.	Question Description	Division of Marks	Total Marks
3.	**Solve any two out of three:** ***(Long answer question only)*** a) b) c)	2 X 8	16

C) PATTERN OF VIVA VOCE AND PRACTICAL EXAMINATION

There shall be separate batches of students for viva and Practicals.

(i) Viva examination (orals) Total marks 20 Duration – 20 minutes.

Four Examiners (5 minutes with each examiner)

(ii)Two Examiners for topics of paper I systems to be distributed,

Two Examiners for topics of paper II systems to be distributed,

(B) Practical examinationTotal marks 40

3 Exercises:

Exercise	(1) Clinical examination	… 20 marks,
	4 sub questions each of 5 marks,	
	(i) C.V.S.	…5
	(ii) R.S.	…5
	(iii) C.N.S. & Special senses	…5
	(iv) Abdomen	…5
Exercise	(2) Haematology	…10 marks,
Exercise	(3) Short exercise	…10 marks,

Sub questions each having 2 marks,

Calculations,

Interpretation of graphs,

Charts,

Data analysis and interpretation

Photographs on-endocrine disorders,

Neurological disorder,

APPENDIX I

List of common disorders to be shown during word visits or using video tapes.

1. Generalised Oedema

2. Anaemia
3. Jaundice
4. Hepatomegaly
5. Splenomegaly
6. Ascites
7. Myxoedema
8. Cretinism
9. Hyperthyroidism
10. Dwarfism
11. Acromegaly
12. Facial nerve paralysis
13. Hemiplegia
14. Paraplegia
15. Parkinsonism
16. Cerebellar dysfunction.

APPENDIX II

List of X-rays to be shown along with clinical examinations to improve understanding.

1. Normal X-ray chest
2. Consolidation of lung
3. Pleural effusion showing mediastinal shift
4. Collapse of lung / cavity in lung
5. Hyper inflated lungs in emphysema
6. Left ventricular hypertrophy showing shift of apex beat
7. Barium meal follow through – oesophagus, stomach, small and large intestine.

APPENDIX III

Topics to be asked as applied questions in theory .

A brief history and diagnosis to be provided.

1. Erythroblastosis foetalis
2. Haemophilia, purpura
3. Myasthenia gravis
4. Peptic ulcer
5. Oedema
6. Jaundice and anaemia – due to mismatched transfusion
7. Myxoedema
8. Cretinism
9. Hyperthyroidism
10. Tetany
11. Acromegaly, Gigantism
12. Respiratory distress syndrome
13. Parkinsonism
14. Asthma
15. Hemiplegia
16. Spinal cord injury
17. Deafness
18 Hemorrhagic shock
19 Cushing's syndrome
20 Dwarfism

HUMAN BIOCHEMISTRY

Human Biochemistry – Phase I M.B.B.S.

i) Goal :-

The broad goal of the teaching of undergraduate students in biochemistry is to make them understand the scientific basis of the life processes at the molecular level and to orient them towards the application of the knowledge acquired in solving clinical problems.

ii) Objectives :-

a) Knowledge

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

1) describe the molecular and functional organization of a cell and list its subcellular components;
2) delineate structure, function and inter-relationships of biomolecules and consequences of deviation from normal;
3) summarize the fundamental aspects of enzymology and clinical application wherein regulation of enzymatic activity is altered;
4) describe digestion and assimilation of nutrients and consequences of malnutrition;
5) integrate the various aspects of metabolism and their regulatory pathways;
6) explain the biochemical basis of inherited disorders with their associated sequelae;
7) describe mechanisms involved in maintenance of body fluid and pH homeostasis;
8) outline the molecular mechanisms of gene expression and regulation, the principles of genetic engineering and their application in medicine.
9) Summarize the molecular concept of body defences and their application in medicine;
10) Outline the biochemical basis of environmental health hazards, biochemical basis of cancer and carcinogenesis;
11) familiarize with the principles of various conventional and specialized laboratory investigations and instrumentation analysis and interpretation of given data;
12) suggest experiments to support theoretical concepts and clinical diagnosis;

b) SKILLS

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

1) make use of conventional techniques / instruments to perform biochemical analysis relevant to clinical screening and diagnosis;
2) analyze and interpret investigative data;
3) demonstrate the skills of solving scientific and clinical problems and decision making.

c) INTEGRATION

The knowledge acquired in biochemistry shall help the students to integrate molecular events with structure and function of the human body in health and disease.

1. Total no. of teaching hours allotted to Human Biochemistry – 240 hrs.

2. **Theory examination**:

There will be TWO papers, each of two and half hours duration. Each paper will be of 50 marks with one compulsory question on applied biochemistry.
Each paper will consist of FIVE questions.

3. Paper wise distribution of theory topics :
Structural formulae are not obligatory.

Paper- I (50 marks) 2 ½ hours duration.

1 Molecular and functional organization of a cell and its sub-cellular components.
2. Chemistry of enzymes and their clinical applications.
3. Chemistry and metabolism of proteins and related disorders.
4. Chemistry and metabolism of purines and pyrimidines and related disorders.
5. Chemistry and functions of DNA and RNA , Genetic code ; Protein biosynthesis &.regulation (Lac-operon)
6. The principles of genetic engineering and their applications in medicine.
7. Chemistry and Metabolism of haemoglobin.
8. Biological oxidation.
9. Molecular concept of body defence and their applications in medicine.
10. Vitamins and Nutrition.

PAPER - II (50 marks) 2 ½ hours duration.

1. Chemistry and metabolism of carbohydrates and related disorders.
2. Chemistry and metabolism of lipids and related disorders.
3. Mineral metabolism: Water and electrolyte balance & imbalance.
4. Acid base balance and imbalance.
5. Integration of various aspects of metabolism and their regulatory pathways. Starvation metabolism.
6. Mechanism of hormone action.
7. Environmental biochemistry.
8. Liver function tests, Kidney function tests, Thyroid function tests.
9. Detoxification mechanisms.
10. Biochemical basis of cancer and carcinogenesis.
11. Radioisotopes.
12. Investigation techniques : (LCD-Topics) Colorimeter, Electrophoresis, Chromatography & Flame photometer. PH measurement

5 NATURE OF QUESTION PAPER - Theory

Faculty with Year **:** ***FIRST MBBS***

Subject **:** **BIOCHEMISTRY**

Paper **:** ***I***

Total Marks **:** ***50*** ***Time*** **:** ***2 ½ Hours***

Section "A" (10 Marks)

Instructions:-

1) Fill (dark) the appropriate empty circle below the question number once only..
2) Use **blue/black** ball point pen only.
3) Each question carries **one / half mark.**
4) **Students will not be allotted mark if he/she overwrites strikes or put white ink on the cross once marked.**
5) Do not write anything on the blank portion of the question paper. If written anything, such type of act will be considered as an attempt to resort to unfair means.

Section "A" : MCQ (10 marks)

Question No.	Question Description	Division of Marks	Total Marks
1.	Total MCQs : 20	20 X ½	10

Section "B" & "C" (40 Marks)

Instructions:-

1) All questions are compulsory.
2) The number to the right indicates full marks.
3) Draw diagrams wherever necessary.
4) **Answer each section in the respective answerbook only. Answers written in the inappropriate sectional answer books will not be assessed in any case.**
5) Do not write anything on the blank portion of the question paper. If written anything, such type of act will be considered as an attempt to resort to unfair means.

Section "B" : SAQ (24 Marks)

Question No.	Question Description	Division of Marks	Total Marks
2.	**Brief answer questions (any six out of seven)** ***(two should be based on Applied Aspects)*** a) b) c) d) e) f) g)	6 X 4	24

Section "C" : LAQ (16 Marks)

Question No.	Question Description	Division of Marks	Total Marks
3.	**Solve any two out of three:** ***(Long answer question only)*** a) b) c)	2 X 8	16

Faculty with Year	***:***	***FIRST MBBS***
Subject	***:***	**BIOCHEMISTRY**
Paper	***:***	***II***
Total Marks	***:***	***50*** ***Time : 2 ½ Hours***

Section "A" (10 Marks)

Instructions:-

1) Fill (dark) the appropriate empty circle below the question number once only..
2) Use **blue/black** ball point pen only.
3) Each question carries **one / half mark.**
4) **Students will not be allotted mark if he/she overwrites strikes or put white ink on the cross once marked.**
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Instructions:-

1) All questions are compulsory.
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3) Draw diagrams wherever necessary.
4) **Answer each section in the respective answerbook only. Answers written in the inappropriate sectional answer books will not be assessed in any case.**
5) Do not write anything on the blank portion of the question paper. If written anything, such type of act will be considered as an attempt to resort to unfair means.

Section "B" : SAQ (24 Marks)

Question No.	Question Description	Division of Marks	Total Marks
2.	**Brief answer questions (any six out of seven)** ***(two should be based on Applied Aspects)*** a) b) c) d) e) f) g)	6 X 4	24

Section "C" : LAQ (16 Marks)

Question No.	Question Description	Division of Marks	Total Marks
3.	**Solve any two out of three:** ***(Long answer question only)*** a) b) c)	2 X 8	16

6. PRACTICAL :

Practical examination in Biochemistry will be of TWO hours duration 40 marks

B) Exercise

Q.1. : One quantitative experiment from group A 20 marks
(15 marks for expt. & 5 marks for table viva)

Q.2. : One qualitative/ quantitative experiment from group B.(10 marks for expt. & 5 marks for table viva 15 marks

Q.3. Spot identification from group C. 5 marks.

Group A :

Blood sugar, Blood urea; Serum total protein, Albumin and A/G ratio, Alanine amino transaminase(SGPT), Aspartate amino transaminase(SGOT) , Alkaline phosphatase, Serum amylase, Serum total bilirubin, Serum uric acid, Serum calcium, CSF sugar.

Group B :

Creatinine in urine, Serum cholesterol, Serum phosphorus, CSF protein, Tests for monosaccharides (Ben edict, Barfoed,Selivanoff, Nylander, rapid furfural) , Tests for disaccharides, Colour reactions of proteins, Precipitation reactions of proteins, Normal Organic constituents of urine, Abnormal constituents of urine, S. Creatinine.

Group C :

Identification of slide under microscope,
Use of reagent.
Significance of test.
Use of Instrument /Appliances.
Identification of Hb - derivative.
Identification of GTT , Electrophoretogram and chromatogram.

Candidate will be allowed to use flow chart for quantitative exercise only.
There will be table viva on Q.1 & Q.2 exercise.

(7). **SYLLABUS FOR PRACTICAL**

1. Tests for monosaccharides.
2. Tests for disaccharides.
3. Colour reactions of proteins.
4. Precipitation reactions of proteins.
5. Spectroscopic examination of Hb -derivatives (Oxy Hb; deoxy Hb; meth-Hb).
6. Estimation of blood sugar.
7. Estimation of blood urea.
8. Estimation of i) Serum creatinine, ii) Creatinine in urine..
9. Determination of serum total protein ,albumin and A/G ratio.
10. Estimation of total serum bilirubin.
11. Estimation of serum cholesterol.
12. Estimation of serum calcium.
13. Estimation of serum phosphorus (Inorganic)
14. Estimation of S.G.P.T(ALT).
15. Estimation of S.G.O.T (AST).
16. Estimation of serum alkaline phosphatase.
17. Estimation of serum amylase.
18. Urine ; Physical characteristics and normal constituents (organic)
19. Urine report; Physical characteristics and Abnormal constituents.
20. C.S.F.- Sugar & Protein.
21. Serum uric acid.

Lecture –cum- Demonstrations :

1. pH- measurement,
2. Colorimetry.
3. Electrophoresis.
4. Chromatography.
5. Flame photometry.

APPOINTMENT OF EXAMINERS:

There shall be at least four examiners. Out of whom not less than 50% must be an external examiners. Of the four examiners, the senior most internal examiner will act as Chairman/Convenor. The Chairman will make distribution of . Practical & viva-voce, so that all examiners will examine each candidate.

Theory.

Paper I.	50 marks.
Paper II.	50 marks.
TOTAL	100 marks.

Theory – viva.	20 marks (paper I & II – 10 marks each.)

Practical :

Q.1. Quantitative.	20 marks.
Q.2. Qualitative/Quantitative.	15 marks.
Q.3. Spotting.	5 marks.
Total	40 marks.

Internal assessment

Theory	20 marks.
Practical	20 marks.
Total	40 marks.

Standard of passing : A candidate must obtain 50% in aggregate with Minimum of 50% in theory & 35% in internal assessment is considered eligible to appear for theory examination. However for passing total 50% in aggregate .

DETAILS OF SYLLABUS FOR HUMAN BIOCHEMISTRY.
Structural formulae are not obligatory.
Must know:

1. **Chemistry of carbohydrates:** classification and biochemical importance, chemistry and functions of monosaccharides(excluding isomerism), disaccharides and polysaccharides including Glycosaminoglycans (mucopolysaccharides).

2. **Chemistry of Lipids:** classification and biological importance of triacyl glycerol, phospholipids, glycolipids, fatty acids (PUFA), prostaglandin, steroids and lipoproteins.

3. **Chemistry of proteins:** general nature of amino acids, various ways of classification of amino acids, biologically important peptides, classification, properties and biological importance of proteins. Structural

organization of proteins, Plasma proteins-functions, clinical significance of various fractions, methods of separation (only principle).

4. **Enzymes :** General nature, classification of enzymes, specificity and mode of action of enzymes, factors affecting enzyme activity. Enzyme inhibitions (Kinetic not required).Clinical importance (Diagnostic, therapeutic and as a Laboratory reagent) of enzymes and isoenzymes.

5. **Biological oxidation:** General concept of oxidation and reduction. Role of enzymes and co-enzymes. Electron transport chain. Substrate level and Oxidative phosphorylation, Role of uncouplers and inhibitors.

6. **Haemoglobin:** Chemistry and functions of haemoglobin . Types of normal and abnormal hemoglobins.(HbS, M,Thalassemia). Haemoglobin derivatives.

7. **Vitamins:** General nature, classification, sources,active forms and metabolic role, deficiency manifestations, daily requirement and hypervitaminosis.

8. **Nutrition:** Balance diet for normal adult, Quality of dietary protein, SDA, protein energy malnutrition (Kwashiorkor and Marasmus).

9. **Carbohydrate Metabolism:** Biochemical aspects of digestion and absorption of carbohydrates. Synthesis and break down of glycogen, Glycolysis, Rapoport Lumbering cycle, Citric acid cycle, Gluconeogenesis, HMP shunt pathway and its biological significance,Uric acid pathway (significance only). Metabolism of Galactose and Galactosemia. Blood sugar level and its regulation, oral GTT and glycosuria, Biochemistry of diabetes mellitus.

10. **Protein Metabolism:** Biochemical aspects of digestion and absorption of proteins. Fate of amino acid in the body (Deamination, Transmination, Transdeamination,Decarboxylation), Fates of ammonia (Urea cycle, glutamine formation), Metabolism of aromatic and sulphur containing amino acids and their inborn errors. Metabolism of Glycine.

11. **Lipid Metabolism:** Biochemical aspects of digestion and absorption of Lipids. Beta oxidation, biosynthesis of saturated fatty acids only, cholesterol biosynthesis, transport (role of HDL & LDL) Excretion, Ketogenesis, Ketolysis and Ketosis. Adipose tissue metabolism, Lipolysis and re-esterification, fatty liver and atherosclerosis.

12. **Chemistry and Metabolism of purines:**, nucleosides, nucleotides. Biologically important free nucleotides, Biosynthesis of purines(sources of ring & regulatory steps only, conversion of IMP to GMP & AMP) and salvage pathway, Biosynthesis of pyrimidines, Breakdown of purines and pyrimidines, Gout, Lesch- Nyhan Syndrome

13. Metabolic interrelationship of carbohydrates, lipids and proteins metabolism.

14. **Hormones :** General characteristics and Mechanism of hormone action. cAMP the second messenger, phosphotidyl inositol /calcium system as second messenger.

15. **Chemistry of nucleic acids:** structure and function of DNA and RNA, Genetic code, DNA Replication, Transcription, Translation, chain initiation, chain elongation , chain termination, Inhibitors of protein biosynthesis.

16. Molecular Mechanism of gene expression and regulation 1) Lac-operon model, Mutations.

17. **Mineral Metabolism :** Study of (i) Calcium and phosphorous (ii) sodium, potassium & chloride; (iii) magnesium, copper & iodine; (iv) Iron, (v) manganese, selenium, zinc & fluoride. Their importance in body in brief.

18 Water and electrolyte balance and imbalance.

19. Acid base balance and imbalance.

20 **Haemoglobin Metabolism :** Synthesis and break down of haemoglobin, porphyria (in brief), Fate of bilirubin, different types of Jaundice.

21 **Function tests:** (i) Liver function tests, (ii) Kidney function tests & (iii) Thyroid function tests.

22 **Detoxication mechanisms:** (Bio- transformation) oxidation, reduction, conjugation, hydrolysis.

Desirable to know :

1. Introduction of Biochemistry as a basic science for the study of medicine, It's importance in clinical practice.

2. Molecular and functional organization of a cell and its sub cellular components.

3. **Genetic engineering :** Recombinant DNA , Restriction endonuclease, Chimeric molecule, and Gene library. Applications of recombinant DNA technology in relation to medicine.

4. **Molecular concept of body defence and their applications:**
i) Immunoglobulins- structure & functions, ii) Free radicals, enzymatic and non-enzymatic antioxidants .

5. **Radioisotopes :** Uses of radioisotopes (therapeutic, diagnostic) and hazards.

6. Metabolic changes during starvation.

Nice to know:

1. **Environmental Biochemistry:** Definition, chemical stress, air & water pollution.

2. **Biochemistry of cancer** : carcinogens, and outline mechanism of carcinogenesis.

TOPICS OF THE LECTURES AND APPROXIMATE NUMBER OF LECTURES, HUMAN BIOCHEMISTRY - FIRST PHASE- M.B.B.S.
Lectures.

1.	Introduction to Biochemistry, Cell structure and function.	1
2.	Chemistry of Carbohydrates.	4
3.	Chemistry of Proteins.	4
4.	Chemistry of Lipids.	4
5.	Chemistry of Nucleo proteins.	2
6.	Enzymes.	6
7.	Biological oxidation.	2
8.	Chemistry and functions of Haemoglobin; abnormal haemoglobin.	2
9.	Carbohydrate Metabolism.	6
10.	Protein Metabolism.	6
11.	Lipid Metabolism.	6
12.	Integration of metabolism and metabolic changes during starvation.	2
13.	Mechanism of hormones action.	1
14.	Vitamins (Fat & Water soluble)	6
15.	Nutrition.	2
16.	Purines and Pyrimidine metabolism.	2

17.	Chemistry and functions of Nucleic acids.; Protein biosynthesis, Gene expression,mutations.	5
18.	Genetic engineering and it applications.	2
19.	Biochemistry of cancer.	1
20.	Radioisotopes.	1
21.	Haemoglobin metabolism, liver function tests,Detoxification mechanisms.	3
22.	Kidney function tests,Thyroid function tests	2
23.	Mineral Metabolism.	4
24.	Water and Electrolyte Balance.	2
25.	Acid base balance,	2
26.	Environmental Biochemistry.	1
27.	Molecular concept of body defence.	2

BOOKS RECOMMENDED:

TEXT BOOKS ;

1. Medical Biochemistry - U.Satyanarayan.
2. Biochemistry for Medical students by D.M.Vasudevan & Shree Kumari.
3. Medical Biochemistry by M.N. Chatterjea and Rana Shinde.
4. Text Book of Medical Biochemistry by Ramakrishnan, Prasannan & Rajan.
5. Medical Biochemistry by Debajyoti Das.
6. Biochemistry by A.C.Deb.

REFERENCE BOOKS:

1. Biochemistry by Pankaja Naik
2. Harper's Biochemistry.
3. Medical Biochemistry by N.V.Bhagwan.
4. Biochemistry by L.Stryer.
5. Biochemistry by Orten & Neuhans.

Annexure 1A2

Introduction of "Communication Skills, Professionalism & Ethics in Medical Education Modules" in 2nd Year MBBS Syllabus
New Topic in Syllabus of Pathology (A.Y. 2015-16)

Curricula for II M.B.B.S.

Pathology

1. Goal

The goal of teaching pathology is to provide undergraduate students comprehensive knowledge of the causes and mechanisms of disease, in order to enable them to achieve complete understanding of the natural history and clinical manifestations of the disease.

2. Educational objectives

(a) Knowledge

At the end of one and half years, the student shall be able to -

i. describe the structure and ultrastructure of a sick cell, the mechanisms of the cell degradation, cell death and repair.
ii. Correlate structural and functional alterations in the sick cell.
iii. Explain the Patho physiological processes which governs the maintenance of homeostasis, mechanism of their disturbances and the morphological and clinical manifestation associated with it.
iv. describe the mechanisms and patterns of tissue response to injury to appreciate the Pathophysiology of disease processes and their clinical manifestations.
v. Correlate the gross and microscopic alterations of different organ systems in common diseases to the extent needed to understand disease processes and their clinical significance.
vi. Develop an understanding of neoplastic change in the body in order to appreciate need for early diagnosis and further management of neoplasia.
vii. Understand mechanisms of common haematological disorders and develop a logical approach in their diagnosis and management.

(b) Skills

At the end of one and half years, the student shall be able to -

i. Describe the rationale and principles of technical procedures of diagnostic laboratory tests.
ii. Interpret diagnostic laboratory tests and correlate with clinical and morphological features of diseases.
iii. Perform simple bedside tests on blood, urine and other biological fluid samples.
iv. Draw a rational scheme of investigations aimed at diagnosing and managing common disorders.
v. Recognise morbid anatomical and histopathological changes for the diagnosis of common disorder.

(c) Integration

At the end of one and half years, the student shall be able to integrate the causes and mechanisms of disease most prevalent in India with their natural history for the understanding of their clinical course and management.

3. Total duration of teaching 3 Semesters (III, IV and V)
Minimum 315
working days.

Total number of teaching hours allotted to the discipline **300 hrs**

Distribution of teaching hours

A) Theory (lectures & tutorials) …..101
….. 58
Total …..159

B) Practicals …..110

C) Revision & Evaluation (Internal) ……31

4. Syllabus

a. ***Learning methods***

Distribution of teaching hours

DIVISIONS	**A) LECTURES**	**B) TUTORIALS**	**C) PRACTICALS**
	(1 hr)	(2 hrs)	(2 1/2 hrs)
1. General Pathology	35	07	12
2. Haematology	15	04	07
3. Systemic Pathology	47	13	18
4. Clinical Pathology	03	04	05
5. Autopsy	01	01	02
TOTAL	101	29x2	44x2.5

b. & c. Sequential organization of course contents

The Broad area of study shall be:-

General Pathology (including general neoplasia)
Systemic Pathology (including systemic neoplasia)
Haematology
Clinical Pathology

A) GENERAL PATHOLOGY : (n=35)

1. Definitions and causes of diseases:-

Must know**:-** Able to recall common definitions in Pathology and causes of cell injury.

2. Modes of cell injury:-

Must know**:-** Able to appreciate mechanisms of cell injury & relate them to the morphological changes.

3. Necrosis & gangrene:-

Must know**:-** Able to recognize types of necrosis and gangrene at gross and microscopic levels.

Desirable to know**:-** Apoptosis and its relevance.

4. Intracellular accumulations and alterations:-

Must know**:-** Able to list the types of intracellular accumulations & alterations in reversible cell injury along with alterations in cell organelles and cytoskeleton.

5. Cellular Adaptations/ Growth disturbances:-

Must know**:-** Define the various growth disturbances and appreciate the clinical significance of each.

6. Acute inflammation:-

Must know**:-** Define and describe changes occurring in acute inflammation and integrate the changes with morphological patterns of injury.

7. Chemical mediators of Inflammation:-

Must know**:-** Definition, Classification, description of each type, role of acute chronic inflammation.

8. Chronic inflammation (including granulomatous):-

Must know**:-** differentiate it from acute inflammation, describe aetiology, patterns and systemic effects of granulomas.

9. Regeneration and repair (general):-

Must know**:-** Define & describe regeneration and repair and understand the mechanisms and list factors modifying repair.

10. Repair in specialized tissues:-

Must know**:-** Describe repair in fractures and parenchymal organs and list modifying factors and complications.

11. Oedema:-

Must know**:-** Define oedema, classify and describe pathogenesis & correlate morphology with clinical significance with emphasis on transudate and exudate.

12. Shock:-

Must know**:-** Define, classify and understand pathogenesis, recognize the of mediators and stages of shock.

13. Thrombosis:-

Must know**:-** Describe etio-pathogenesis, fate, morphology and effects of thrombosis.

14. Embolism and Infarction:-

Must know**:-** Enumerate types of embolism and infarction, recognize morphological changes and correlate clinical significance.

15. Hyperaemia and Haemorrhage:-

Must know**:-** Definitions, morphology of acute and chronic congestions, clinical significance of haemorrhage.

16. Disturbances of pigment metabolism:-

Must know**:-** State the type of pigment disturbances and describe the changes associated with common disturbances like lipofuscin, melanin, Hemosiderin and Bilirubin.

17. Disturbances of Mineral metabolism:-

Must know**:-** Describe the types and morphological changes of calcification.
Desirable to know**:-** Disturbances of other minerals like zinc etc.

18. Genetic disorders:-

Must know**:-** Normal karyotype, classification of genetic disorders, types of genetic change, Down's syndrome, Klinefelter's syndrome, Turner's syndrome
Desirable to know**:-** Lysosomal storage disorders, glycogen storage diseases, methods of disease diagnosis.

19. Hypersensitivity reactions:-

Must know**:-** Classify, differentiate between different types of Hypersensitivity reactions.
Desirable to know**:-** Be conversant with transplant rejections.

20. Autoimmune diseases:-

Must know**:-** Understand mechanisms of autoimmunity and diagnose common autoimmune diseases; overview of SLE.

21. Amyloidosis:-

Must know**:-** Definition, physical characters, chemical characters, classification, pathogenesis morphology, clinical correlation and lab diagnosis.

22. AIDS:-

Must know**:-** Understand the natural history of the disease and recommend relevant investigations in the management.

23. Typhoid fever:-

Must know**:-** Correlate Pathogenesis with morphology and clinical features of the disease.

24. Syphilis:-

Must know**:-** Classify and describe lesions in various stages of syphilis

25,26,27 (3 lectures) Tuberculosis:-

Must know**:-** Appreciate the importance of tuberculosis in the present day Context, its Pathogenesis & basic histopathology. List and describe the various pulmonary lesions of tuberculosis. Describe changes in various organs in TB and understand their functional correlation, sequelae, lab diagnosis and TB in AIDS.

28. Leprosy:-

Must know**:-** Classify, differentiate between different types of leprosy and describe the diagnostic histologic features and sequelae.

29. Fungal diseases:-

Desirable to know**:-** Classification and be conversant with relevance of fungal diseases in the world with emphasis on opportunistic fungal infections.

30. Malaria:-

Must know**:-** Identify, morphological features in vivax and falciparum malaria and recommend lab investigations in the management.

31 & 32. Neoplasia - Nomenclature and classification:-

Must know**:-** Define important terms, classify and differentiate benign from malignant neoplasms.

Desirable to know**:** Precancerous conditions

33. Neoplasia - Carcinogenesis:-

Must know**:-** Understand carcinogenesis and analyse the mechanism of genetic changes in carcinogenesis.

34. Neoplasia - Biology and Lab diagnosis:-

Must know**:-** Understand the tumour host interactions in neoplasia and recommend the diagnostic workup for detection of cancer.

35. Neoplasia - Spread, grading and staging:-

Must know**:-** Biology of tumour growth, metastases, types, mechanisms, clinical correlations, grading of cancer and staging of cancer.

B) HAEMATOLOGY : (n=15)

1. Introduction to haematology and hemopoiesis:-

Must know**:-** Understand the importance of haematology in clinical practice and enumerate the stages of hemopoiesis.

2. Anaemias (general):-

Must know**:-** Definition, classify anaemia by various methods, clinical features and lab approach to anaemias.

3. Iron deficiency anaemia:-

Must know**:-** Definition, causes, haematological features, morbid anatomical features, laboratory diagnosis and differential diagnosis.

4. Megaloblastic anaemia:-

Must know**:-** Definition, causes, haematological features, morbid anatomical features, laboratory diagnosis and differential diagnosis.

5. Haemolytic anaemia:-

Must know**:-** Definition, classification, Pathogenesis and haematological features.

6. Haemoglobinopathies:-

Must know**:-** Definition, classification, Lab diagnosis of Thalassaemia and Sickle cell anaemia.

7&8. Haemorrhagic disorders:-

Must know**:-** Classify haemorrhagic disorders, describe clinical distinction between Purpuras and Coagulation disorders and laboratory screening tests for haemorrhagic disorders. Normal coagulation and fibrinolytic mechanism. Describe etio-pathogenesis, clinical significance and lab diagnosis of haemophilia and DIC.Describe etio-pathogenesis, morphological features (haematological and morbid anatomical) clinical significance and lab diagnosis of ITP.

9. Leukocytic disorders:-

Must know**:-** Leukocytosis, Leukopenia and Leukemoid reactions.

10. Acute Leukaemias:-

Must know**:-** Classify and differentiate different types of acute Leukaemias.

11. Chronic Leukaemias:-

Must know**:-** Definition, general features, classification, aetiology, haematological change, morbid anatomy, clinical course and lab. investigations.

12. Paraproteinemia:-

Desirable to know**:-** Understand the relevance of paraproteinemia‟s and integrate the various diagnostic modalities with the diagnosis.

13. Aplastic Anaemias:-

Desirable to know**:-** Aplastic anaemias and Agranulocytosis.

14. Blood groups:-

Must know**:-** Appreciate the relevance of blood groups in haematology and transfusion medicine. Erythroblastosis foetalis

15. Blood Transfusion:-

Must know**:-** Indications, selection of blood donors, autologous transfusions, complications of blood transfusions, investigation of suspected transfusion reactions.

C) SYSTEMIC PATHOLOGY : (n=46)

1. Atherosclerosis:-

Must know**:-** Definition, etiopathogenesis, gross and microscopic description, complications and clinical correlation.

2. Hypertension:-

Must know**:-** Relate the mechanisms of the disease to the clinical course and sequelae.

3. Other diseases of blood vessels:-

Must know**:-** Develop an index of suspicion for vasculitides and aneurysms.

4. Ischaemic heart disease:-

Must know**:-** Incidence, risk factors, Pathogenesis, morphological changes, clinical course, complications and investigations.

5. Congenital heart disease:-

Desirable to know**:-** Correlate the anatomical malformations of disorders to the clinical consequences of the disease.

6. Rheumatic heart disease:-

Must know**:-** Incidence, etiopathogenesis, morbid anatomy, histopathology, lesions in the organs, clinical course and sequelae.

7. Endocardial and pericardial diseases:-

Must know**:-** Infective endocarditis - Pathogenesis, morphology, differential diagnosis of cardiac vegetations, aetiology and basic morphology of different forms of pericarditis.

8. Cardiomyopathies:-

Desirable to know**:-** Recognize the disorders as part of differential diagnosis in primary myocardial diseases.

9. Pneumonias:-

Must know**:-** Aetiology, classification, gross, histopathological description in different forms and complications.

10. Lung Abscess and Bronchiectasis:-

Must know**:-** Etiopathogenesis, morphological appearances and complications.

11. Chronic Bronchitis and Emphysema:-

Must know**:-** Pathogenesis, types of emphysema, definition of chronic bronchitis, morbid anatomy and cardiac sequelae.

12. Occupational lung diseases:-

Must know**:-** Types, etiopathogenesis, gross anatomical differences between different forms and sequelae.

13. Tumours of lung and pleura:-

Must know**:-** Classification, aetiology, gross appearances, histological description of important forms, natural history, pattern of spread, Para neoplastic syndromes and secondary Pathology.

14. Lesions of oral cavity and salivary glands:-

Must know**:-** Differential diagnosis of swelling of salivary glands, oral cancer - etiopathogenesis, gross and histopathological descriptions.

15. Gastritis and Peptic Ulcer:-

Must know**:-** Definition of peptic ulcer, etiological factors, gross and microscopic appearances and sequelae.

Desirable to know**:-** Overview of aetiology and types of gastritis.

16. Ulcers of Intestines:-

Must know**:-** Etiological classifications, Morphological appearances of typhoid, tubercular, amoebic ulcers and bacillary dysentery. Differential diagnosis of different forms of ulcers.

17. Idiopathic Inflammatory Bowel disease:-

Must know**:-** Enumerate similarities and differences between the two component disorders viz., Crohn's disease and ulcerative colitis.

18. Tumours of upper GIT:-

Must know**:-** Etiopathogenesis, morphological features of carcinoma oesophagus, classification and morbid anatomy and histopathology of gastric carcinomas.

Desirable to know**:-** Overview of carcinoid tumours of GIT.

19. Tumours of lower GIT:-

Must know**:-** Pathology of carcinoma colon.

Desirable to know**:-** Intestinal polyps & GI stromal tumours.

20. Viral Hepatitis:-

Must know**:-** Aetiology, clinical source and enzymology, salient histological features and sequelae.

21. Alcoholic liver disease:-

Must know**:-** Pathogenesis, morphological manifestations and correlation with clinical features.

22. Cirrhosis:-

Must know**:-** Etiopathogenesis, classification, important histological features and differential diagnosis.

23. Tumours of liver, Pancreas and gall bladder:-

Must know**:-** Pathology of Hepatocellular carcinoma.

Desirable to know**:-** Pathology of tumours of Pancreas and gall bladder.

24. Diabetes mellitus:-

Must know**:-** Classification, pathogenesis of system involvement, sequelae and complications.

25. Acute nephritis and rapidly progressive GN:-

Must know**:-** Understand and integrate clinical and pathologic features of these syndromes.

26. Nephrotic syndrome:-

Must know**:-** Integrate clinical and pathological features of this disorder.

27. Renal failure:-

Must know**:-** Definitions, criteria, aetiology, systemic manifestations and investigations.

28. Pyelonephritis and interstitial Nephritis:-

Must know**:-** Aetiology, Pathogenesis of Pyelonephritis acute and chronic morphological features and clinical correlation.

29. Tumours of kidney and Pelvis:-

Must know**:-** Classification, Morphological features, clinical course including Para neoplastic syndromes of common tumours.

30. Tumours of testis and Prostate:-

Must know**:-** Classification, salient morphological features of most common tumours and clinical course.

31. Tumours of Cervix and Uterus:-

Must know**:-** Etiopathogenesis, salient morphological features, dysplasia and role of cytological screening.

32. Tumours of Ovary and trophoblastic tissue:-

Desirable to know**:-** Classification and morphological description of important types.

33. Non-neoplastic and Neoplastic lesions of the breast:-

Must know**:-** Classification, morphological features and grading of carcinoma breast and differential diagnosis of breast swellings.

34. Non-neoplastic lesions of lymph nodes and Spleen:-

Must know**:-** Aetiology, differential diagnosis, morphological features of common causes of lymphadenopathy, common causes and appearances of splenomegaly.

35. Hodgkin's Lymphoma:-

Must know**:-** Definition, classification, salient diagnostic features and clinical course.

36. Non-Hodgkin's Lymphoma:-

Must know**:-** Definition, classification, salient diagnostic features and clinical Correlation.

Desirable to know**:-** Extra nodal lymphomas.

37. Tumours of skin - Non-pigmented:-

Must know**:-** Classification, morphological features of most common types and natural history.

38. Tumours of skin - Pigmented:-

Must know**:-** Classification, morphological features of common naevi, natural history of malignant melanoma.

39 &40. Soft tissue tumours :-

Must know**:-** Classification, morphological features of lipomatous, fibrous and blood vessel tumours. Morphological features of neural, muscle and fibro histiocytic tumours.

41. Non-neoplastic lesions of bone and joints:-

Must know**:-** Etiopathogenesis and morphological changes of common arthritis and osteomyelitis.

42 & 43. Tumours of bone, cartilage and joints:-

Must know**:-** Classification, radiological and pathological features of important bone tumours (Osteosarcoma, Osteochondroma, GCT and Ewing's sarcoma).

44. Inflammatory and neoplastic conditions of CNS:-

Must know**:-** Morphological features and differential diagnosis of meningitis.

Desirable to know**:-** Classification, morphological features of important CNS tumours, clinical course and sequelae (Meningioma and Gliomas).

45. Lesions of Thyroid:-

Must know**:-** Differential diagnosis of thyroid nodule.

46. Myopathies:-

Desirable to know**:-** Differential diagnosis of common muscle disorders.

D) CLINICAL PATHOLOGY : (n=3)

1. Differential diagnosis of Jaundice:-

Must know**:-** The differential diagnosis and laboratory investigations in jaundice

2. Renal function tests:-

Must know**:-** Laboratory approach to a case of renal dysfunction

1. Diabetes mellitus:-

Must know:- Laboratory diagnosis of Diabetes mellitus

E) AUTOPSY : (n=1)

Must know:- Indications and techniques of medical autopsies

Tutorials

GENERAL PATHOLOGY:

1. Cell injury and cell death
2. Cellular accumulations
3. Inflammation and repair
4. Circulatory disturbances
5. Immunological disorders
6. Infections
7. Neoplasia

HAEMATOLOGY:

1. Anaemias
2. Leukaemias
3. Interpretation of haematological case charts and identification of instruments
4. Haemorrhagic disorders

SYSTEMIC PATHOLOGY:

1. Atherosclerosis and IHD
2. Rheumatic heart disease
3. Pneumonias
4. Tumours of lung
5. Oral cancer
6. Peptic Ulcer
7. Cirrhosis
8. Glomerulonephritis
9. Carcinoma Breast
10. Carcinoma Cervix
11. Bone Tumours
12. Museum specimens
13. Museum specimens

CLINICAL PATHOLOGY:
1. Glucose Tolerance Test
2. Renal Function Tests
3. Differential Diagnosis of Meningitis
4. Identification of needles and instruments used in clinical pathology

AUTOPSY:
CPC of common diseases like 1. Tuberculosis 2. Myocardial infarction 3. Carcinoma/sarcoma 4. Hypertension by students (2 or 3)

d. Term-wise distribution

1st term: 1. General Pathology 2. General Neoplasia 3. Haematology & Transfusion Medicine
2nd term: 1. Systemic Pathology 2. Systemic Neoplasia 3. Clinical Pathology
3rd term: Tutorials & Revision.

e. Practicals: Total hours, number & contents

Total hours : 110 Number : 44

Contents :

A) GENERAL PATHOLOGY: (n=12)

1. Microscopy and tissue processing
2. Identify the common types of cells by light microscopy
3. Intracellular accumulation
4. Acute inflammation
5. Chronic inflammation and Repair
6. Thrombosis, embolism, infarction and gangrene
7. Oedema and congestion
8. Disturbances of pigment metabolism
9. Tuberculosis
10. Leprosy
11. Amyloidosis
12. Disturbances of growth (Atrophy, hypertrophy, hyperplasia, metaplasia, Dysplasia, hypoplasia)

B) HAEMATOLOGY: (n=7)
1. Collection of specimen, anticoagulants and common haematological tests (Hb)
2. Common Haematological Counts (TLC, DLC) & Interpretation of ESR
3. Haemopoiesis
4. Investigations in Anaemia
5. Investigations in Leukaemia
6. Investigations in haemorrhagic disorders
7. Blood Banking

C) SYSTEMIC PATHOLOGY: (n=18)

1. Diseases of blood vessels (Atherosclerosis, syphilitic aortitis)
2. Diseases of Heart (IHD & RHD)
3. Pneumonias
4. Tumours of lung
5. Diseases of kidney
6. Gross and Microscopic features of peptic ulcer and duodenal ulcer
7. Gross and Microscopic features of other intestinal ulcers
8. Tumours of GIT
9. Diseases of Liver
10. Lymphomas
11. Diseases of male and female genital system

12 &13. Tumours of breast

14. Tumours of skin (Pigmented)
15. Tumours of skin (non-pigmented)
16. Soft tissue tumours
17. Tumours of bone
18. Diseases of thyroid

D) CLINICAL PATHOLOGY: (n=5)

1. Urine RE - Carryout a bedside routine urine examination and interpret the results.
2. Pregnancy test and Semen Analysis - (Practical demonstration).
3. Common cytological preparations (lecture demonstration).
4. CSF examination.
5. Serous effusion examination.

E) AUTOPSY: (n=2)

1 & 2) To study and describe five autopsy reports.

For the batches joining in June 2001 and later

List of Slides and Specimens that should be shown during the Pathology Practical Classes

These are grouped under two headings: The students

1) must see (M)
2) desirable to see (D)

Please note that this will be applicable for the batch which will be joining Pathology term in June / July 2001 and later.

DRAWING SLIDES:

HISTOPATHOLOGY:

1. Kidney cloudy change (M)
2. Fatty change liver (M)
3. Uterus - leiomyoma with hyaline change (M)
4. Kidney - amyloid (M)
5. Lymph node - caseous necrosis (M)
6. Kidney - infarct (Coagulation necrosis) (M)
7. Acute ulcerative appendicitis (M)
8. Pyogenic meningitis (M)
9. Lepromatous leprosy - skin (M)
10. Tuberculoid leprosy - skin (M)
11. Actinomycosis (M)
12. Granulation tissue (M)
13. Ileum - typhoid ulcer (M)
14. Tuberculous lymphadenitis (M)
15. Amoebic colitis (M)
16. Lung - haemosiderin pigment or CPC (M)
17. Liver - CPC (M)
18. Artery - recent / organised thrombus (M)
19. Hashimoto's thyroiditis (D)
20. Skin - papilloma (M)
21. Squamous cell carcinoma (M)
22. Adenocarcinoma - Colon (M)
23. Lymph node - metastasis (M)
24. Skin - capillary haemangioma (M)
25. Cavernous haemangioma (M)
26. Benign cystic teratoma (Dermoid cyst) (M)
27. Stomach - chronic peptic ulcer (M)
28. Liver - Viral hepatitis (Massive/ sub-massive necrosis) (D)
29. Liver- portal and biliary cirrhosis (M)
30. Lung - lobar and broncho pneumonia (M)
31. Lung - fibrocaseous tuberculosis (M)
32. Heart - rheumatic myocarditis (D)
33. Heart - healed infarct (M)
34. Aorta - atherosclerosis (M)
35. Kidney - crescentic glomerulonephritis (M)
36. Kidney - chronic glomerulonephritis (M)
37. Kidney - chronic pyelonephritis (M)
38. Kidney - RCC (D)
39. Benign prostatic hyperplasia (M)
40. Testis - seminoma (M)
41. Uterus - leiomyoma (M)
42. Products of conception (M)
43. Hodgkin's lymphoma (M)
44. Brain - tuberculous meningitis (M)
45. Brain - meningioma (D)
46. Bone - osteogenic sarcoma (M)
47. Bone - chondroma (M)
48. Bone - osteoclastoma (M)

49. Skin - melanoma and nevus (M)
50. Breast - fibroadenoma (M)
51. Breast - carcinoma (M)
52. Thyroid - colloid goitre (D)
53. Thyroid - papillary carcinoma (D)
54. Skin - basal cell carcinoma (M)

HAEMATOLOGY:

1. Acute blast cell leukaemia (M)
2. Chronic myeloid leukaemia (M)
3. Eosinophilia (M)
4. Iron deficiency anaemia (M)
5. Haemolytic anaemia (M)
6. Macrocytic anaemia (M)
7. Leucocytosis (M)
8. Various biochemical charts - LFT , GTT , CSF, etc (M)

LIST OF SPECIMEN:

1. Cell injury and adaptation (Degeneration)

a) Liver - fatty change (M)
b) Kidney - cloudy change (M)
c) Aorta - atheroma (M)
d) Atheroma with calcification (D)
e) Kidney stones (M)

2. Amyloidosis

a) Kidney - amyloidosis (M)
b) Spleen - amyloidosis (M)

3. Necrosis and Gangrene

a) Kidney - infarct (M)
b) Spleen - infarct (M)
c) Intestine - gangrene (M)
d) Foot - gangrene (M)
e) Lymph node - caseation (M)

4. Acute inflammation

a). Lobar pneumonia (M)
b) Kidney - abscess (D)
c) Liver - abscess (D)
d) Mycetoma - foot (D)
e) Acute appendicitis (M)
f) Purulent meningitis (M)
g) Fibrinous pericarditis (M)

5. Chronic inflammation

a) Syphilitic aortitis (D)

6. Repair

a) Heart - healed infarct (M)

7. Specific inflammation

a) Ileum - typhoid (M)
b) Amoebic colitis (M)
c) Amoebic liver abscess (M)

8. Chronic specific granulomatous inflammation

a) Intestine - TB ulcer (M)
b) Brain - TB meningitis (M)
c) Lymph node - TB (M)
d) Lung - miliary TB (M)
e) Fibrocaseous TB (M)

9. Pigment disorders

a). Liver and spleen - Prussian blue reaction (D)
b). Liver and spleen - malaria (M)
c). Skin - melanoma (any site) (M)

10. Disorders of vascular flow and shock

a). Liver - CPC (M)
b). Lung - CPC (M)

11. Thrombosis embolism and infarction

a) Thrombus - artery / vein (M)
b) Infarction - kidney / spleen / brain (M)
c) Intestine gangrene (M)

12. Immunopathology

a) Heart - Rheumatic carditis (M)
b) Kidney - acute glomerulo nephritis (M)
c) Thyroid - Hashimoto's thyroiditis (D)

13. Growth disorders

a) Heart - LVH (M)
b) Kidney - atrophy and compensatory hypertrophy (M)

c) Kidney - Hydronephrosis (M)

14. Neoplasm

a) Papilloma skin (M)
b) Adenomatous polyp (M)
c) Fibroadenoma - breast (M)
d) Squamous cell carcinoma - skin (M)
e) Adenocarcinoma - colon (M)
f) Metastasis - lung (M)
g) Leiomyoma - uterus (M)
h) Soft tissue - lipoma (M)
j) Haemangioma - any site / type (M)
k) Melanoma (M)
l) Dermoid cyst (M)
m) Teratoma (M)

15. Alimentary System

a) Oesophagus carcinoma (M)
b) Stomach - chronic peptic ulcer (M)
c) Perforated peptic ulcer (M)
d) Stomach - carcinoma (linitis plastica) (M)
e) Intestine - TB ulcer (M)
f) Colon - Amoebic colitis / bacillary colitis / carcinoma ulcerative / carcinoma
polypoidal growth (M)

16. Liver

a) Acute diffuse necrosis (D)
b) Amoebic abscess (M)
c) Micronodular / macronodular / mixed cirrhosis (M)
d) Hepatoma (M)
e) Metastasis (M)

17. Respiratory system

a) Lung - lobar / bronchopneumonia (M)
b) Bronchogenic carcinoma (M)
c) Lung - abscess (D)
d) Fibrocaseous TB (M)

18. Cardiovascular System

a). Rheumatic endocarditis (D)
b) Fibrinous pericarditis (M)
c) Mitral stenosis (M)
d) Aortic stenosis (M)
e) Bacterial endocarditis (M)
f) Recent myocardial infarct (D)
g) Healed myocardial infarct (M)
h) Atheroma aorta (M)
j) Atheroma with complications (M)

19. Urinary System

a) Flea bitten kidney (M)
b) Large white kidney (M)
c) Shrunken granular kidney (M)
d) Acute pyelonephritis (M)
e) RCC (D)
f) Wilm's tumour (D)
g) Papillary carcinoma - Urinary bladder (D)

20. Male Reproductive System

a) SCC - penis (M)
b) Seminoma - testis (M)
c) Teratoma - testis (M)
d) Benign prostatic hyperplasia (M)

21. Female Reproductive System

a) Uterus - leiomyoma (M)
b) Carcinoma cervix (D)
c) Ovary - cyst adenocarcinoma (D)
d) Ovary - dermoid cyst (D)

21. Lymphoreticular System

a) Lymph node - TB Lymphadenitis (M)
b) Lymph node - lymphoma (M)
c) Spleen - infarct (M)

22. Central Nervous System

a) Brain - purulent meningitis (M)
b) Brain - tuberculous meningitis (M)
c) Tuberculoma (D)
d) Meningioma (D)
e) Glioma (D)
f) Haemorrhage - CVA (D)

23. Bone lesions

a) Chronic osteomyelitis (D)
b) Osteoclastoma (M)
c) Osteogenic sarcoma (M)
d) Multiple myeloma (D)

24. Skin lesions

a) Squamous cell carcinoma (M)
b) Basal cell carcinoma (D)
c) Melanoma - skin (any site) (M)

25. Diseases of Endocrine organs

a) Breast - fibroadenoma (M)
b) Breast - carcinoma (M)
c) Thyroid - multinodular goitre (M)
d) Thyroid - solitary nodule / adenoma (M)

f. Books recommended:
a) Text book of Pathology by Robbins
b) Text book of General Pathology Part I & II by Bhende and Deodhare
c) Clinical Pathology by Talib
d) Text book of Pathology by Harsh Mohan
e) Text book of Pathology by Muir
f) Haematology De Gruchi
g) IAPM text book of Pathology

Reference books:
a) Anderson's text book of Pathology Vol I & II
b) Oxford text book of Pathology Vol. I, II & III
c) Pathology by Rubin and Farber
d) Pathologic basis of Disease Robbins

5. Evaluation

☋☞ ***Methods***
Theory, Practicals and Viva
♌☞ ***Pattern of Theory Examination including Distribution of Marks, Questions, Time.***

Nature of Question Paper

Faculty with Year : ***SECOND MBBS***

Subject : **PATHOLOGY**

Paper : ***I***

Total Marks : ***40*** ***Time*** : ***2 Hours***

Section "A" (8 Marks)

Instructions:-

1) Fill (dark) the appropriate empty circle below the question number once only..
2) Use **blue/black** ball point pen only.
3) Each question carries **one / half mark.**
4) **Students will not be allotted mark if he/she overwrites strikes or put white ink on the cross once marked.**
5) Do not write anything on the blank portion of the question paper. If written anything, such type of act will be considered as an attempt to resort to unfair means.

Section "A" : MCQ (8 marks)

Question No.	Question Description	Division of Marks	Total Marks
1.	Total MCQs : 16	16 X ½	08

Section "B" & "C" (32 Marks)

Instructions:-

1) All questions are compulsory.
2) The number to the right indicates full marks.
3) Draw diagrams wherever necessary.
4) **Answer each section in the respective answerbook only. Answers written in the inappropriate sectional answer books will not be assessed in any case.**
5) Do not write anything on the blank portion of the question paper. If written anything, such type of act will be considered as an attempt to resort to unfair means.

Section "B" : BAQ (20 Marks)

Question No.	Question Description	Division of Marks	Total Marks
2.	**Brief answer questions** **(Attempt any five out of six)** a) b) c) d) e) f)	5 X 4	20

Section "C" : LAQ (12 Marks)

Question No.	Question Description	Division of Marks	Total Marks
3.	**Attempt any two out of three:** ***Long answer question only*** a) b) c)	2 X 6	12

Faculty with Year **:** ***SECOND MBBS***

Subject **:** **PATHOLOGY**

Paper **:** ***II***

Total Marks **:** ***40*** ***Time*** **:** ***2 Hours***

Section "A" (8 Marks)

Instructions:-

1) Fill (dark) the appropriate empty circle below the question number once only..
2) Use **blue/black** ball point pen only.
3) Each question carries **one / half mark.**
4) **Students will not be allotted mark if he/she overwrites strikes or put white ink on the cross once marked.**
5) Do not write anything on the blank portion of the question paper. If written anything, such type of act will be considered as an attempt to resort to unfair means.

Section "A" : MCQ (8 marks)

Question No.	Question Description	Division of Marks	Total Marks
1.	Total MCQs : 16	16 X ½	08

Section "B" & "C" (32 Marks)

Instructions:-

1) All questions are compulsory.
2) The number to the right indicates full marks.
3) Draw diagrams wherever necessary.
4) **Answer each section in the respective answerbook only. Answers written in the inappropriate sectional answer books will not be assessed in any case.**
5) Do not write anything on the blank portion of the question paper. If written anything, such type of act will be considered as an attempt to resort to unfair means.

Section "B" : BAQ (20 Marks)

Question No.	Question Description	Division of Marks	Total Marks
2.	**Brief answer questions** **(Attempt any five out of six)** a) b) c) d) e) f)	5 X 4	20

Section "C" : LAQ (12 Marks)

Question No.	Question Description	Division of Marks	Total Marks
3.	**Attempt any two out of three:** ***Long answer question only*** a) b) c)	2 X 6	12

<u>Direction:-</u> Only short answer questions may be permitted from the portions marked as "Desirable to know"

c. Paper wise distribution of theory topics and number of questions:-

A)
Paper I:- General Pathology inclusive of general neoplasia
Haematology inclusive of transfusion medicine.

Out of 3 LAQs in Section C, 2 questions should be from General Pathology and General Neoplasia and one question should be from Haematology inclusive of transfusion medicine.

B)

Paper II:- Systemic Pathology inclusive of systemic Neoplasia and Clinical Pathology.

Out of 3 LAQs in Section C, 2 questions should be from Systemic Pathology and Systemic Neoplasia and one question should be from Clinical Pathology.

d. Marking scheme

Each paper of 40 marks as shown in the above table.

e. Nature of practicals and duration

<u>Practicals</u>	**Marks 26**
a. 10 Spots 2 minutes each (4 specimen, 1 instrument, 3 histopathology slides, 1 haematology slide and 1 chart) Identification - 1/2 mark Specific short question - 1/2 mark together 1 mark for each spot	10
b. Urine Examination - Physical and two abnormal constituents	05
c. Histopathology slides : Diagnosis and discussion	03
d. Haematology examination	
i) Peripheral blood smear stain and report	03
ii) Hb/TLC/Blood group	05
Total	26

f. Viva : duration and topic distribution

Viva consists of two tables; on each table the student will face 2 examiners for 5 minutes each :

Table - I General and Systemic Pathology - 7 marks

Table - II Clinical Pathology and Haematology - 7 marks

Total 14 marks

Number of Students for Practical Examination should not exceed more than 30 / day

(4 for general Pathology, 4 for Systemic Pathology, 7 for Clinical Pathology including hematology)

g. Plan for internal assessment

The time table for internal assessment will be as follows :

Theory	15
Practical	15

Scheme of internal assessment

From the batches which have joined before June 2001

Examination Head	**Semester/term wise distribution**	**Total No of marks**
Theory	III Semester	
	a). Mid-term test (MCQ) single best response	30
	b). III Semester examination	80
	IV Semester	
	a). Mid-term (MCQ) single best response	30
	b). IV Semester examination	80
	V Semester	
	a). Prelims examination	80
	Total theory	300 (reduced to out of 15)

Practicals	III Semester examination	40
	IV Semester examination	40
	Prelims examination	40

	Total Practicals	120
		(reduced to out of 12)

Journal	Year ending	03
	Total internal assessment	30

From the batches joining in June 2001 and later

Examination Head	**Semester/term wise distribution**	**Total No of marks**
Theory	III Semester Term ending examination	50
	IV Semester Term ending examination	50
	V Semester a). Prelims examination	80
	Total theory	180 (reduced to out of 15)
Practicals	III Semester examination	40
	IV Semester examination	40
	Prelims examination	40
	Total Practicals	120 (reduced to out of 12)
Journal	Year ending	03
	Total internal assessment	30

Vth semester

Prelims examination on the basis of University pattern (Theory, practical and viva) : Minimum 4 weeks gap between Prelims and University examination.

For the terminal theory examination 28 MCQs (1/2 mark each), 10 SAQs (option of 10 of any 12; 2 marks each) and 2 LAQs (option of 2 of any 3; 8 marks each) will be administered. The total time will be 2 hours 30 mins. This will be followed by practicals (total time 1 ½ hours). To familiarize the students with the `viva‟ methodology, the marks for the practical may be kept 20 while 20 marks may be given for the viva on theory topics (total 40 marks).

Prelim pattern will be as per the University exam with 2 papers in theory, each of 2 hours duration.

2. MICROBIOLOGY

1. Goal

The goal of teaching Microbiology is to provide understanding of the natural history of infectious diseases in order to deal with the etiology, pathogenesis, pathogenicity, laboratory diagnosis, treatment, control and prevention of these infections and infectious diseases.

2. Educational objectives

(a) Knowledge

The student at the end of one and half years should be able to: -

i. *state the etiology, pathogenesis and methods of laboratory diagnosis and apply that knowledge in the diagnosis, treatment, prevention and control of communicable diseases caused by microorganisms.*
ii. understand commensal, opportunistic and pathogenic organisms of human body and describe host parasite relationship.
iii. know and describe the pathogenesis of diseases caused by microorganisms.
iv. state the sources and modes of transmission of pathogenic and opportunistic micro-organisms including knowledge of insect vectors & their role in transmission of infectious diseases.
v. choose appropriate laboratory investigations required for clinical diagnosis.

(b) Skills

i. plan and interpret laboratory investigations for diagnosis of infectious diseases and correlate the clinical manifestations with the etiological agent.
ii. identify common infectious agents with the help of laboratory procedure, acquire knowledge of antimicrobial agents, use of antimicrobial sensitivity tests to select suitable antimicrobial agents for treatment.
iii. perform simple laboratory tests, which help to arrive at rapid diagnosis.
iv. be conversant with proper methods of collection, storage & transport of clinical material for microbiological investigations.
v. understand the principles of immunology and its application in the diagnosis and prevention of infectious diseases including immunization schedule, acquire knowledge of the scope of immunotherapy and different vaccines available for the prevention of communicable diseases.
vi. understand methods of disinfection and sterilization and their application to control and prevent hospital and community acquired infections including universal biosafety precautions and waste disposal.
vii. recommend laboratory investigations regarding bacteriological examination of food, water, milk and air.
viii. the student should be well equipped with the knowledge of prevalent communicable diseases of national importance and of the newer emerging pathogens.

(c) Attitude

i. the student will be regular, sincere, punctual and courteous and regular in studies.
ii. the student will follow all the rules laid down by the department and participate in all activities.
iii. the student will understand the importance of, and practice asepsis, waste segregation and appropriate disposal.
iv. the student will understand the importance of, and practice the best methods to prevent the development of infection in self and patient. (E.g. hand washing, using aprons for hospitals in hospitals only, regularly washing the aprons, wearing gloves (as and when required / handling specimens etc.).
v. the student will understand the use of the different antimicrobial agents including antibiotics to use judiciously and prevent misuse, (prescribing attitude).
vi. the student will understand the significance of vaccinations and will receive appropriate vaccines (e.g. TT, Hepatitis B and any other as per needs).
vii. the student will wash his/her hands with soap after each practical class.
viii. the student will leave the area allotted for his practical neat and tidy.
ix. the student will discard the slides in the appropriate container provided for the same.
x. the student will report any injury sustained in class, immediately.
xi. the student will report any breakage occurring during class times immediately.
xii. the student may give suggestions to improve teacher student association.

3. Total duration of para-clinical teaching 3 semesters
Total 360 teaching days

Total number of teaching hours allotted for Microbiology (As per MCI guidelines 1997). **250 hrs**

4. Syllabus

a. Learning methods

Lectures, practicals

Distribution of teaching hours

A) Theory (lectures &	…..	71
(tutorials	…..	26
Total	…..	**97**
B) Practicals and Revision	…..	120
C) Assessments	…..	33
Total	…..	250

b. & c. Sequential organisation of contents and their division

The areas of study in Microbiology will include General Microbiology, Systemic Microbiology including Bacteriology, Immunology, Mycology, Virology, Rickettsia, Chlamydia, Parasitology and Applied microbiology in relation to infections and diseases of various systems of the body.

A) GENERAL MICROBIOLOGY: (n=10)

No	***Topic of lecture***	***Must know (MK)***	**Desirable to know (DK)**	***Hrs***
1.	Introduction and Historical background	Definitions: Medical Microbiology, pathogen, commensal, symbiont etc. To cover Anton van Leewenhoek, Pasteur, Lister, Koch, Flemming etc. In History: Scope to cover the importance of Med. Microbiology on diagnosis and prevention of infectious diseases.	Micro-organisms as models in Molecular Biology and Genetic engineering.	1
2.	Morphology of bacteria and Classification	Bacterial cell and its organelles, morphological classification, methods of studying bacteria, staining methods & their principles Grams & Zeil Nelson staining, their importance in presumptive diagnosis, negative staining, dark ground illumination, phase contrast and fluorescent microscopy, briefly about electron microscopy. Principles and applications of all microscopes.		1
3.	Physiology of bacteria including growth requirements & metabolism	Nutrition, respiration (anaerobic & aerobic) and growth of bacteria, growth curve, physical factors influencing growth. Culture media: Definition, classification and application.	Important constituents of culture media.	1
4.	Sterilization	Definition of sterilization, disinfection, asepsis, antiseptics. Ubiquity of bacteria, modes of killing microbes and preventing them, factors determining selection of the mode, factors adversely affecting sterilization. Enumeration of physical methods of sterilization including principle & their application.	Working and efficacy testing of autoclave, inspissator and hot air oven. Central Sterile Supply Department (CSSD) – concept only.	1
5.	Disinfectants	Asepsis and antisepsis, modes of Action of chemical agents on microbes. Phenols, Halogens, Aldehydes, Acids, Alcohol, heavy metals, oxidizing agents etc. Universal biosafety precautions.	Dyes, soaps and detergents. Concentration and contact time.	1
6.	Waste disposal	Definition of waste, classification, segregation, transport and disposal.		1

7.	Bacterial genetics and drug resistance to antimicrobial agents.	Introduction – codon, lac operon, mutation, transformation, transduction & conjugation, R factor, mode of action of antimicrobials on bacteria, mechanism of drug resistance and antimicrobial susceptibility tests, steps taken to minimize emergence of resistant strains (Antibiotic policy, formulation),		1
8.	Host parasite relationship and bacterial infections	Commensal, pathogenic and opportunistic organisms, their pathogenic factors and modes of transmission. Microbial factors: spores, capsule, toxins, enzymes, intracellular parasitism, antigenic variation & extrinsic factors etc. leading to establishment of infection. Types of infection: primary, secondary, general, local, natural, nosocomial, iatrogenic, zoonotic.		1
9.	Normal flora	Introduction – various sites, types and role		1
10.	Methods of identification of bacteria. Diagnosis of infectious diseases (direct and indirect)	Principles of laboratory diagnosis of infectious diseases. General procedures for collection transport, processing of specimens for microbiological diagnosis.	PCR, RIA, DNA probes.	1

B) IMMUNOLOGY: (n=12)

No.	Topic	Must know	Desirable to know	Hrs
1	Introduction	Definition of immunity, types of immunity, factors responsible, mechanism of innate immunity, active and passive immunity, local immunity.	Herd immunity	1
2	Antigens, HLA	Definition, types, antigen determinants, properties of antigen. MHC- concept, class- I, II & III functions, indication of typing, MHC restriction.	Nature of determinants, e.g. of haptens, e.g. of cross- reactive antigen.	1
3	Antibodies	Definition, nature, structure of immuno-Globulins, papain digestion, understand isotypic, allotypic and idiotypic markers, immunoglobulin classes, physical and biological properties of immunoglobins.,	Pepsin digestion, amino acid sequence, immunoglobin domain, abnormal immunoglobins.	1
4	Serological reactions	Definition, characteristics, titre, sensitivity & specificity, antigen- antibody interaction-primary, secondary & tertiary, prozone phenomenon, principle, types and application of precipitation, agglutination, complement fixation, enzyme immunoassay, radioimmunoassay, immunofluoroscence test, neutralization and opsonisation.	Techniques of precipitation and their uses, blocking antibodies, antiglobulin reactions, co-agglutination, in vitro test, techniques of EIA, IF & electron microscopy.	2

5	Immune response	Types, development, role of --thymus, bone marrow, lymph nodes & spleen, cells of lymphoreticular system, morphology and role of T subsets, NK cells, B cells , plasma cells and macrophages, B & T cell activation, antigen processing and presentation, primary and secondary immune response, principle and uses of monoclonal antibodies, factors affecting antibody production, CMI-definition, types, role of T cell and macrophages, definition of immune tolerance and mechanism of tolerance.	Lymphokines and their role, clonal selection, mechanism of immunoregulation, theories of antibodies formation, techniques of monoclonal antibody formation, detection of CMI, types of immunotolerance.	2
6	Complement	Definition, synthesis, pathways, activation, role & biological functions, components, measurement.	Regulation of complement activation, complement deficiency	1
7	Hypersensitivity	Definition, classification, , difference between immediate and delayed reaction, mechanism of anaphylaxis, manifestations of anaphylaxis, types of anaphylaxis, atopy, e.g. of anaphylactic reaction, tests for anaphylaxis, mechanism and e.g. of type-II & type-III reactions, mechanism & types of delayed hypersensitivity.	Desensitization in anaphylaxis, type V reaction, ADCC, Shwartzman phenomenon.	1
8	Autoimmunity	Definition, mechanism, classification, pathogenesis.		1
9	Transplantation & tumour immunology	Types of transplants, mechanism of transplant rejection, prevention of graft rejection, GVH reaction, IR to tumours, tumour antigens, mechanism of IR to tumours.	Type of tumour antigens, immune surveillance.	1
10.	Immuno-Deficiency	Classification, examples, laboratory tests for detection, manifestations.		1

C) SYSTEMIC BACTERIOLOGY: (n=21)

Pathogenesis includes:

- Infectious agent - MK
- Habitat - MK
- Source / reservoir - MK
- Mode - MK
- Infective dose - MK
- Multiplication, spread - MK
- Clinical features, pathology - MK
- Complications - MK
- Virulence factors - MK
- Immunological response - DK

**MK- Must know*
**DK- Desirable to know*

Laboratory diagnosis: -MK___

- Specimen selection -MK
- Collection -MK
- Transport -MK
- Primary smear, hanging drop -MK
- Selection of media -MK
- Pathogenicity testing -MK
- Anti microbial drug susceptibility testing-MK
- Serological interpretation -MK

Key to the abbreviations used in the table below:

✌ **A**- Classification, **B**- Morphology, **C**- Culture and isolation, **D**- Biochemical reactions,

E- Viability, **F** -Virulence, **G**- Diseases, **H**- Antigens, **I**- Pathogenesis, **J**- Laboratory diagnosis, **K**- Prevention and control, **L**- Immune response

No	**Topic/ hours**	**A**	**B**	**C**	**D**	**E**	**F**	**G**	**H**	**I**	**J**	**K**	**L**
1	Staphylococci (1 hour)	MK	MK	DK	DK	MK	MK	MK	DK	MK	MK	MK	-
2	Streptococci Pneumococci (1 hour)	MK	MK	BA-MK, DK	DK	MK	MK	MK	MK	MK	MK	MK	DK
3	Neisseria (1 hour)	DK	MK	DK	DK	MK	MK	MK	DK	MK	MK	MK	-
4	C.diptheriae (1 hour)	DK	MK	DK	-	MK	MK	MK	-	MK	MK	MK	DK
5	M.Tuberculosis (1 hour)	MK	MK	LJ,Growth Time MK	DK	MK	MK	MK	MK	MK	MK	MK	DK
6	Atypical mycobacteria (1hour)	MK	MK	DK	DK	MK	MK	MK	-	MK	MK	MK	-
7	M.leprae (1 hour)	MK	MK	Isolation-MK	-	MK	MK	MK	MK	MK	MK	MK	MK

8	Bacillus Methods of anaerobiosis & classification. Non sporing anaerobes (1 hour)	MK	MK	MK	DK	MK	MK	MK	-	MK	MK	MK	-
9	Clostridium welchii, tetani, botulinum (1 hour)	MK	DK	MK	-	-	-	MK	-	-	MK	-	-
10	Enterobacteriaceae (1 hour)	MK	MK	DK	DK	MK	MK	MK	DK	-	MK	-	-
11	Salmonella typhi (1 hour)	MK	MK	DK	DK	MK	MK	MK	DK	-	MK	-	MK
12	Shigella (1 hour)	MK	MK	DK	DK	MK	MK	MK	DK	-	MK	-	-
13	Vibrio & Campylobacter (1 hour)	MK	MK	DK	DK	MK	MK	MK	-	-	MK	-	-
14	Pseudomonas (1 hour)	-	MK	DK	DK	MK	MK	MK	-	-	MK	-	-
15	Other GNB (1 hour)	List only	MK	DK	-	-	MK	-	-	-	MK	-	-
16	Newer bacteria (1 hour)	List only	MK	DK	-	-	-	-	-	-	MK	-	-
17	Spirochete (1 hour)	MK	MK	DK	-	MK	-	MK	-	-	MK	-	DK
18	Actinomycosis & Nocardia (1 hour)	DK	MK	DK	-	-	-	-	-	-	MK	-	-
19	Rickettsia (1 hour)	MK	MK	-	-	-	-	-	-	-	MK	-	-
20	Chlamydia & Mycoplasma (1 hour)	MK	MK	-	-	-	-	-	-	-	MK	-	-
21	Bacteriology of air, water, milk and food (1 hour)	-	-	MK	DK	MK	MK	MK	-	MK	MK	MK	-

D) MYCOLOGY: (n=4)

No	Topic	Must know	Desirable to know	Hrs
1	Introduction to Mycology	Nature of fungus (definition, differences with bacteria), characteristics of fungi, common terminologies, brief account of types of sporulation and morphological classification of fungi. Methods of identification , Infections produced, Lab Diagnosis, processing of skin, hair and nail,	Growth requirements, ecological, medical and industrial importance of fungi (brief account).	1
2	Agents of Superficial mycosis	Enumerate, predisposing factors, morphological features, Lab. Diagnosis	Colony characteristics of dermatophytes	1
3	Subcutaneous mycosis	Enumerate, predisposing factors, Mycetoma, Rhinosporidiosis, Pathogenesis, Lab. Diagnosis	-	1
4	Systemic mycosis Opportunistic fungal infections	Classification, predisposing factors, Candida, Cryptococcus, Histoplasma morphology, pathogenesis, lab. Diagnosis Classification, predisposing factors, Mucor, Aspergillus, Pneumocystis carinii	Cultural characteristics	1

E) VIROLOGY: (n=12)

Morphology, pathogenesis, laboratory diagnosis, prevention and control for all viruses (Must know).

No	Topic of lecture	*Must know*	Desirable to know	Hrs
1	General Virology	Size, shape, symmetry, structure, resistance, multiplication, properties and classification of viruses, pathogenesis, bacteriophages, concept of virons	-	1
2	Laboratory diagnosis of viral infections	Collection of samples, transport, cultivation and methods of diagnosis	-	1
3	Viral immunity	Viral immunity, interferon, viral vaccines	-	1
4	Pox viruses	Small pox and Molluscum	-	1
5	DNA viruses	Papova, Adeno, Herpes viruses (Herpes simplex, Varicella zoster, CMV, EBV)	-	1
6	Respiratory viruses	Orthomyxo and Paramyxoviruses, Ag shift and drift	Rhinoviruses	1
7	Picornaviruses	Polio, Coxsackie, Enteroviruses, Viruses causing diarrhoea – Rota viruses, Immunity (polio)	-	1
8	Hepatitis viruses	Hepatitis viruses , immunity and laboratory diagnosis	-	1
9	Arboviruses	Dengue, KFD, Japanese encephalitis – definition, classification, enumeration in India, Pathogenesis, laboratory diagnosis and control	-	1

10	Rhabdoviruses	Rabies	-	1
11	Slow and Oncogenic viruses	Characteristics of slow virus infections, pathogenesis and laboratory diagnosis and viruses associated with it	-	1
12	Retroviruses	HIV/AIDS, Immunity, USP	-	1

F) PARASITOLOGY: (n=11)

Must know –

- Geographical distribution
- Habitat
- Morphology (different stages) found in human beings
- Life cycle
- Pathogenesis
- Laboratory diagnosis
- Treatment
- Control
- Immunoprophylaxis

No	Topic of lecture	Must know	Desirable to know	Hrs
1	Introduction to medical Parasitology	Parasites: their nature, classification, and explanation of terminologies, epidemiology, emerging parasitic infections, (pathogenicity and laboratory diagnosis)		1
2	E. histolytica	Amoebic infections		1
3	Free living amoebae and flagellates	Free living amoebae, PAME, Giardia & Trichomonas		1
4	Hemoflagellates	L. donovani: life cycle, morphology, pathogenicity, and lab. Diagnosis etc.	Brief account of Trypanosomes	1
5	Malaria	Malarial parasites: life cycle, morphology, pathogenicity, laboratory diagnosis etc.		1
6	Misc. Pathogenic protozoa	Toxoplasma,	Cryptosporidium, Isospora, B.coli	1
7	Cestodes	Taenia saginata & solium, Echinococcus granulosus, life cycle, morphology, pathogenicity and laboratory diagnosis.	Brief mention of other cestodes	1
8	Trematodes	Schistosomiasis: life cycle, morphology, pathogenicity & lab diagnosis.	Brief account of Fasciola hepatica	1
9	Intestinal Nematodes	A.duodenale, A. lumbricoides, E. vermicularis, T. tritura	brief mention of S. stercoralis, life cycle,morphology laboratory diagnosis	2
10	Tissue Nematodes	W. bancrofti, D. medinensis, in brief T. spiralis		1

TUTORIALS (APPLIED MICROBIOLOGY) : (n=26)

Regular tutorials, student seminars & symposia shall be conducted in addition to lectures.

Students must know:

- Micro-organisms causing diseases & pathological lesions
- Methods of collection & transportation of specimens
- Methods of laboratory diagnosis
- Serological response produced by organisms
- Interpretation of laboratory report

No	Topic of Tutorial	Hrs
1	Gastrointestinal infections (diarrhoea and dysentery) and their laboratory diagnosis	2
2	Upper respiratory tract infection (patch and sore throat) and their laboratory diagnosis	2
3	Lower respiratory tract infection (pneumonia, bronchitis, bronchiolitis etc.) and their laboratory diagnosis	2
4	Urinary tract infection and their laboratory diagnosis	2
5	Infections of the central nervous system (meningitis, encephalitis, brain abscess) and their laboratory diagnosis	2
6	Wound infections and pyogenic infections	2
7	Septicemia and laboratory diagnosis and PUO	2
8	Eye infections and their laboratory diagnosis	2
9	Sexually transmitted disease (STD) and their laboratory diagnosis (genital ulcerative disease)	2
10	Role of laboratory in cross infection, Nosocomial infections / outbreak / epidemic	2
11	Vehicles and vectors of communicable disease & zoonosis	2
12	Preventive inoculations, immunomodulation and immunotherapy	2

Suggested topics for integrated teaching:

- Tuberculosis and Leprosy
- Pyrexia of Unknown Origin (PUO)
- Sexually Transmitted Diseases
- Hepatitis
- HIV / AIDS
- Malaria
- Diarrhoea and Dysentery

Note: Each topic may be allotted 3 hours. These topics may be covered in 2nd and 3rd term of 2nd MBBS.

d. Term-wise distribution

First term (4 months)	Theory- 32 hours	Practical- 32 hours
Second term (5 ½ months)	Theory- 66 hours	Practical- 44 hours
Third term (4 months)	Theory- 48 hours	Practical- 32 hours
Total teaching hours	**254 hours**	

System-wise distribution

TERM	BROAD TOPICS	NO. OF CLASSES		TUTORIALS (2 hours)
		Lectures (1 hour)	Practicals (2 hours)	
First term	General Microbiology	10	28	-
	Systemic Bacteriology	18	24	-
Second term	Systemic bacteriology	3	19	-
	Immunology	12	4	-
	Virology	12	4	-
	Mycology	5	4	-
	Parasitology	11	24	-
Third term	Applied microbiology	-	-	26

e. Practicals : Total hours, number & contents : (n=100)

No	Topic	Hrs
1.	Introduction to Microbiology, Microscopy and Micrometry.	4
2.	Morphology and physiology of bacteria and methods staining.	4
3.	Growth requirements of bacteria (media) and identification of bacteria (biochemical reactions).	4
4.	Scheme for laboratory diagnosis of infectious diseases and collection, storage and transport of microbiological specimens and laboratory animals.	4
5.	Sterilization- the physical agents. Sterilization- the chemical agents and method of waste disposal.	4
6.	Serological tests for diagnosis of microbial infections.	4
7.	Staphylococci and other gram-positive cocci.	4
8.	Streptococci and Pneumococci.	4
9.	Gram negative cocci	4
10.	C. diphtheriae and other gram positive non sporing bacilli	4
11.	Mycobacteria	4
12.	Spore bearing aerobic and anaerobic bacilli.	4
13.	Enteric gram-negative bacilli – lactose fermenters - E.coli etc	4
14.	Non lactose fermenters – Salmonella and Shigella	4
15.	V. cholerae and other Vibrio like organisms	4
16.	Other gram-negative bacilli including Pseudomonas, Proteus and hospital acquired infection.	4
17.	Spirochetes	4
18.	Actinomycetes, Nocardia and Fungi.	4
19.	Rickettsia, Chlamydia, Mycoplasma and Viruses	4
20.	Introduction to Parasitology and Protozoal infections (including Isospora & Cryptosporidium)	4
21.	Haemoflagellates	4
22.	Plasmodia and toxoplasma.	4
23.	Cystodes and trematodes	4
24.	Intestinal nematodes	4
25.	Extra-intestinal nematodes.	4

The number of practicals and lectures can be changed as per the needs.

Introdu cti on Of " Bio -Me dical W aste" topi c in su bject of Microbiol o g y & P reventi ve
& Social Medicine

f. Books recommended:

1. Textbook of Microbiology - *R. Ananthanarayan C. K. Jayaram Panikar*
2. A Textbook of Microbiology - *P. Chakraborty*
3. Textbook of Medical Microbiology - *Rajesh Bhatia & Itchpujani*
4. Textbook of Medical Microbiology - *Arora and Arora*
5. Textbook of Medical Parasitology - *C. K. Jayaram Panikar*
6. Textbook of Medical Parasitology - *Arora and Arora*
7. Textbook of Medical Parasitology - *S.C.Parija*
8. Microbiology in clinical practice - *D. C. Shanson*

A Textbook of Parasitology - *Dr. R.P. Karyakarte and Dr. A.S. Damle*

Reference books:

1. Mackie McCartney practical Medical Microbiology- *Colle JG , Fraser AG*

2. Principles of Bacteriology, Virology & Immunology vol. 1,2,3,4,5- *Topley Wilsons*
3. Medical Mycology (Emmons)- *Kwon – Chung*
4. Review of Medical Microbiology (Lange)- *Jawetz*
5. Immunology- *Weir DM*
6. Medical Microbiology- *David Greenwood, Richard Stack, John Pentherer*

7. Parasitology- *KD Chatterjee*
8. Medical virology- *Timbury MC*
9. Mackie McCartney Medical, Microbiology vol.1- *Duguid JP*
10. Microbial infections- *Marmion BP, Swain RHA*

5. Evaluation

a. Methods

Theory, Practical & Viva

No		Total marks
1	Theory (2 papers – 40 marks each)	80
2	Oral (Viva)	15
3	Practical	25
4	Internal assessment (theory –15, practicals –15)	30
	TOTAL	**150**

Passing : A candidate must obtain 50% in aggregate with a minimum of 50% in Theory including oral and minimum of 50% in practicals and 50% in internal assessment (combined theory and practical).

b. Pattern of Theory Examination including Distribution of Marks, Questions, Time.

Nature of Question Paper

Faculty with Year : ***SECOND MBBS***

Subject : **MICROBIOLOGY**

Paper : ***I***

Total Marks : ***40*** ***Time*** : ***2 Hours***

Section "A" (8 Marks)

Instructions:-

1) Fill (dark) the appropriate empty circle below the question number once only..
2) Use **blue/black** ball point pen only.
3) Each question carries **one / half mark.**
4) **Students will not be allotted mark if he/she overwrites strikes or put white ink on the cross once marked.**
5) Do not write anything on the blank portion of the question paper. If written anything, such type of act will be considered as an attempt to resort to unfair means.

Section "A" : MCQ (8 marks)

Question No.	Question Description	Division of Marks	Total Marks
1.	Total MCQs : 16	16 X ½	08

Section "B" & "C" (32 Marks)

Instructions:-

1) All questions are compulsory.
2) The number to the right indicates full marks.
3) Draw diagrams wherever necessary.
4) **Answer each section in the respective answerbook only. Answers written in the inappropriate sectional answer books will not be assessed in any case.**
5) Do not write anything on the blank portion of the question paper. If written anything, such type of act will be considered as an attempt to resort to unfair means.

Section "B" : BAQ (20 Marks)

Question No.	Question Description	Division of Marks	Total Marks
2.	**Brief answer questions** **(Attempt any five out of six)** a) b) c) d) e) f)	5 X 4	20

Section "C" : LAQ (12 Marks)

Question No.	Question Description	Division of Marks	Total Marks
3.	**Attempt any two out of three:** ***Long answer question only*** a) b) c)	2 X 6	12

Faculty with Year : SECOND MBBS

Subject : MICROBIOLOGY

Paper : II

Total Marks : 40 ***Time : 2 Hours***

Section "A" (8 Marks)

Instructions:-

1) Fill (dark) the appropriate empty circle below the question number once only..
2) Use **blue/black** ball point pen only.
3) Each question carries **one / half mark.**
4) **Students will not be allotted mark if he/she overwrites strikes or put white ink on the cross once marked.**
5) Do not write anything on the blank portion of the question paper. If written anything, such type of act will be considered as an attempt to resort to unfair means.

Section "A" : MCQ (8 marks)

Question No.	Question Description	Division of Marks	Total Marks
1.	Total MCQs : 16	16 X ½	08

Section "B" & "C" (32 Marks)

Instructions:-

1) All questions are compulsory.
2) The number to the right indicates full marks.
3) Draw diagrams wherever necessary.
4) **Answer each section in the respective answerbook only. Answers written in the inappropriate sectional answer books will not be assessed in any case.**
5) Do not write anything on the blank portion of the question paper. If written anything, such type of act will be considered as an attempt to resort to unfair means.

Section "B" : BAQ (20 Marks)

Question No.	Question Description	Division of Marks	Total Marks
2.	**Brief answer questions** **(Attempt any five out of six)** a) b) c) d) e) f)	5 X 4	20

Section "C" : LAQ (12 Marks)

Question No.	Question Description	Division of Marks	Total Marks
3.	**Attempt any two out of three:** ***Long answer question only*** a) b) c)	2 X 6	12

A) MICROBIOLOGY PAPER I

- General Microbiology
- Systematic bacteriology including Rickettsia, Chlamydia and Mycoplasma
- Related applied microbiology.

B) MICROBIOLOGY PAPER II

- Parasitology
- Mycology
- Virology
- Immunology
- Related applied Microbiology.

d. Marking scheme

Each paper of 40 marks as shown in the above table.

e. Nature of practicals and duration

Practical examination in MICROBIOLOGY will be of 26 marks and oral (viva) of 14 marks of THREE hours duration.

Q.1:	Gram staining	5
Q.2:	Zeil – Nelson‟s staining	5
Q.3:	Stool examination for Ova/cyst	6
Q.4:	Spot identification (Ten spots)*	10
	Total-	**26**

(*Spots- Microscopic slides, Mounted specimen, Instruments used in laboratory, Serological tests, Inoculated culture medium, Sterile culture medium, Vaccines / serum).

f. Viva (Two tables)

		Marks
A:	General & Systemic Microbiology	7
B:	Mycology, Parasitology, Virology, Immunology	7

g. Plan for internal assessment

Marks for Internal Assessment:

Theory:	15
Practical:	15

From the batches which have joined before June 2001

Theory examination

Internal assessment for theory shall be calculated on the basis of two term ending examinations (I^{st} & II^{nd}), two mid term examinations in I^{st} & II^{nd} term & one preliminary examination at the end of the course (total 5 examinations) till the batch of Nov.2000 admission appears for University examination.

Marks Distribution for theory examination: (Internal assessment)

Examination	MCQ		SAQ		LAQ		Total	Time
	Marks	No.	Marks	No.	Marks	No.		
Ist & IInd midterm	10	20	20	10/12	-	-	30	1 hr
Ist & IInd term	28	56	24	12/14	28	4/5	80	3 hr

MCQ = Multiple choice questions, SAQ = Short answer questions, LAQ = Long answer questions

Preliminary examination (as per the University pattern – 2 papers, 3 h each) 80 marks
Internal assessment marks for theory will be computed to 15 out of total 300 marks.

Practicals (Internal assessment):
Three term ending practicals only.

Marks Distribution of Practicals:

Ist term ending examination	40
IInd term ending examination	40
Preliminary Practical examination	40
	Total- 120

Internal assessment marks for Practicals have to be computed out of 12 marks at the end of the curriculum and add marks for journals out of 3. Thus, total marks for practical assessment will be 15.

From the batches joining in June 2001 and later

Pattern for computation of ' Internal Assessment ' in the subject of Microbiology. (Applicable to the batch joining in June 2001)

THEORY:
Internal assessment shall be computed on the basis of three term ending examinations (two terminals & one preliminary examination before the university examination).

EXAMINATION	No.of Papers	Pattern	Duration of each paper	Total Marks
1ST TERMINAL	One -50 Marks	MCQs- 28(14 Marks) SAQs- 10/12 (20 Marks) LAQs- 2/3 (16 Marks)	2 Hours 30 Minutes	50
2ND TERMINAL	One - 50 marks	MCQs- 28(14 Marks) SAQs- 10/12(20Marks) LAQs- 2/3 (16 Marks)	2 Hours 30 Minutes	50

PRELIMINARY (As per final University pattern)	Two - 40 marks each	Each paper- MCQs- 28(14 Marks) SAQs- 6/7(12Marks) LAQs- 2/3 (14 Marks) (Total- 40 Marks, each paper)	2 Hours each paper	80
			TOTAL	180

Final internal assessment in THEORY shall be computed on the basis of actual marks obtained out of 180, reduced to marks out of 15.

PRACTICAL:

Internal assessment in PRACTICALS shall be computed on the basis of three term ending examinations and the marks allotted to practical record book.

EXAMINATION	PATTERN	MARKS	TOTAL
1ST TERMINAL	Exercise(eg.Gram's Stain)	10	40
	Spotting	10	
	Viva	20	
2ND	Exercise/Exercises(eg .Gram's & Z.N. Stain)	10	40
	Spotting	10	
	Viva	20	
PRILIMINARY EXAM As per University pattern	Gram's Stain	5	40
	Ziehl-Neelson Stain	5	
	Stool Exam.	5	
	Spotting	10	
	Viva	15	
		TOTAL	120

Actual marks obtained out of 120 shall be reduced to out of 12. Add marks obtained out of 3 for Practical Record Book. Total internal assessment marks for Practical shall be out of (12+3) 15.

Total Internal Assessment : Theory --- 15
Practical -- 15

Total: 30

Pharmacology and Pharmacotherapeutics

1. Goal

The broad goal of teaching pharmacology to undergraduate students is to inculcate in them a rational and scientific basis of therapeutics.

2. Educational objectives

(a) Knowledge

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

i. describe the pharmacokinetics and pharmacodynamics of essential and commonly used drugs
ii. list the indications, contraindications, interactions and adverse reactions of commonly used drugs
iii. indicate the use of appropriate drug in a particular disease with consideration of its cost, efficacy and safety for -
   - individual needs, and
   - mass therapy under national health programmes

iv describe the pharmacokinetic basis, clinical presentation, diagnosis and management of common poisonings
v Integrate the list the drugs of addiction and recommend the management
vi. Classify environmental and occupational pollutants and state the management issues
vii. Explain pharmacological basis of prescribing drugs in special medical situations such as pregnancy, lactation, infancy and old age
vii explain the concept of rational drug therapy in clinical pharmacology
viii state the principles underlying the concept of `Essential Drugs‟
ix evaluate the ethics and modalities involved in the development and introduction of new drugs

(b) Skills

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

i. prescribe drugs for common ailments
ii. identify adverse reactions and interactions of commonly used drugs
iii. interpret the data of experiments designed for the study of effects of drugs and bioassays which are observed during the study
iv. scan information on common pharmaceutical preparations and critically evaluate drug formulations
v. be well-conversant with the principles of pharmacy and dispense the medications giving proper instructions

(c) Integration

Practical knowledge of rational use of drugs in clinical practice will be acquired through integrated teaching vertically with pre-clinical & clinical subjects and horizontally with other para-clinical subjects.

3. Total duration of para-clinical teaching 3 Semesters (III,IV,V)

Total 360 teaching days

Total number of teaching hours allotted to Pharmacology 300 hours

4. Syllabus

a. Learning methods

Lectures, tutorials, Practicals

Distribution of teaching hours

Theory

- ***lectures*** ***……...109 ± 5***
- ***tutorials*** ***…….17 ± 5***

Total 126 ± 10

B) Practicals ……...120 ± 5

C) Revision & Evaluation (Internal Assessment) ……..60

b. & c. Sequential organisation of contents & their division

A) INTRODUCTION: ***Pharmacology - a foundation to clinical practice***
(N=1)
Development of the branch of pharmacology; Scope of the subject; role of drugs as one of the modalities to treat diseases,
definition of drug;
nature and sources of drugs;
subdivisions of pharmacology
rational pharmacotherapy

B) GENERAL PHARMACOLOGY: (N=7 ± 2)

Pharmacokinetics: Absorption, Distribution, Biotransformation, Elimination
(n=3) Pharmacodynamics: Principles of Drug Action, Mechanisms of drug action,

Receptors (Nature, Types, Theories, Principles, Regulation) (n=1)

Application to pharmacotherapeutics: Relevance of Pharmacokinetics and dynamics

in clinical practice, Sequale of repeated administration of drug (n=2)

Adverse Drug Reactions (n=1)

Adrenergic agonists (n=1)

Adrenergic antagonists I: □-blockers (n=1)

Adrenergic antagonists II: □-blockers (n=1)

Cholinergic agonists (n=1)

Anticholinesterases (n=1)

Antimuscarinic drugs (n=1)

Skeletal muscle relaxants (n=1)

A) CARDIOVASCULAR SYSEM INCLUDING DRUGS AFFECTING COAGULATION AND THOSE ACTING ON KIDNEYS: (N=14 ± 2)

General Considerations and Overview of antihypertensive therapy;
Diuretics (n=2)
Angiotensin Converting Enzyme (ACE) inhibitors (n=1)
Sympatholytics & vasodilators (n=1)

Management of hypertension

Antianginal: Nitrates & others (n=1)
Calcium channel blockers (n=1)

Pharmacotherapy of chest pain

Anticoagulants & Coagulants
Thrombolytics & Antiplatelet Agents (n=2)

Drugs for CCF: Digitalis glycosides, Others agents (n=2)

Management of CCF

Antiarrhythmic Agents (n=1)

Agents used for the management of shock (n=1)

Hypolipidaemic drugs (n=1)

Role of Nitric oxide and endothelin to be covered in CVS
…….DK

E) AUTONOMIC PHARMACOLOGY. (N=9 ± 2)

General Considerations (n=1)
Agents used in therapy of iron deficiency anaemia and megaloblastic anaemia; (n=1)
Erythropoietin,
GM-CSF (n=1)

Management of anaemia

F) NEUROPSYCHIATRIC PHARMACOLOGY INCLUDING INFLAMMATON, PAIN & SUBSTANCE ABUSE (N=15 ± 2)

General Considerations (n=1)
Sedative-Hypnotics (n=2)
Psychopharmacology: Antianxiety; Antipsychotics; Antidepressants (n=3)
Antiepileptics (n=2)

Therapy of neurodegenerative disorders:
Anti-Parkinsonian agents; cerebral vasodilators/nootropics (n=1)
Local anaesthetics (n=1)

Analgesics: Opioids; NSAIDs (n=3)

Pharmacotherapy of pain including migraine
Pharmacotherapy of rheumatoid arthritis and gout

Substance abuse: Management of opioid, alcohol and tobacco addictions (n=1)

G) MISCELLANEOUS TOPICS - I: (N=6 ± 2)

Autocoids *(to be covered before pain lectures)* (n=1)
Antiallergics: Antihistaminics (n=1)

Drugs used for bronchial asthma (n=1)

Pharmacotherapy of cough

Drugs acting on immune system:

Immunostimulants, immunosuppressants; pharmacology of vaccines & sera (n=1)

Drugs acting on the uterus (n=1)

Antimicrobial agents: (n=7)

- Sulphonamides & Cotrimoxazole
- Quinoline derivatives
- Penicillins, Cephalosporins & Other □ Lactams
- Aminoglycosides
- Macrolides
- Tetracyclines & Chloramphenicol

Pharmacotherapy of UTI

General principles of Antimicrobial use (n=1)
Antimycobacterial therapy: Anti-Kochs agents; Anti-leprotic agents (n=3)

Pharmacotherapy of tuberculosis

Antiprotozoal agents:

Antiamoebic, Antimalarials and Anti Kala azar (n=3)

Pharmacotherapy of malaria

Antihelminthics (n=1)

(against intestinal Nematodes and Cestodes; extra intestinal Nematodes and Trematodes)

Antifungal agents (n=1)

Antiviral agents including antiretroviral agents (n=2)

Pharmacotherapy of STDs (n=1)

Principles of cancer chemotherapy and their adverse drug reactions (n=1)
(individual agents and regimes need not be taught)

I) ENDOCRINOLOGY: (N=12 ± 2)

Introduction to endocrinology

(including Hypothalamic and Anterior Pituitary hormones) (n=1)
Steroids (n=2)
Glucocorticoids: Use and Misuse
Oestrogens & antagonists (n=1)
Progestins & antagonists (n=1)
Oral contraceptives & profertility agents (n=1)

I) CHEMOTHERAPY INCLUDING CANCER CHEMOTHERAPY: (N=22 ± 2)

Hormones & related synthetic agents (n=2)
Fertility control
General considerations (n=1)
Thyroxine and antithyroid agents (n=2)
Agents affecting calcification (n=1)
Antidiabetic agents: Insulin; Oral antidiabetic drugs (n=2)

Pharmacotherapy of Diabetes Mellitus

J) AGENTS USED IN GASTROINTESTINAL DISORDERS: (N=2)

Pharmacotherapy of nausea & vomiting (n=1)
Pharmacotherapy of peptic ulcer (n=1)

Management of dyspepsia
Management of diarrhoea and constipation

K) PERIOPERATIVE MANAGEMENT: *to be covered as a **case study***
Preanaesthetic medication
Preparation of surgical site: antiseptics etc.
Local Anaesthetics
Skeletal muscle relaxants
Drugs used in post-operative period: analgesics, antiemetics etc.

L) MISCELLANEOUS TOPICS – II (N=5-7)

Drug-Drug Interactions (n=1)
Drug use at extremes of age, in pregnancy & in organ dysfunction (n=2)
Use of chelating agents in heavy metal poisonings; Environmental & occupational toxicants and principles of management (particularly cyanide and CO) (n=1)
Ocular pharmacology (n=1)
Dermatopharmacology (n=1)

Gen e ral An aesthetics…
DK

Pharmacotherapy of glaucoma and conjunctivitis

M) RATIONAL PHARMACOTHERAPY: (N=4)

Prescription writing and P-drug concept
Rational Drug Use; Essential Drug List (EDL)

Criticism with reference to Fixed Drug Combinations (FDCs)

Use and misuse of commonly used preparations: vitamins, antioxidants, enzymes etc.

d. Term-wise distribution

I term

Introduction
General pharmacology
Autonomic pharmacology
Drugs acting on cardiovascular system including drugs affecting coagulation and those acting on the kidneys

II term

Prescription writing and P-drug concept
Rational use of drugs; Essential drug list
Neuro-psychiatric pharmacology including inflammation, pain and substance abuse
Miscellaneous topics - I
Chemotherapy
Endocrinology

III term

Agents used in gastro-intestinal disorders

Peri operative management

Miscellaneous topics

Criticism with reference to FDCs

Use and misuse of commonly used preparations: vitamins, antioxidants, enzymes etc.

e. Practicals: Total hours, number & contents

Total hours: 120

Number: 18

Contents:

I term practicals **(N=7)**

Introduction to Practical Pharmacology, Prescription Writing, Pharmacokinetics I, Routes of Administration: Oral, Routes of Administration: Topical, Routes of Administration: Parenteral, Pharmacokinetics II: Applied Pharmacokinetics

II term practicals **(N=7)**

Pharmacodynamics I (Isolated Tissue, Cat NM junction), Pharmacodynamics II (Dog: BP and Respiration), Screening Techniques for New Drugs, Adverse Drug Reactions, Rational Pharmacotherapy I, Rational Pharmacotherapy II, Sources of Drug Information including scrutiny of Promotional Literature

III term practicals **(N=4)**

Case Study 1, Case Study 2
Revision Practicals (n=2)

***f. Books recommended* :**

1. Basic & Clinical Pharmacology. Katzung BG (Ed), Publisher: Prentice Hall International Ltd., London.
2. Pharmacology & Pharmacotherapeutics. Satoskar RS, Bhandarkar SD (Ed), Publisher: Popular Prakashan, Bombay.
3. Essentials of Medical Pharmacology. Tripathi KD (Ed), Jaypee Brothers, publisher:Medical Publishers (P) Ltd.
4. Clinical Pharmacology. Laurence DR, Bennet PN, Brown MJ (Ed). Publisher: Churchill Livingstone

***Reference books* :**

2. Goodman & Gilman‟s The Pharmacological Basis of Therapeutics. Hardman JG & Limbird LE (Ed), Publisher: McGraw-Hill, New York.
3. A Textbook of Clinical Pharmacology. Roger HJ, Spector RG, Trounce JR (Ed), Publisher: Hodder and Stoughton Publishers.

5. Evaluation

♍ ***Methods***

Theory, Practical & viva

b. Pattern of Theory Examination including Distribution of Marks, Questions & Time

Nature of Question Paper

Faculty with Year **:** ***SECOND MBBS***

Subject **:** **PHARMACOLOGY & THERAPEUTICS**

Paper **:** ***I***

Total Marks **:** ***40*** ***Time*** **:** ***2 Hours***

Section "A" (8 Marks)

Instructions:-

1) Fill (dark) the appropriate empty circle below the question number once only..
2) Use **blue/black** ball point pen only.
3) Each question carries **one / half mark.**
4) **Students will not be allotted mark if he/she overwrites strikes or put white ink on the cross once marked.**
5) Do not write anything on the blank portion of the question paper. If written anything, such type of act will be considered as an attempt to resort to unfair means.

Section "A" : MCQ (8 marks)

Question No.	Question Description	Division of Marks	Total Marks
1.	Total MCQs : 16	16 X ½	08

Section "B" & "C" (32 Marks)

Instructions:-

1) All questions are compulsory.
2) The number to the right indicates full marks.
3) Draw diagrams wherever necessary.
4) **Answer each section in the respective answerbook only. Answers written in the inappropriate sectional answer books will not be assessed in any case.**
5) Do not write anything on the blank portion of the question paper. If written anything, such type of act will be considered as an attempt to resort to unfair means.

Section "B" : BAQ (20 Marks)

Question No.	Question Description	Division of Marks	Total Marks
2.	**Brief answer questions** **(Attempt any five out of six)** a) b) c) d) e) f)	5 X 4	20

Section "C" : LAQ (12 Marks)

Question No.	Question Description	Division of Marks	Total Marks
3.	**Attempt any two out of three:** ***Long answer question only*** a) b) c)	2 X 6	12

Faculty with Year : SECOND MBBS

Subject : PHARMACOLOGY & THERAPEUTICS

Paper : II

Total Marks : 40 Time : 2 Hours

Section "A" (8 Marks)

Instructions:-

1) Fill (dark) the appropriate empty circle below the question number once only..
2) Use **blue/black** ball point pen only.
3) Each question carries **one / half mark.**
4) **Students will not be allotted mark if he/she overwrites strikes or put white ink on the cross once marked.**
5) Do not write anything on the blank portion of the question paper. If written anything, such type of act will be considered as an attempt to resort to unfair means.

Section "A" : MCQ (8 marks)

Question No.	Question Description	Division of Marks	Total Marks
1.	Total MCQs : 16	16 X ½	08

Section "B" & "C" (32 Marks)

Instructions:-

1) All questions are compulsory.
2) The number to the right indicates full marks.
3) Draw diagrams wherever necessary.
4) **Answer each section in the respective answerbook only. Answers written in the inappropriate sectional answer books will not be assessed in any case.**
5) Do not write anything on the blank portion of the question paper. If written anything, such type of act will be considered as an attempt to resort to unfair means.

Section "B" : BAQ (20 Marks)

Question No.	Question Description	Division of Marks	Total Marks
2.	**Brief answer questions** **(Attempt any five out of six)** a) b) c) d) e) f)	5 X 4	20

Section "C" : LAQ (12 Marks)

Question No.	Question Description	Division of Marks	Total Marks
3.	**Attempt any two out of three:** ***Long answer question only*** a) b) c)	2 X 6	12

c. Topic distribution

A) **PHARMACOLOGY PAPER I** includes General Pharmacology including drug-drug interactions; Autonomic Nervous System, Cardiovascular System including drugs affecting Coagulation and those acting on the Kidneys; Haematinics; Agents used in Gastro-Intestinal Disorders; Ocular pharmacology; Drug use at extremes of age, in pregnancy & in organ dysfunction; Diagnostic & Chelating agents; Environmental & Occupational Pollutants; Vitamins

B) **PHARMACOLOGY PAPER II** includes Neuro-Psychiatric Pharmacology including Antiinflammatory-Analgesics and Addiction & its management; Pharmacology in Surgery (particularly peri-operative management); Chemotherapy including Cancer Chemotherapy; Endocrinology; Dermatology; Miscellaneous Topics I (Lipid-derived autacoids; Nitric Oxide; Allergy - Histaminics & Antihistaminics including anti-vertigo; Anti Asthmatics; Anti-tussive agents; Immunomodulators; Vaccines & sera; Drugs acting on the uterus)

d. Marking scheme

Each paper of 40 marks as shown in the above table.

e. Nature of practicals and duration

Practical Heads	**Marks 26**
Prescription writing	**5**
• Long	(3)
• Short	(2)
Criticism	**8**
• Prescription & rewriting	(4)
• Fixed dose formulation	(4)

Clinical Pharmacy

(dosage forms, routes of administration, label information and instructions)

i. Spots **8**

a Experimental Pharmacology – Graphs, Models for evaluation, Identification of a drug, Interpretation of data (2)

b Human Pharmacodynamics - Drug Identification – urine analysis, eye chart, - Subjective / objective effects of a drug (2)

c Therapeutic problems based on pharmaceutical factors - Outdated tablet, Bioavailability, Dosage form, Ethics and Sources of drug information (2)

d Recognition of ADRs & interaction of commonly used drugs (2)

For each of the 4 groups (a, b, c & d) 2 spot questions each of 1mark to be asked.

Time distribution:
For prescription and criticism the time given will be ½ hour.
For clinical pharmacy practical viva will be taken on pre-formed preparations and/or marketed formulations. The students may be asked to write labels and instructions to be given to the patients or demonstrate how specific dosage forms are administered and state the precautions to be taken/ explained to the patients while using them. The time for this will be 5 min.
For spots 20 min will be given (2 min per spot).
Thus the total time for the practical examination will be 1 hour.

f. Viva: duration and topic distribution

Viva	14 marks
Duration	10 mins
Four examiners	5 mins with each candidate
Two examiners	for topics of paper I - systems to be distributed
Two examiners	for topics of paper II - systems to be distributed

At each table marks will be given out of 7.

g. Plan for internal assessment
The time-table for internal assessment will be as follows:

For the batches which have joined before June 2001

I term
1st midterm: After 60 teaching days (MCQs, and SAQs)
1st term ending: After 120 teaching days (Theory and Pharmacy Practicals)

II term
2nd midterm: After 60 days of 2nd term (MCQs and SAQs)
2nd term ending: At the end of 2nd term (Theory and Practicals: Exptal/Clinical Pharmacy)

IIIrd term
Prelims examination on the basis of University pattern -Theory, Practicals and Viva
(Minimum 4 weeks gap mandatory between Preliminary and University examinations)

For each mid-term examination 40 MCQs (each worth 1/2 mark) will be administered to the students along with 5 SAQs (each of 2 marks with an option of 5 out of 6). The total time will be 1 hour and the total marks will be 30.

The term ending examination will be of 80 marks and the nature of questions will be as per University exam.
This will be followed by practical (total time 1½ hours).
To familiarize the students with the „viva-vocé", the marks for the practical may be kept at only 20, while 20 marks be reserved for viva on theory topics (total 40 marks).

For the batches joining in June 2001 and later

I term
1st term ending: After 120 teaching days (Theory and Pharmacy Practicals)

II term
2nd term ending: At the end of the 2nd term (Theory and Practicals: Exptal/Clinical Pharmacy)

IIIrd term
Prelims examination on the basis of University pattern -Theory, Practicals and Viva
(Minimum 4 weeks gap mandatory between Preliminary and University examinations)

For the terminal theory examination students will be evaluated by a combination of 28 MCQs (each worth 1/2 mark), 10 SAQs (each of 2 marks with an option of 10 out of 12) and 2 LAQs (option of 2 out of 3 each worth 8 marks). The total time allotted for this 50 marks paper will be 2hours 30minutes.

This will be followed by practicals (total time 1½ hours).
To familiarize the students with the „viva-vocé", the marks for the practical may be kept at only 20, while 20 marks be reserved for viva on theory topics (total 40 marks).

Prelim pattern will be as per the University exam with 2 papers in theory, each of 2 hours duration.

FORENSIC MEDICINE AND MEDICAL JURISPRUDENCE INCLUDING TOXICOLOGY

1. Goal

The broad goal of teaching undergraduate students Forensic Medicine is to produce a physician who is well informed about Medico-legal responsibility during his/her practice of Medicine. He/She will also be capable of making observations and inferring conclusions by logical deductions to set enquiries on the right track in criminal matters and associated medico-legal problems. He/She acquires knowledge of law in relation to Medical practice, Medical negligence and respect for codes of Medical ethics.

2. Educational objectives

(a) Knowledge

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

i. identify the basic Medico-legal aspects of hospital and general practice
ii. define the Medico-legal responsibilities of a general physician while rendering community service either in a rural primary health centre or an urban health centre
iii. appreciate the physician‟s responsibilities in criminal matters and respect for the codes of Medical ethics
iv. diagnose, manage and identify also legal aspect of common acute and chronic poisonings
v. describe the Medico-legal aspects and findings of post-mortem examination in cases of death due to common unnatural conditions and poisonings
vi. detect occupational and environmental poisoning, prevention and epidemiology of common poisoning and their legal aspects particularly pertaining to Workmen‟s Compensation Act
vii. describe the general principles of analytical toxicology

(b) Skills

A comprehensive list of skills and attitude recommended by Medical Council of India Regulation, 1997 desirable for Bachelor of Medicine and Bachelor of Surgery (MBBS) Graduate for Forensic Medicine and

Toxicology

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

i. make observations and logical inferences in order to initiate enquiries in criminal matters and Medico-legal problems

a. to be able to carry on proper Medico-legal examination and documentation/Reporting of Injury and Age

b. to be able to conduct examination for sexual offences and intoxication

c. to be able to preserve relevant ancillary materials for medico - legal examination

d. to be able to identify important post-mortem findings in common unnatural deaths

ii. diagnose and treat common emergencies in poisoning and chronic toxicity
iii. make observations and interpret findings at post-mortem examination
iv. observe the principles of medical ethics in the practice of his profession

(c) Integration

Department shall provide an integrated approach towards allied disciplines like Pathology, Radiology, Forensic Sciences, Hospital Administration etc. to impart training regarding Medico-legal responsibilities of physicians at all levels of health care. Integration with relevant disciplines will provide scientific basis of clinical toxicology e.g. Medicine, Pharmacology etc.

3. Total duration of Para-clinical teaching 3 Semesters
Total 360 teaching days

Total number of teaching hours allotted for Forensic Medicine & Toxicology 100 hours

4. Syllabus

a. Learning methods
Lectures, tutorials, practical demonstrations

Distribution of teaching hours

Didactic lectures should not exceed one third of the time schedule, two third schedule should **include Practicals, Demonstrations, Group discussions, Seminars and Tutorials.**

Learning process should include living experiences and other case studies to initiate enquiries in criminal matters and Medico-legal problems.

A) Theory (lectures &		….. 40
Tutorials, seminar & allied)		….. 20
	Total	….. 60

B) Practicals (including demonstrations)		….. 25
		….. 15
	Total	….. 40

This period of training is minimum suggested. Adjustments whenever required, depending on availability of time, be made.

b. & c. Sequential organisation of contents & their division

Topic wise distribution

The course is designed to meet the needs of a General Practitioner and includes the following topics:

1.	Forensic Medicine	40 Hrs
2.	Toxicology	20 Hrs
3.	Medical Jurisprudence	12 Hrs
4.	Legal Procedures in Medico-Legal cases	08 Hrs
5.	Court attendance when medical evidence is being recorded	04 Hrs
6.	Integrated approach towards allied disciplines	06 Hrs
7.	Tutorial and Seminars	10 Hrs

Total: 100 Hrs

<u>Part – 1 Forensic Medicine</u>: (N=40)

Contents & division
Note: Must Know (MK), **Desirable to Know (DK) and `*" is Nice to Know (NK)**

A) DEFINITION, SCOPE RELEVANT TO SUBJECT

1. History of Forensic Medicine
2. **Need, Scope, Importance and probative value of Medical evidence in Crime Investigation**

B) PERSONAL IDENTITY NEED AND ITS IMPORTANCE.

1. **Data useful for Identification of Living and Dead**
2. **Age estimation and its medico-legal Importance**
3. Sex determination and it"s medico-legal importance
4. Other methods of establishing identity: Corpus Delicti, **Dactylography, Tattoo marks**, Deformities, Scars and other relevant factors
5. Identification of decomposed, Mutilated bodies and skeletal remains
6. Medico legal aspect of *DNA fingerprinting - a brief introduction
7. **Medico - legal aspect of blood and blood stains**

Collection, Preservation and Dispatch of Specimen for Blood and other ancillary material for identification and Medico-legal examination

C) **MECHANICAL INJURIES AND BURNS**

1. **Definition and classification of injuries: Abrasions, Contusions, Lacerations, Incised and Stab injury, Firearm and Explosion injury, Fabricated and Defence injury**
2. **Medico-legal aspect of injury/hurt, simple and grievous hurts, murder, Ante - mortem, Postmortem Wounds, Age of the injury, cause of death and relevant sections of I.P.C., Cr.P.C.**
3. **Causative Weapon and appearance of Suicidal, Accidental and Homicidal injuries**
4. Physical methods of Torture and their identification
5. **Reporting on Medico-legal cases of Hurts**
6. **Regional injuries**: Head injury, cut throat injuries and Road traffic accident injuries
7. **Thermal injuries**: Injuries due to heat and cold, Frostbite, Burns, Scalds and Bride burning
8. Injuries due to Electricity, Lightening

Collection, Preservation and Dispatch of Specimen for Blood and other ancillary material for Medico-legal examination

D) MEDICO-LEGAL ASPECTS OF SEX, MARRIAGE AND INFANT DEATH

1. **Sexual Offences and perversions**: Natural (**Rape**, Adultery, and Incest), Unnatural (**Sodomy, Bestiality** and Buccal coitus) Lesbianism, perversions and **relevant sections of I.P.C. and Cr.P.C.**
2. Fertility, **Impotence**, Sterility, **Virginity**, and Nullity of marriage and divorce on Medical ground
3. **Pregnancy, Delivery**, Paternity, Legitimacy, Artificial Insemination, *Fertilisation in Vitro, *Sterilization (Family Planning Measures)
4. **Abortions, Medical Termination of pregnancy, criminal abortions**, Battered Baby Syndrome, Cot deaths and relevant sections of I.P.C. and Cr.P.C., **M.T.P. Act of 1971 and foetal sex determination Act**
5. **Infant death (Infanticide)**
   i. Definition Causes, Manners and Autopsy features
   ii. Determination of age of Foetus and Infant
   iii. Signs of live-born, stillborn and dead born child

Collection, Preservation and Dispatch of Specimen: Hair, seminal fluid/ stains and other ancillary material for medico-legal examination, examination of seminal stains and vaginal swabs

E) MEDICO-LEGAL ASPECTS OF DEATH

1. **Definition and concept of death, stages, modes, Signs of death and its importance**
2. **Changes after death**, Cooling, Hypostasis, Changes in eye, Muscle changes, Putrefaction, Saponification, Mummification, **Estimation of time since death**
3. **Death Certification**, Proximate causes of death, causes of sudden deaths, Natural deaths. Presumption of death and survivorship, disposal and preservation of dead
4. Introduction to *The Anatomy Act, *The Human organ transplantation Act. 1994
5. Medico-legal aspects and findings of post-mortem examination in cases of **death due to common unnatural conditions**
6. **Sudden unexpected death**, deaths from starvation, cold and heat and their medico-legal importance
7. **Medico-legal aspects of death from Asphyxia, Hanging, Strangulation,** Suffocation and **Drowning**

F) MEDICO-LEGAL AUTOPSY

1. **Autopsy: Objectives, Facilities, Rules and Basic techniques, Proforma for reporting medico-legal autopsy**
2. **Exhumation**, examination of mutilated remains, Obscure autopsy and **post-mortem artifacts**

Collection, preservation and despatch of material for various investigations to Forensic Science Laboratory

G) *FORENSIC PSYCHIATRY

1. **Definition, General terminology** and * Basic concept of normality and abnormality of human behaviour, Civil and Criminal responsibility
2. Examination, Certification, restraint and admission to Mental Hospital
3. Mental Health Act – Principles and Objectives

Part – 2 Toxicology: (N=20)

A) POISONS AND THEIR MEDICO-LEGAL ASPECTS

1. **Definition of poison, General consideration and Laws in relation to poisons**\Narcotic drugs and psychotropic substances Act, *Schedules H and L drugs, *Pharmacy Act, **Duties and responsibilities of attending physician**
2. **Common poisons and their classification, Identification of common poisons**, Routes of administration, Actions of poisons and factors modifying them, **Diagnosis of poisoning (Clinical and Confirmatory) , Treatment/ Management of cases of acute and chronic poisonings**
3. Addiction and Habit forming drugs, drug dependence

4. **Occupational and environmental poisoning, prevention and Epidemiology of common poisoning and their legal aspects particularly pertaining to Workmen"s Compensation Act**
5. **Medico-Legal aspects and findings of postmortem examination in cases of death due to poisonings**

B) POISONS TO BE STUDIED

1. **Corrosive: Euphoric Acid**, Nitric Acid, Hydrochloric Acid, **Carbolic Acid** and Oxalic Acid, **Sodium and Potassium and Ammonium Hydro-Oxide**
2. **Non-metallic, Metallic Poisons and Industrial hazards: Phosphorus** and compounds of Lead, Arsenic, Mercury, **Copper**, and Glass powder
3. **Plant Poisons: Castor, Croton**, Capsicum, Semicarpus Anacardium (Bhilawa), Calatropis Gigantea, **Abrus Precatorius (Ratti), Dhatura, Cannabis Indica, Cocaine, Opium**, Aconite, Yellow Oleander, **Strychnine**
4. **Animal and Bacterial Poisons: Snakes**, Scorpion and Food poisoning
5. **Alcohol (Drunkenness) Ethyl Alcohol, Methyl Alcohol**, Kerosene, Barbiturates
6. **Asphyxiant & Gaseous Poisons: Carbon Monoxide**, War gases, Hydrocyanic acid, and Cyanides
7. **Insecticides, pesticides and Miscellaneous poisons: Organo-Phosphorus Compounds, Organo-Chloro Compounds, Carbamates (Carbaryl) and Rodenticides (Phosphides)**

Collection, Preservation and forwarding of evidence, remains of poison, body discharges and viscera etc. to Forensic Science Laboratory in cases of poisoning

C) FORENSIC SCIENCE LABORATORY: (BRIEF)

1. **Aims, objects, general knowledge about Forensic Science Laboratory**
2. **General principles of analytical toxicology**

<u>Part – 3 Medical Jurisprudence</u>: (N=12)

A) LEGAL AND ETHICAL ASPECTS OF PRACTICE OF MEDICINE

1. The **Indian Medical Council**, the Act, Formation and Functions;
   State Medical Council: Formation, Functions, and Registration
2. **Rights and obligations of Registered Medical Practitioners and patient, Duties of physicians and patients**, Euthanasia
3. **Infamous conduct, Professional secrecy and privileged communications**
4. **Codes of Medical Ethics, medical etiquette, Medical Negligence** and contributory negligence, **Precautionary measures and defences for Medical Practitioners against legal actions, Medical/Doctors indemnity insurance, Consumer Protection Act relevant to medical practice**
5. Medical Ethics and prohibition of Torture & care of Torture Victims

B) DEFINITION OF HEALTH AND ITEMS TO CERTIFY ABOUT HEALTH

1. **Common medico-legal problems in Hospital practice, Consent in Medical Examination and treatment, under treatment/ Sickness and Fitness certificate, maintenance of medical records**
2. Social, Medical, Legal and Ethical problems in relation to AIDS

C) ACTS AND SCHEMES RELATED TO MEDICAL PROFESSION IN BRIEF:

Workmen"s compensation Act, * Mental Health Act, **Medical Practitioner Act,** Protection of human rights Act, 1993, * National Human Rights Commission, * Human Organ Transplantation Act and other relevant sections of I.P.C., Cr.P.C. and I.E. Act. Maharashtra civil medical code, Hospital administration manual

Part – 4 Legal procedures in medico-legal cases: (N=8)

A. **Medico-Legal Investigations of death** in suspicious circumstances, different **Inquest**, type of offences
B. **Types of Criminal courts and their powers**, punishments prescribed by law, **kinds of witnesses, Evidence, Documentary Medical evidence**, Dying declaration and Dying deposition
C. The Trial of criminal cases, **Rules and Conventions to be followed by Medical Witness at Medical evidence**, **subpoena, conduct money**
D. Relevant Sections from the Indian Evidence Act, Indian Penal code and Criminal Procedure code

NOTE : Must know, desirable to know and „ * „ is nice to know

d. Term-wise distribution

Terms	Lectures	Non – Lectures	Pracs.	Demos. Tuts/Sem/Allied
I Term	15	08	06	06
II Term	15	10	05	06
III Term	10	07	04	08
Total	40	25	15	20

This period of training is the minimum suggested. Adjustments whenever required, depending on availability of time, be made

e. Practicals (including demonstrations) : Total no.of hours & contents

Practicals will be conducted in the laboratories.
Objective will be to assess proficiency in skills, conduct of experiment, interpretation of data and logical conclusion.
Emphasis should be on candidate‟s capacity in making observations and logical inferences in order to initiate enquiries in criminal matters and medico-legal problems.

Total Marks: 25 + 15 = 40

Contents:

Part 1 Forensic Medicine

Report on:

1. **Estimation/Certification of Age**
2. **Recording of fingerprints**
3. **Examination/Certification of the Injured [Prescribed Forms]**
4. **Examination of the Causative Agents in cases of Injuries (e.g. Weapons, Instruments)**
   a. Hard and blunt weapons
   b. Sharp cutting, sharp pointed and Sharp Heavy cutting weapons
   c. Firearm weapons
5. **Sexual offences :**
   a. Examination/Certification of Victim
   b. Examination/Certification of Accused
6. **Examination of Foetus to opine about age**
7. **Examination of Bones and teeth for Medico-legal purpose to determine age, sex, stature, cause of death, time since death**
   a. Skull and Mandible
   b. Scapula, Sternum and Upper limb bones
   c. Sacrum and hip bone/ Pelvic bone
   d. Lower limb bones

Study of:

8. **Medical certification of cause of Death as per Birth and Death registration Act [Prescribed Forms]**
9. **Studies of Skiagrams** for estimation of age, bony injury, foreign body, and pregnancy
10. **Photograph of different events of Medico-legal importance** and post-mortem changes
11. **Study of Various museum specimens** of medico-legal significance
12. **Study of Various slides** of medico-legal significance
13. **Demonstration of Instruments:**
    a. Used in treatment of acute poisoning cases
    b. Used for causing abortions
    c. Used for carrying out autopsy

[Standard human autopsy dissection Box/set]

Part 2 Forensic Toxicology

1. **Examination/Certification of Alcoholic [Prescribed Forms „A" &„B"]**
2. **Study of Common poisons:**

[Sulphuric Acid, Nitric Acid, Hydrochloric Acid**, Carbolic Acid and Oxalic Acid,** Sodium and Potassium Hydro-Oxide, **Phosphorous,** Lead, Arsenic, Mercury**, Copper, Glass powder, Castor, Croton,** Capsicum, Semicarpus Anacardium (Bhilawa), Calatropis Gigantea, **Abrus Precatorius (Ratti), Dhatura, Cannabis Indica, Opium,** Aconite, Yellow Oleander, Strychnine, **Snakes, Scorpion, Alcohol, Methyl Alcohol, Kerosene,** Barbiturates**, Organo-phosphorus compounds, Organo Chloro compounds, Carbamates (Carbaryl)] and other commonly used poisons, antidotes and preservatives**

Part 3 Medical Jurisprudence

Study of Medical Certificates [Prescribed Forms]

a. Sickness Certificate
b. Fitness Certificate
c. Certificate of Physical fitness
d. * Medical certificate prescribed under Mental Health Act : 1987
e. * Medical Certificate of Sound/ Unsoundness of mind.

Part – 4 Legal procedures in medico-legal cases

Study of the various prescribed Forms:

Consent to surgery Anaesthesia and other Medical services, Request for sterilization, Consent to access to hospital records, Authorization for Autopsy, **Dead body Challan used for sending a dead body for post-mortem examination,** Request for the second inquest by Magistrate on the dead body**, Provisional post-mortem certificate, Post-mortem form, Pictorial Post-mortem form, Form for the Final cause of death,** Forms for despatch of exhibits other than the viscera to chemical analyser, Forms for despatch of Viscera for Histopathological Examination, **Form for dispatch of viscera to chemical analyser,** Forensic Science Laboratory report form, Summons to witness.

Each student shall attend and record as a clerk

a. As many as possible cases / items of medico-legal importance
b. 10 cases of medico-legal autopsies

Both above „a" and „b" should be recorded in the approved Proforma in the single Journal. The Journal should be scrutinised by the teacher concerned and presented for the inspection and evaluation during the university examination.

Each student shall attend the court at least 2 cases when Medical Evidence is being recorded.

f. Books recommended

1. **Modi‟s Textbook of Medical Jurisprudence and Toxicology Ed. 22, 1999, by B.V. Subramanyam, Butterworth**
2. The Essentials of Forensic Medicine & Toxicology by K.S. Narayan Reddy
3. Parikh‟s Textbook of Medical Jurisprudence and Toxicology.
4. **Text Book of Forensic Medicine – J.B. Mukherjii VOL 1 & 2**
5. **Principles of Forensic Medicine - A. Nandy**
6. Toxicology at a Glance by Dr S.K. Singhal
7. Bernard Knight et. All: Cox‟s Medical Jurisprudence & Toxicology

Reference books

1. Russell S. Fisher & Charles S.Petty: Forensic Pathology
2. Keith Simpson: Forensic Medicine
3. Jurgen Ludwig: Current Methods of autopsy practice.
4. Gradwohl – Legal Medicine
5. A Doctors Guide to Court – Simpson
6. Polson C.J. : The essentials of Forensic Medicine
7. Adelson, L.: The Pathology of Homicide.
8. Atlas of Legal Medicine (Tomro Watonbe)
9. Sptiz, W.U. & Fisher, R.S.: Medico-legal Investigation of Death.
10. A Hand Book of Legal Pathology (Director of Publicity)
11. Taylor‟s Principles & Practice of Medical Jurisprudence. Edited by A.Keith Mant, Churchill Livingstone.
12. Ratanlal & Dhirajlal, The Indian Penal Code; Justice Hidayatullah & V.R. Manohar
13. Ratanlal & Dhirajlal, The Code of Criminal procedure; Justice Hidayatullah & S.P. Sathe
14. Ratanlal & Dhirajlal, The Law of Evidence; Justice Hidayatullah & V.R. Manohar
15. Medical Law & Ethic in India – H.S. Mehta
16. Bernard Knight : Forensic Pathology
17. Code of medical ethics : Medical Council of India, approved by Central Government, U/S 33 (m) of IMC Act, 1956 (Oct 1970)
18. Krogman, W.M.: The human skeleton in legal medicine.
19. FE Camps, JM Cameren, David Lanham : Practical Forensic Medicine
20. V.V. Pillay : Modern Medical Toxicology.

5. Evaluation

a. Methods

Theory, Practical & viva

b. Pattern of Theory Examination including Distribution of Marks, Questions, Time

Nature of Question Paper

Faculty with Year **:** ***SECOND MBBS***

Subject **:** **FORENSIC MEDICINE & TOXICOLOGY**

Paper **:** ***--***

Total Marks **:** ***40*** ***Time*** **:** ***2 Hours***

Section "A" (8 Marks)

Instructions:-

1) Fill (dark) the appropriate empty circle below the question number once only..
2) Use **blue/black** ball point pen only.
3) Each question carries **one / half mark.**
4) **Students will not be allotted mark if he/she overwrites strikes or put white ink on the cross once marked.**
5) Do not write anything on the blank portion of the question paper. If written anything, such type of act will be considered as an attempt to resort to unfair means.

Section "A" : MCQ (8 marks)

Question No.	Question Description	Division of Marks	Total Marks
1.	Total MCQs : 16	16 X ½	08

Section "B" & "C" (32 Marks)

Instructions:-

1) All questions are compulsory.
2) The number to the right indicates full marks.
3) Draw diagrams wherever necessary.
4) **Answer each section in the respective answerbook only. Answers written in the inappropriate sectional answer books will not be assessed in any case.**
5) Do not write anything on the blank portion of the question paper. If written anything, such type of act will be considered as an attempt to resort to unfair means.

Section "B" : BAQ (20 Marks)

Question No.	Question Description	Division of Marks	Total Marks
2.	**Brief answer questions** **(Attempt any five out of six)** a) b) c) d) e) f)	5 X 4	20

Section "C" : LAQ (12 Marks)

Question No.	Question Description	Division of Marks	Total Marks
3.	**Attempt any two out of three:** ***Long answer question only*** a) b) c)	2 X 6	12

c. Topic distribution in the theory paper

Section A & C: Forensic Medicine, Toxicology, Medical Jurisprudence, Legal Procedure
Section B: Forensic Medicine, Toxicology and/or Medical Jurisprudence

d. Marking scheme

As shown above

e. Nature of practicals and duration

Practicals ***Marks 30***
Report on: Six Exercises [With available resources] Time: About 2 hrs.

1. An Injured **OR** Age of the child
   OR An Alcoholic **OR** Sexual offence 07 Marks
2. Bone **OR** Determination of age of Foetus 05 Marks
3. Weapon 05 Marks
4. Certificate of Sickness, fitness **OR** Death. 05 Marks
5. Report on TWO Poison 04 Marks
6. Report on any TWO articles: [Skiagram **OR** Photographs **OR** Slides **OR** Museum Specimens **OR** Instruments] 04 Marks

TOTAL **30 Marks**

In respect of items 1 to 6, students will be expected to prepare their Reports as if they would be required to submit it to the investigating authority concerned within the time allotted, and the examiners will be assessing proficiency in skills, conduct of experiment, interpretation of data and logical conclusion. Emphasis should be on candidate‟s capacity in making observations and logical inferences in order to initiate enquiries in criminal matters and medico-legal problems.

f. Viva : duration and topic distribution

Viva-vocé: Time: About 20 Min

There will be TWO tables examining each student separately on the topics „a‟ and „b‟.

Viva	10 marks
Duration	20 mins
Four examiners	10 mins with each candidate
Two examiners	for topics a. Toxicology and Medical Jurisprudence
Two examiners	for topics b. Forensic Medicine and Legal Procedures

At each table marks given will be out of 5 and then added together (total out of 10)

g. Plan for internal assessment

The time-table for internal assessment will be as follows:

SCHEME OF INTERNAL ASSESSMENT WITH FREQUENCY OF EXAMINATIONS FOR THE BATCHES WHICH HAVE JOINED BEFORE JUNE 2001

Marks for internal assessment „A" shall be calculated on the basis of two mid terminals & three terminal college examinations conducted. During mid terminal (periodical examination) assessment should be done by MCQs of Single Best Response type.

Marks for internal assessment „B" shall be calculated on the basis of three terminal college examinations (7 marks) & day-to-day class practical work and Record (3 marks).

Department will maintain a register for periodic evaluation of their students. The internal assessment will be done separately for theory and practical examinations.

A total of 5 (five) examinations will be conducted as under:

FREQUENCY AND MARKING OF EXAMINATION FOR INTERNAL ASSESSMENT

Termwise distribution	**Theory/Practical (Total Marks)**
I Term	
One Midterm	15 / no practicals
1st Terminal	40 / 25
II Term	
One Midterm	15 / no practicals
2nd Terminal	40 / 40
III Term	
One term ending Preliminary	40 / 40

SCHEME OF INTERNAL ASSESSMENT WITH FREQUENCY OF EXAMINATION FOR THE BATCHES JOINING IN JUNE 2001 AND LATER

I term

1st term ending: After 120 teaching days (Theory and Practicals)

II term

2nd term ending: At the end of the 2nd term (Theory and Practicals)

III term

Prelims examination on the basis of University pattern -Theory, Practicals and Viva
(Minimum 4 weeks gap mandatory between Preliminary and University examinations)

For the terminal theory examination students will be evaluated by a combination of 28 MCQs (each worth 1/2 mark), 6 SAQs (each of 2 marks with an option of 6 out of 7) and 2 LAQs (option of 2 out of 3 each worth 7 marks). The total time allotted for this 40 marks paper will be 2 hours.

This will be followed by practicals (total time 1½ hours). The marks for the I term practicals will be 25 and for the II term will be 40.

To familiarize the students with the „viva-vocé", for the I term the marks for the practicals may be kept as 15, while 10 marks be reserved for viva on theory topics (total 25 marks); for the II term the marks for the practicals may be kept as 30, while 10 marks be reserved for viva on theory topics (total 40 marks).

Prelim pattern will be as per the University exam.

REVISED INTERNAL ASSESSMENT EXAMINATION SCHEME w.e.f. JUNE 2007 EXAMINATION

YEAR :- Second MBBS

SN	Subject	1st Term End			2nd Term End			Preliminary Examination		
		Semester	Theory	Practical	Semester	Theory	Practical	Semester	Theory	Practical
			(A)	(B)		(C)	(D)		(E)	(F)
1.	Pharmacology	III	50	40	IV	50	40	V	80	40
2.	Pathology	III	50	40	IV	50	40	V	80	40
3.	Microbiology	III	50	40	IV	50	40	V	80	40
4.	FMT	III	20	20	IV	20	20	V	40	40

(B) Calculation Method:-

I) Theory Marks to be send to the University out of 15 Except FMT $= \frac{(A)+(C)+(E)}{12} = \frac{50+50+80}{12} = \frac{180}{12} = 15$

II) Practical Marks to be send to the University out of 15 Except FMT $= \frac{(B)+(D)+(F)}{8} = \frac{40+40+40}{8} = \frac{120}{8} = 15$

III) For FMT Theory Marks to be send to the University out of 10 $= \frac{(A)+(C)+(E)}{8} = \frac{20+20+40}{8} = \frac{80}{8} = 10$

IV) For FMT Practical Marks to be send to the University out of 10 $= \frac{(B)+(D)+(F)}{8} = \frac{20+20+40}{8} = \frac{80}{8} = 10$

Annexure 1C

ORIENTATION CAMP – 2015
TEACHING SCHEDULE

Date	Day	9.30 a.m. to 10.00 a.m.	10.00 a.m. to 12.00 noon		2.00 – 3.00 p.m.	3.00 - 4.00 p.m.
16.07.2015	Thursday	**Inaugural Function at Shanti Bhawan, Gandhi Ashram, Sewagram**			History of Sevagram Ashram	
17.07.2015	Friday	Recap of previous day	Introduction of KHS (10-11) & MGIMS (11-12)		Doctor- Patient Relationship – Dr. I. L.Khandekar	Personal Professional Development – Medical Education Unit
18.07.2015	Saturday	Recap of previous day	BBL Mathur Essay completion	Gandhian Thought (11-12.30)	Documentary on Gandhiji	
19.07.2015	Sunday	**Workshop on Bioethics & Communication Skills**				
20.07.2015	Monday	Recap of previous day	Gandhian Thought		Anatomy	Gandhian Thought
21.07.2015	Tuesday	Recap of previous day	Gandhian Thought		Physiology	Gandhian Thought
22.07.2015	Wednesday	Recap of previous day	Gandhian Thought		Biochemistry	Gandhian Thought
23.07.2015	Thursday	Recap of previous day	Gandhian Thought		Commu. Medicine	Gandhian Thought
24.07.2015	Friday	Recap of previous day	Gandhian Thought		Anatomy	Gandhian Thought
25.07.2015	Saturday	Recap of previous day	Gandhian Thought		Physiology	Gandhian Thought
26.07.2015	Sunday	**Visit to Geetai Mandir and Pavnar Ashram**				
27.07.2015	Monday	Recap of previous day	First Aid		Biochemistry	Stress Management – Dept. of Psychiatry
28.07.2015	Tuesday	**Workshop on values in Health care – A Spiritual approach (VIHASA)**				
29.07.2015	Wednesday	Recap of previous day	Examination on Nature Cure (10-11)			
30.07.2015	Thursday	**Valedictory Function**				

Note: - Change if any will be notified.
* Classes on Gandhian Thought will be arranged by Director, Instt. Of Gandhian Studies, Wardha.
** Dr. Subodh S. Gupta to coordinate with Deptt. of Anaesthesiology/MET/Students Council

Dr .Ramesh Pawar
Officer-In-Charge
Orientation Camp – 2015

Dr. Subodh S. Gupta
Professor, Community Medicine
Supervisor, Ori. Camp 2015

7/7/15
Dr. K.R. Patond
Dean
MGIMS, Sewagram

Copy to:-
Head of Department – Anatomy, Physiology, Biochemistry, Community Medicine. Psychiatry, Anaesthesiology, Forensic Medicine.
Director, Instt. Of Gandhian Studies, Wardha

Annexure 1E

Schedule for ROME (Re-Orientation of Medical Education) Camp January 2016at KRHTC, Anji (M)							
Date	**8am – 9am**	**9am - 11am**	**11am - 1pm**	**3pm - 4pm**	**4pm - 5pm**		**8.30 pm – 9.30pm**
30 Dec 15 Wednesday	Introduction and Briefing about ROME camp activities	ROME Camp: The Concept Dr. BS Garg/ Dr. AM Mehendale	Workshop on Rapid Survey Methodology				Medico-social history taking
31 Dec 15 Thursday	Primary Health Care	Pediatrics Clinics OBGY Clinics	OBGY Clinics Pediatrics Clinics	Understanding our Health System at District level			New Year Celebration
01 Jan 16 Friday	Introduction to JSY, JSSK & RGJAY: PGs	Medicine clinic Surgery Clinics	Surgery Clinics Medicine clinic	NBCP: Dr A K Shukla	Interaction with JSY & JSSK Beneficiaries		Tool finalization for RS
02 Jan 16 Saturday	Vaccine preventable diseases	National Polio Surveillance Project : Dr Thosar		RCH Program (interactive session): PGs			Educational Video
03 Jan 16 Sunday	Educational Tour						Discussion on PHC visit checklist
04 Jan16 Monday	Health Management Information System			Cluster Survey			Hands on EPI Info and Data entry of RS
05 Jan16 Tuesday	Quality Assurance in health care	Visit to PHC		NHM: DHO	Interaction with ASHA		Life Skills: PG
06 Jan16 Wednesday	Understanding Immunization in different	Subcenter visit		Cluster Survey (2pm-6pm)			Data entry -2

DCM

	situations				
07 Jan 16 Thursday	Introduction to ICDS :PGs	Anganwadi Visit & Discussion on ICDS :CDPO	Interaction with District Tuberculosis Officer		Feedback from students on AWC visit
08 Jan 16 Friday	National AIDS Control Program	National Program For Prevention and Control of Cancer, Diabetes, Cardiovascular Disease and Stroke	NVBDCP: DMO and Team and interaction with service user		Data analysis
09 Jan 16 Saturday	School Health Services	School Health Education	Adolescent Health		Preparation for final presentation
10 Jan 16 Sunday	Health Equity	Preparation for Final Presentation			Preparation for final presentation
11 Jan 16 Monday	Shifting to Sewagram for Valedictory function		Valedictory function at SN Hall MGIMS		

Professor & Head
Dept. Community Medicine
MGIMS, Sewagram

Schedule for ROME (Re-Orientation of Medical Education) Camp January 2016 at RHTC Bhidi

Date	8am – 9am	9am - 11am	11am - 1pm	3pm - 4pm	4pm - 5pm	5pm – 7pm	8:30pm – 9:30pm
30th Dec 15 Wednesday	Introduction and Briefing about ROME camp activities	ROME Camp: The Concept Dr. BS Garg/Dr. AM Mehendale	Workshop on Rapid Survey Methodology				Medico-social history taking
31st Dec 15 Thursday	Primary Health Care	Medicine clinics / Surgery clinics	Surgery clinics / Medicine clinics	Understanding our health system at district level			New Year Celebration
1st Jan 16 Friday	Introduction on JSY and JSSK and RGJY: PGs	Pediatrics Clinics / OBGY Clinics	Obs & Gyn Clinics / Pediatrics Clinics	Interaction with ASHA			Tools finalization for RS
2nd Jan 16 Saturday	RCH Programme (Interactive Session) : PGs			National Polio Surveillance Project and Newer Vaccines:(Dr.Thosar)		Cluster Survey: Bhidi	Hands-on EPI info/ Data entry
3rd Jan 16 Sunday	Workshop on youth Development			Interaction with JSY and JSSK beneficiaries			Discussion on PHC visit Checklist
4th Jan 2016 Monday	Visit TO PHC and feedback from students						Data entry / Preparation for school health
5th Jan 16 Tuesday	Functioning of Rural Hospital	Visit to Rural Hospital		Cluster Survey			Data entry / Preparation for school health
6th Jan16 Wednesday	ICDS Schemes: Interactive session by PGs	Anganwadi Visit Discussion on ICDS and Interaction with Anganwadi Staff		NVBDCP: Dr. Dhakate (DMO)			Educational Videos
7th Jan 16 Thursday	*VHND*	Visit to VHND		*NHM:DHO*			Data entry / Preparation for school health
8th Jan 16 Friday	NACO:PGs	School Health Education by students through acts and role plays		RMNCHA+ Dr.Amale and Dr.Paradkar			Educational Videos
9th Jan 16 Saturday	*VHND*	*Visit to Sub-Centre and interaction with staff*		NBCP: Dr. AK Shukla			Preparation for final presentation
10th Jan 2016 Sunday	Educational Tour						Preparation for final presentation
Shifting to Sewagram for Valedictory function		Valedictory function at SN Hall MGIMS form 3 PM onwards					

Dr. R. D. Pawar
In-Charge
Rural Health Training Centre, Bhidi

Dr. P.R.Deshmukh
Supervisor
Rural Health Training Centre, Bhidi

Dr. A.M.Mehendale
Prof and Head
Dept. of Community Medicine

Annexure 1F

भारतीय आयुर्विज्ञान परिषद
MEDICAL COUNCIL OF INDIA

पॉकेट – 14, सेक्टर – 8, द्वारका, नई दिल्ली – 110 077
Pocket – 14, Sector – 8, Dwarka, New Delhi – 110 077

(1933 - 2008)

No. MCI-Academics/2015/ 116544 Date: 16/06/2015

To

1. Deans/Principals, All medical colleges (as per list attached)
2. Conveners of MCI Nodal Centres (as per list attached)
3. Conveners of MCI Regional Centres (as per list attached)

Sub: **Launching of Attitudinal & Communication Compentencies (ATCOM module) for Indian Medical Graduate: consititution of "Curriculum Committee: Recommendation's of the Academic Committee meeting held on 15.05.2015 and decision of Executive Committee meeting held on 04 June, 2015: reg**

Madam/Sir,

The Academic Committee meeting held on 15.05.2015 approved the recommendations of the Joint meeting of the Reconciliation Board and Expert Group held on 04th March, 2015 with reference to Constitution of Curriculum Committee in all medical colleges for implementation of Attitudinal & Communication Compentencies (ATCOM module) for Indian Medical Graduate. The decision is as under:

> "....
> *Deans of all medical colleges would constitute a 'Curriculum Committee', under intimation to Conveners of respective Nodal Centre/Regional Centre, for implementation of the ATCOM and CBME module. The composition of the Curriculum Committee would be as under:-*
>
> 1. *Professor / Associate Professor of Pre-clinical specialty*
> 2. *Professor / Associate Professor of Para-clinical specialty*
> 3. *Professor / Associate Professor of Medical specialty*
> 4. *Professor / Associate Professor of Surgical specialty*
> 5. *MEU coordinator of the college*
> 6. *Representative of students and interns*
> 7. *Dean / Principal to act as Chairman of the Committee*
>
> *The constitution of the Committee would be completed by August 2015. The nominated members of the Curriculum Committee will undergo training in Advance Course and in the two-day orientation Programme on Attitudinal and Communication modules in the academic year 2015 at the respective Nodal/Regional Centres to which the concerned medical college is allocated for Faculty Development Programme, at their own expenditure. The Dean/principal of the college, as Head of Curriculum Committee, at the end of each Academic year, will send a duly signed Annual Report of the training programme on ATCOM module and its effective implementation undertaken in each medical college, to the concerned Nodal/Regional Centre. The Nodal/Regional would summarise reports from all college sunder their charge and send it to the Academic Cell, MCI.*
> ....."

The above recommendations were approved by the Executive committee meeting held on 4.06.2015.

The Deans/Principals of all medical colleges are hereby directed to comply with the above decision.

Yours faithfully,

(Dr. Rewa Nayyar)
Secretary i/c

दूरभाष / Phone: +91-11-25367033, 25367035, 25367036 फैक्स / Fax: +91-11-25367024
ई-मेल / E-mail: mci@bol.net.in , contact@mciindia.org वेबसाईट / Website: www.mciindia.org

Annexure 1G

C/Gen/ 2194
Office of the Dean
MGIMS, Sevagram
Dated : 01/07/2015

CIRCULAR

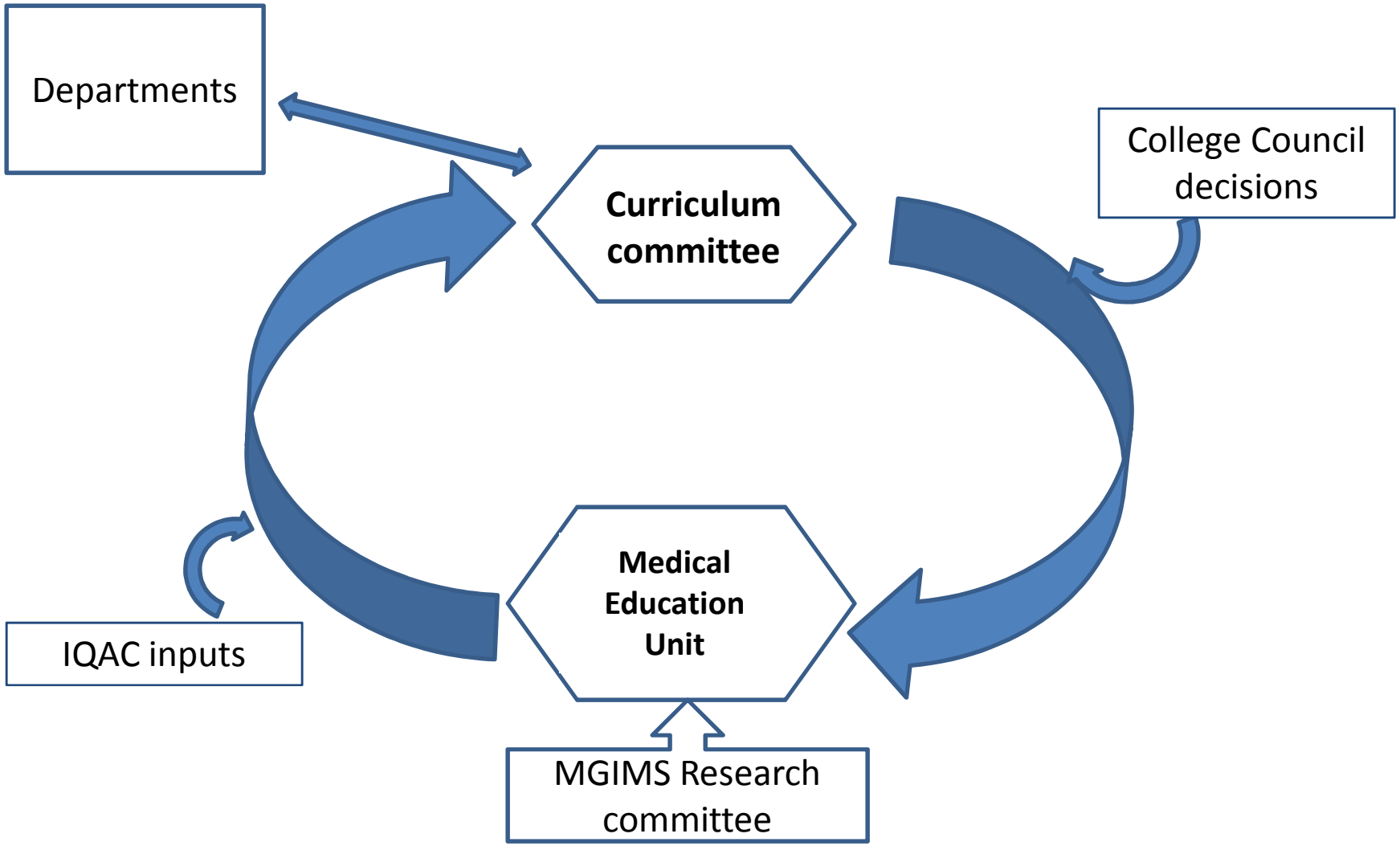
As per the letter No. MCI-Academics/2015/116544 dated 16/06/2015 received from Medical Council of India (copy enclosed). The Curriculum Committee is re-constituted with effect from 01-07-2015. The composition of the Curriculum Committee will be as under :

Chairman	:	Dean
Co-ordinator/convenor	:	Dr. Anupama Gupta, Professor, Pathology
Members	:	Head of the Departments of Anatomy
	:	Physiology
	:	Biochemistry
	:	Forensic Medicine
	:	Pathology
	:	Microbiology
	:	Pharmacology
	:	Community Medicine
	:	ENT
	:	Ophthalmology
	:	Surgery
	:	Medicine
	:	OBGY
	:	Orthopaedics
	:	Paediatics
MEU coordinator of the College	:	Dr. Subodh Gupta, Professor, Com. Med.
Representative of student	:	Ms. Poshika Agrawal
Representative of Intern	:	Dr. Minal Bhadrige

Dr. K. R. Patond 2/7/15
Dean

Copy to: All concerned
Students Section

Working of Curriculum Committee in relation to other bodies



Annexure 1I

Minutes of the meeting (23/07/2015)

UG curriculum Committee, MGIMS, Sevagram

The meeting was conducted under the chairmanship of the honorable dean Dr K R Patond

Following members were present:

Dr Anupama Gupta- Coordinator

Dr M Shende

Dr MVR Reddy

Dr P N Murkey

Dr Sushil Kumar Varma

Dr Vijayshri Deotale

Dr A M Mehendale

Dr U N Jajoo

Dr K V Vilhekar

Dr Dilip Gupta

Dr Poonam Varma

Dr P S Nagpure

Agendas of the meeting were:

1. To nominate four persons from faculty to represent four specialties according to new MCI guidelines:
   a. Preclinical
   b. Paraclinical
   c. Medicine and allied subjects
   d. Surgery and allied subjects

2. To approve the new body of curriculum committee: MEU coordinator, student and intern representatives
3. To discuss improved coordination between departments for decreasing repetition of certain topics in more than one departments.
4. Any other agenda with the permission of the honorable chairperson.

Chairman welcomed newly formed body of curriculum committee.

Committee had three representatives across the MBBS course Dr A Shende, Dr Suchil Kumar and Dr P Nagpure. Dr M Shende and Dr Sushil Kumar wished to be relieved from this post now and the committee consented with appreciation of their services.

Members suggested the names of representatives from four specialties and a consensus was reached on the following names:

a. Preclinical – Dr MVR Reddy
b. Paraclinical- Dr Vijayshri Devtale
c. Medicine and allied subjects- Dr Jyoti Jain (confirmed on telephone later)
d. Surgery and allied subjects- Dr Nagpure will continue

Dr Subodh Gupta, coordinator MEU has joined the committee as per MCI guidelines

Two student representatives Dr Minal Bhadrige and Ms Poshika Agrawal are selected as committee members as per guidelines of MCI, on the basis of Merit in Final MBBS and prefinal MBBS respectively.

Committee approved all these names after discussion.

The idea of more coordination between teaching of various departments was taken with lots of apprehensions. Few members said that it is not possible at all due to logistic hurdles as topics are not taught in a tight pre decided manner and it depends a lot on availability of a teacher at that particular time and involvement of students.

Dr Dilip Gupta Suggested that after opening of E-learning modules for students, this coordination may be achieved at that platform and teachers can interact between themselves in a much better way.

Dr Poonam varma shivkumar said that the integrated teaching is enough for the topics which need collaboration of more than one department and no further coordination would be fesible.

Dr Sushil Kumar also said that it is not feasible now. E-learning will open new avenues possibly.

Committee appreciated Dr A M Mehendale for chairing curriculum committee for last 15 years and coordinating Interdepartmental issues regarding UG teaching so efficiently. The Dean requested him to help and guide committee members in the future also.

A few other agendas were also put up by members:

Dr Reddy informed that the self learning program for first year students is running successfully when this query was raised by the chairman.

Dr Poonam requested to decrease the number of batches attending clinical posting in a department at one point of time. She said that managing 3-4 batches at time is becoming difficult now because of

faculty postings in Melghat and GMLF. She further said that sometimes there are no batches posted at all in her department. Students are not coming for evening clinics also.

The matter is under scrutiny at present.

Dr Dilip Gupta queried regarding female observer at the time of PG examinations if a female candidate is appearing. The Chairman assured that if the Dean office is been informed one week prior to the date of examination, a female observer will be deputed for the same.

Dr Dilip also requested to provide a blackboard in the Psychiatry Lecture hall. The chairman promised to arrange it after talking to HOD Psychiatry.

The chairperson enquired whether we can start a certificate course or a diploma course in E-learning through Dr Sushila Nayar School of Public Health. Or should we proceed for obtaining recognition from MUHS for this course and get credit points from MMC for the faculty training workshops on e-Learning.

Dr Subodh informed that at present we are not trained enough and have no certified trainers to start any such course but this may be explored after we complete faculty training and establish E-learning platform successfully in the campus. He will try to explore the chances of getting credit hours from MMC.

The Meeting was concluded with the Thanks to all present.

Dean
27/2/15

Following Crriculum Committee members :-b

1. Dr. K.R. Patond, Dean
2. HOD, Anatomy
3. HOD, Phvsiology
4. HOD. Biochemistry
5. HOD, Forensic Medicine
6. HOD, Pathology
7. HOD, Microbiology
8. HOD, Pharmacology
9. HOD, Community Medicine
10. HOD, ENT — P. Kaur
11. HOD, Ophthalmology
12. HOD, Surgery
13. HOD, Medicine
14. HOD, Obst. & Gynae
15. HOD, Orthopedics
16. HOD, Paediatrics
17. Dr. Anupama Gupta, Cordinator – Curriculum Committee
18. Dr. Subodh Gupta, Prof. Comm. Medicine

CC/3157
19/8/2016

A meeting of UG curriculum committee was held on 12/02/2016 in the committee room, Dean's office.

The fo llowing were present:

1. Dr K R Patond

2. Dr Vijayshri Deotale

3. Dr P S Nagpure

4. Dr Subodh Gupta

5. Dr Anupama Gupta

The discussion held and decisions taken were as under-

1. The chairperson welcomed the new members of UG curriculum committee constituted according to the guidelines provided by MCI. Some of the members could not attend the meeting being out of the town for various reasons.

2. Dr Subodh Gupta and Anupama Gupta who recently attended ATCOM module of MCI at the nodal centre informed about the newer attitude and communication modules prepared by the MCI and suggested some relevant modules in our UG syllabus. Though we are giving our students enough exposure to such soft skills at various platforms already but inclusion of some of these new modules will be beneficial to our students. The suggestion was to include them in the time allotted for integrated teaching. Honorable chairperson will be informing about them in college council meeting to develop a dialogue on this issue among all faculty members.

3. Dr Anupama requested all members of curriculum committee to enroll for next revised basic course in MET and fellowships afterwards, as it has made mandatory by MCI.

4. HODs of para-clinical departments informed that some of the introductory classes of Medicine and Surgery for III semester are not regularly conducted. Honorable chairperson asked Dr Anupama to talk to HODs of both the departments to decide how to make them useful for students.

5. A student named Harendra Beend joined the college after a long leave owing to some legal matters. It was decided that he will join the 2013 regular batch for II MBBS classes.

5. The chairperson thanked all the members.

DEAN
Mahatma Gandhi Institute of
Medical Sciences, SEVAGRAM

Annexure 1J

MGIMS FACULTY WHO ARE UNIVERSITY REPRESENTATIVES
AT MAHARASHTRA UNIVERSITY OF HEALTH SCIENCES

Acting Pro-Vice Chancellor of MUHS Nashik (5 Feb-24 Mar 2014)
Dr Nitin Gangane

Management Council
Dr Nitin Gangane

Academic Council
Dr Nitin Gangane

Faculty of Medicine
Dr Nitin Gangane
Dr MVR Reddy

Chairperson, Board of Studies, Para clinical (PG) Board
Chairman, Technical Advisory Committee
Chairman, Research grant screening committee
Chairman, Vehicles committee
Chairman, Rules and Regulations committee for recruitment of faculty
Chairman, Committee for framing directions for service condition of teachers at affiliated colleges
Member, finance and accounts committee
Member, Budget committee
Member, Grievance committee
Member of Board of Research, 2010-12
Member of Board of Medical Education disciplines
Member Board of Genetic studies
Dr Nitin Gangane

Board of Studies

1. Dr Nitin Gangane
2. Dr MVR Reddy
3. Dr Sushil Kumar
4. Dr Satish Kumar
5. Dr S Kar
6. Dr Atul Tayade
7. Dr Dilip Gupta
8. Dr Anshu

Annexure 1K

REPORT TO BE SUBMITTED BY THE FACULTY FOR APPROVAL OF VISITED NGO UNDER RURAL PLACEMENT SCHEME OF MAHATMA GANDHI INSTITUTE OF MEDICAL SCIENCES SEWAGRAM, WARDHA, MAHARASHTRA

Name :

Address :

Ph.No./Fax No.(Code) :

E-Mail.ID :

Hospital falls under the Municipality limits or under Gram Panchayat :

Whether it is registered under Society's Registration Actor Public Trust or is it a Private Hospital :

Base Hospital with Address :

Total Beds :
Facilities Available :

P e r s o n n e l

Faculty (Speciality Wise) :

Resident : Nurses :

Security : Others :

I n f r a s t r u c t u r e
Outpatient :
(No.of rooms and examining chambers)

Wards (Gen,Pvt,ICU) :

O.T.(No.of rooms/Tables) :

Others :

Equipments available :

General :

ICU :

OT :

OPD Attendance Per Month

Medicine	:	Paediatrics	:
Surgery	:	Orthopaedics	:
Obst & Gynae	:	ENT	:
Ophthalmology	:		

Admissions per day

Medicine	:	Paediatrics	:
Surgery	:	Orthopaedics	:
Obst & Gynae	:	ENT	:
Ophthalmology	:		

Operations	:	**Per day**	**Per Month**
Major			
Minor			

Births

Vaginal : Caesarian Section :

Outreach activities :
Area being catered to :
Services offered :
Manpower :
Infrastructure :

Please attach schedule of outreach services being provided

Ambulance : Yes / No

Working : Non-working :

Driver :

Duty hrs.of Doctors :

Emoluments : 1st year 2nd Year

Accommodation : Type/ HRA deducted / Free / Rented with Rent paid or not paid

Meals : Tea/Breakfast/Lunch/Dinner

Leave

1st year :

2nd year :

Interacted with :

Overall Remarks **:**

Dated **(Signature - Visiting faculty)**

FEEDBACK FORM OF RURAL PLACEMENT CENTRE FROM STUDENTS

FEEDBACK OF THE NGO BY : DR.

YEAR :

NAME OF THE NGO :

TYPE OF WORK IN THE NGO: More than Adequate/ Just Adequate/ Poor

CLINICAL EXPOSURE : Good / Fair/ Poor

OUTREACH ACTIVITIES OF THE NGO : Good / Fair/ Poor

WHICH SPECIALTY IS THE STRENGTH OF THE NGO :

DO YOU RECOMMEND THE NGO FOR CONTINUATION IF NOT, WHY/ :

WAS YOUR EXPERIENCE IN THE NGO (FRUITFUL OR NOT) WHAT HAS BEEN GIVEN TO YOU IN TERMS OF SKILL :

ACADEMIC/SERVICE ENVIRONMENT :

BEHAVIORS OF SENIOR/ OTHER STAFF OF NGO

REMARKS IF ANY :

(SIGNATURE WITH DATE)

EDUCATION FOR HEALTH

ORIGINAL RESEARCH PAPER

An Evaluation of ROME Camp: Forgotten Innovation in Medical Education

AR Dongre, PR Deshmukh, SS Gupta, BS Garg

Dr Sushila Nayar School of Public Health, Mahatma Gandhi Institute of Medical Sciences, Sewagram, Wardha, India

Published: *April 2010*

Dongre AR, Deshmukh PR, Gupta SS, Garg BS

An Evaluation of ROME Camp: Forgotten Innovation in Medical Education
***Education for Health*, Volume 23, issue 1, 2010**

Available from: http://www.educationforhealth.net/

ABSTRACT

Background and Objectives: Mahatma Gandhi Institute of Medical Sciences (MGIMS), Sewagram, India's first rural medical institute, has been implementing its community-based public health teaching with the aim of building a physician workforce for the rural poor. For the past four decades, the MGIMS has organized and run the Re-orientation of Medical Education (ROME) camp for final year medical undergraduates at one of the rural centres of the department of Community Medicine. The objectives of the present study were to learn students' perceptions of the value and effectiveness of various components of the ROME camp and learn the factors they perceive facilitate and inhibit learning.

Methods: A mixed-method research design of quantitative (survey) and qualitative (force field analysis) methods was used. The study participants were all 61 of the final year medical undergraduates participating in the ROME camp in 2008. The quantitative data was analyzed using SPSS software package and summative content analysis of the qualitative data was undertaken.

Results: Students were generally very positive about all aspects of the camp and its component parts. The greatest consensus (88.9%, on a 0 to 100% scale) was for the contribution to student learning of the visit to the Primary health centre and Sub-centre, as offering direct exposure and interaction with the village-level service providers. There was poorer consensus for students' involvement with the field-based clinics, as this was felt by some not to contribute significantly to their understanding of socio-economic and environmental factors related to cases (78.8%) and their ability to diagnose health problems in resource poor settings (76.5%). The major strength of the camp was felt to be its exposure visits and hands-on experiences in surveys and interaction with village-level health care providers. Students reported poor interactions with teachers in some educational sessions, including the field-based clinics and classes on theories of national health programs.

Conclusions: The curriculum of the ROME camp was generally well regarded by students, but based on their views it should emphasize interactive theory sessions. The ROME scheme can be revitalized in all medical colleges as it is an effective practical approach for teaching public health principles and practice to medical students.

Keywords: Re-orientation of Medical Education, camp, curriculum, community-based teaching, integrated teaching

Introduction

Medical education in India has been inherited as a British legacy. In this system, rural orientation and practical exposure of medical undergraduates to the health care delivery system and field realities is lacking. One promising way to address this lack would be to revitalize public health teaching and make it responsive to the existing deficiencies in India's health care system[1]. The Re-orientation of Medical Education (ROME) program of the World Health Organization for Asian countries was aimed at developing medical education system responsiveness and relevance to the needs of a country by making necessary curriculum changes. The Government of India took initiative in 1977 by launching the 'Re-Orientation of Medical Education' (ROME) scheme to impart community-oriented training to medical undergraduates in primary health care. Over the period from 1977 to now, almost all medical colleges ceased its implementation. One reason for its failure was that colleges did not update their programs[2]. One exception has been the Mahatma Gandhi Institute of Medical Sciences (MGIMS), Sewagram, which has continued to implement the ROME camp for medical undergraduates with contextual modifications (figure 1) implemented in line with the recommendations of the Medical Council of India[3].

The MGIMS, Sewagram is India's first rural medical institute, supported by both the Central and State Government and based on Gandhian ideology. The MGIMS admits 65 medical students each year from all over India on the basis of a pre-medical entrance test. It has been implementing its community-based public health teaching with the aim of training doctors for work with the rural poor. It orients students to the prevalent public health problems of rural areas and empowers students with the necessary social, medical and public health skills through curricular innovations such as orientation camp for early students, social service camp in villages, a village adoption scheme, ROME camp, rural orientation during internship, and two years required rural service before graduates are allowed to pursue post-graduate training at MGIMS[4].

Garg et al.[5] have described the community-based teachings at the MGIMS, including the ROME camp. The camp is an integrated approach to public health and clinical disciplines where the field clinics for students are arranged within the patient's house. The camp curriculum focuses on primary health care and attempts to create conditions for the students to gain a hands-on understanding of the nature of rural health problems. Such community-based teaching for medical undergraduates is seldom practiced in India. The MGIMS has organized the ROME camp for the last four decades. During that time, no systematic effort has been made to evaluate its curriculum from the students' perspective. The World Federation of Medical Education (WFME) Global Standards recommends that students should participate in the design, management and the evaluation of their curriculum. The information on students' perspectives is useful for developing and refining a quality and effective educational program[6]. Hence, the objectives of the present study were to learn students' perceptions of the value and effectiveness of various components of the ROME camp curriculum and to explore the factors they perceive work for and against their learning at the ROME camp.

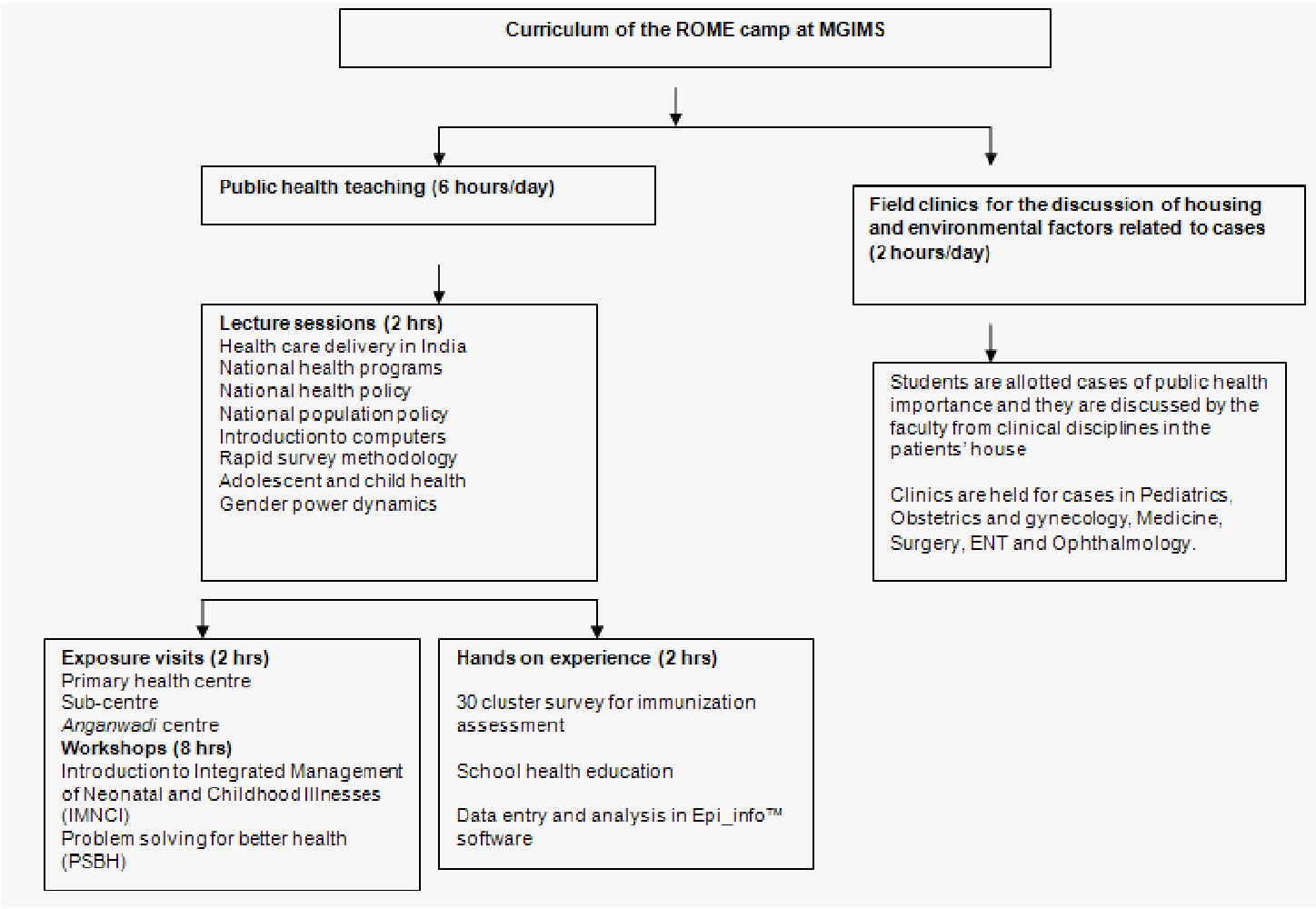


Figure 1: Community based teaching in the ROME camp for final year medical students

Methods

Study setting: The present study was undertaken at the Rural Health Training Centre, Bhidi, which is a peripheral centre of MGIMS, Sewagram. It is located in the Wardha District, Maharashtra State, India, about 760 km east of the state capital, Mumbai. The study was undertaken at the end of the 12-day ROME camp in November, 2008.

Study participants and design: The study participants were the group of 61 final year medical undergraduates participating in the ROME camp. A mixed-method research design of quantitative (survey) and qualitative (force field analysis)[7] methods was used.

Data collection methods: The quantitative data was collected with a questionnaire with banks of questions using a five-point Likert scale[8]. Two teaching faculty members of the Department of Community Medicine designed 14 questions for the questionnaire. It was 'face validated' by obtaining expert opinion from the Head of the Community Medicine Department. It was pre-tested by cognitive interviewing of ten senior medical undergraduates to identify ambiguous wording and 'double barreled'

questions. After obtaining informed consent at the end of camp, all medical undergraduates were asked to take the self-administered questionnaires to report their views of the educational value of various parts of the ROME camp curriculum. To minimize 'social desirability bias' where the respondents try to please the interviewer, appear helpful and avoid socially unacceptable responses, the questionnaire did not collect personal information from subjects, such as names, ages, sex and roll number.

In a second data gathering approach, a trained teaching faculty member facilitated a force field analysis exercise[6] with 19 purposively selected students who were willing to participate and who had attended all sessions during the camp period. This exercise was used as a technique to uncover the factors that students perceived worked for and against learning at the camp. After obtaining informed consent, all 19 participating students were asked to individually list statements of the factors they perceived fostered and hindered learning during the camp period. Next, all 19 students were given an opportunity to freely talk and share their experiences in a flexible group discussion lasting one hour. Finally, all responses were compiled and presented.

Ethical clearance was obtained from the Institutional Ethics Committee of the MGIMS.

Data analysis: The quantitative data was analyzed using SPSS (Chicago, IL, USA) software package version 12.0. A consensus measure, expressed in percentage, was obtained for each of the items. Values at the upper end of the range indicated more "agreement" than values at the lower range. A value closer to 1.0 or 100% has less dispersion around the weighted mean value and indicates greater agreement. Low consensus values were identified through high dispersion around the mean value[9]. Values above 80% were considered to reflect good consensus and below 80% were considered to reflect poor consensus.

A summative approach to qualitative content analysis was undertaken to identify and quantify certain themes from the text data and infer meaning in the given context[10]. The unit of analysis was students' individual statements. Statements with similar meaning were grouped together until a point was reached where further collapsing would cause a loss of qualitatively important information. The data was classified and quantified as simple non-hierarchical typology of various for and against perceptions. To increase the integrity of the process, two Community Medicine faculty members who were well versed in qualitative research methods carried out the analysis. The first author performed the initial content analysis and the second author reviewed it. Any disagreements between the two were resolved through discussion.

Results

All 61 students participated in the survey questionnaire. Out of 61 students, 38 (62.3%) and 23 (37.7%) were male and female, respectively. The majority, 39 (63.9%) were from rural family backgrounds and the remaining 22 (36.1%) had urban family backgrounds. About 31 students (50.8%) were from the state of Maharashtra and the remaining 30 (49.2%) were from the other states of India. The mean age of the responding students was 21.39 (±1.26 standard error) years.

Students were generally very positive about all aspects of the camp and its component parts. The consensus measures ranged from minimum 76.5% to maximum 88.9% for the 14 items in the questionnaire. The maximum consensus (88.9%) was for the exposure visit to the Primary health centre and Sub-centre, as they provided direct interactions with the village level service providers. This was followed by the consensus on the value of exposure to field surveys, hands-on experience in school health education (86.6%) and skills-based Integrated Management of Neonatal and Childhood Illnesses (IMNCI) training (85.6%) during the camp period. Notably, there was an 85.6% consensus for the overall teaching approach of the camp period. The consensus values for exercises

relating to the software Epi_info™, specifically for its hands-on experience and data entry, were 82% and 80.1%, respectively. There was 82.2% consensus for the community-based camp approach for teaching the subject of Community Medicine. (Table I).

There was poorer consensus for the field-based clinics (78.8%), as some students did not perceive these contributing much to their understanding of socio-economic and environmental factors related to cases nor contributing much to their ability to diagnose health problems in resource poor settings (76.5%). The consensus for utility of the theory class on national health programs was 78.7%. (Table I).

Table I: Medical students' (n=61) opinion about various aspects of the ROME camp curriculum, n (%)

n	Strongly agree	Agree	Neither agree nor disagree	Disagree	Strongly disagree	Consensus %
Session on rapid survey methodology was useful	24 (39.3)	34 (55.7)	2 (3.3)	1(1.6)	-	84.8
Exposure visit to Primary Health Centre, Sub-Centre was useful to understand health care delivery in India	39 (63.9)	22 (36.1)	-	-	-	88.9
Participation in field surveys improved our understanding for survey technique	35 (57.4)	24 (39.3)	1(1.6)	-	1 (1.6)	86.8
Hands-on experience on Epi_info™ was useful	17 (27.9)	36 (59.0)	6 (9.8)	2 (3.3)	-	82.0
Field clinics helped us to learn socio-economic and environmental factors related to case	12 (19.7)	31 (50.8)	11(18.0)	5 (8.2)	2 (3.3)	78.8
Visit to *Anganwadi* centre was useful to understand Integrated Child Development Scheme	33 (55.0)	20 (33.2)	5 (8.3)	2 (3.3)	-	82.8
Theory class on National Health Programs contributed to our understanding	10 (16.4)	37 (60.7)	13 (21.3)	1 (1.6)	-	78.7
School health education was practice of Behavior Change Communication	35 (57.6)	23 (39.0)	1 (1.6)	-	1 (1.6)	86.8
Integrated Management of Neonatal and Childhood Illnesses workshop was skilled based training to manage neonatal and childhood illness (n=34)	25 (73.5)	6 (17.6)	3 (8.8)	-	-	86.6
Teaching methods in camps supported our learning	20 (32.8)	40 (65.6)	1 (1.6)	-	-	85.9
Data entry and analysis was useful exercise	15 (24.6)	31 (50.8)	8 (13.1)	6 (9.8)	1(1.6)	80.1
Camp-based approach was useful for learning the subject of Community Medicine	31 (50.8)	23 (37.7)	6 (9.8)	1 (1.6)	-	82.2
Camp empowered us to become a rural doctor	26 (42.6)	23 (37.7)	8 (13.1)	2 (3.3)	2 (3.3)	78.8
It has empowered us to diagnose health problems with minimal recourses	17 (27.9)	28 (45.9)	13 (21.3)	2 (3.3)	1 (1.6)	76.5

The discussions with the students during force field analysis established an understanding about the factors students perceived fostered and hindered learning. The main perceived factors helping students to learn was their exposure visit to the Primary health centre, Sub-centre and Anganwadi centre (94.7%) (see Note 1), which was an opportunity for them to directly interact and learn from Auxiliary Nurse Midwife and Anganwadi worker (68.4%) (see Note 2). The other positive factors were facilitation of a workshop on Problem-Solving for Better Health (PSBH) (63.2%), interactive sessions of short duration (57.9%) and their participation in a field-based cluster survey on immunization coverage and an exercise on focus group discussion (52.6%). The main factors perceived to work against learning were the fewer interactive sessions within the knowledge-based theory teaching and the statistics used in these sessions (57.8%), the use of lengthy PowerPoint presentations in the lecture sessions (42.1%), and the overly-busy schedule (36.8%). The other problem students noted was that there was too little time given to Epi_info™ software

learning and Integrated Management of Neonatal and Childhood Illness (IMNCI) workshop, interaction with the health care providers and lecture sessions after dinner (31.6%). The lack of interest of facilitators and patients in the field clinics was also perceived to negatively affect students' learning (26.3%). (Table II).

Table II: Force field analysis with 19 students to explore perceived forces for and against learning

Forces for learning	n (%)	Forces against learning	n (%)
Exposure visit to Primary health centre, Sub-centre and *Anganwadi* centre was useful for our learning	18 (94.7)	Less interactive sessions with lot of theory and statistics in it	11 (57.9)
Interaction with health workers such as *Anganwadi* worker, Accredited Social Health Activist (female village level health worker) and Medical officer was useful	13 (68.4)	Use of lengthy PowerPoint presentations in the lecture session	8 (42.1)
Problem Solving for Better Health workshop during the camp period	12 (63.2)	Very busy time table (schedule)	7 (36.8)
Interactive lectures of short durations	11 (57.9)	Lecture sessions after dinner	6 (31.6)
Field-based survey or demonstration of Focus group discussion	10 (52.6)	Less time for Epi_info™ or Integrated Management of Neonatal and Childhood Illnesses workshop or interaction with health care providers	6 (31.6)
Opportunity to deliver health education in a school	8 (42.1)	Poor facilitation in field clinics	5 (26.3)
Field-based clinics	6 (31.6)	Poor co-operation of patients in field clinics	2 (10.5)
Teaching National Health Programs with interaction of experts, field visits and innovative teaching methods	4 (21)	Less duration of camp	3 (15.8)
Stay in field settings	3 (15.8)	Sitting on ground for too long time during sessions in the field	3 (15.8)
Integrated teaching approach	2 (10.5)	Personal illness during the camp period	1 (5.3)

Discussion

ROME camp is a student-centered program for skill building in public and clinical disciplines for final-year medical undergraduates. It was noteworthy that students were generally very positive about the camp and its component parts. The ROME camp is similar to Community-oriented Medical Education (COME), in that both are educational processes that focus on population groups and individuals in the community and take into consideration the community's health needs[11]. Adoption of community orientation in medical education has potential benefits for students, medical schools, and also for the community[12].

The Re-orientation of Medical Education (ROME) program of the World Health Organization was aimed at developing medical doctors for the rural poor through changes in students' curriculum[13]. A study of 44 Indian medical colleges undertaken by the Indian National Institute of Health and Family Welfare (NIHFW) during 1988-89 revealed that, regrettably, the goals of the Health For All initiative were forgotten in curriculum planning[14]. The goals of 'Health for All by the year 2000' were related to maternal and child health, safe drinking water and sanitation and indicated a need for skilled medical officers at Primary Health Centre level[15]. The curriculum of the MGIMS ROME camp has been responsive to these goals and the corresponding learning needs of medical students. However, perceived needs in medical education change with time, and there is now a growing need to emphasize public health principles within medical education due to the globalization of economies, the emergence of new infectious diseases, the ageing of the population and growing numbers with chronic conditions, and the increasing violence and terrorism. These topics should be taught to medical students to ensure they understand the complex social and economic determinants of health[16]. While

the Department of Community Medicine, MGIMS, Sewagram has made significant progress in developing a relevant and updated curriculum for the ROME camp, it now also needs to focus on emerging public health issues using new learner-based teaching approaches like problem-based learning and the use of learning portfolios.

The overall teaching approach in the MGIMS ROME camps is an integration of task-oriented assignments, social sciences within the medical domain and active community involvement. In a formative exploration of the teaching of Community Medicine in MGIMS, Sewagram, students' perceived the camp-based teaching to be an effective teaching approach for the subject of Community Medicine[17]. In South East Asia and specially in India, there has been an increase in the number of medical schools implementing a community-based education (CBE) program[18]. Most medical schools experience difficulties providing the right quality and quantity of educational experiences due to lack of curricula to respond to the needs of the community and the country. The present study explored the curriculum of the ROME camp, and its findings might help those who are involved in development of CBE programs elsewhere.

Overall, there was good consensus that the various aspects of the ROME camp curriculum were valuable to learning. However, there was poor consensus for some less interactive theory sessions and the utility of the field-based clinics due to poor facilitation and lack of cooperation from the patients. Major perceived constraints affecting student learning were the relative lack of interaction between students and teachers in some sessions, which instead were heavy on information and statistics, and the use of lengthy PowerPoint presentations in some theory classes. The findings of a force field analysis of students' perceived strengths and weaknesses of the camp were used to create a set of recommendations. We concluded that the MGIMS should adopt active learning methods (tutorial, self-directed and independent) in the ROME camp. The operational link between the camp curriculum and the subsequent stage of practice, i.e., primary health care and village level health care providers, should be retained and strengthened. There should be a policy addressing the evaluation and effective use of communication technology in the educational program. These recommendations are in line with those of the "Edinburgh Declaration" of World Federation for Medical Education (WFME)[6] Hence, the teaching faculty of the ROME camp should be well-informed about trends and innovations in public health teaching and should emphasize and encourage student-teacher interaction.

To conclude, the major strength of the camp, as perceived by its current students, has been its exposure visits and hands-on experiences in surveys and interaction with health providers within villages. One perceived major weakness was poor student-teacher interaction in some sessions, including field-based clinics and theory classes on national health programs. Hence, the ROME camp curriculum should be amended to emphasize interactive theory sessions to better bridge the theory and practical sessions. We believe the ROME scheme can be revitalized in all medical colleges in India with some contextual modifications for local circumstances as an effective and practical approach to public health teaching for medical students.

Acknowledgements: We are thankful to Ralf R Graves, Program Manager Regional Institutes; Foundation for Advancement of International Medical Education and Research (FAIMER), Philadelphia for her kind support. We also acknowledge FAIMER fellows Dr. Komala Devi and Dr. Y S Sivan at PSG- FAIMER Regional Centre, Coimbatore, India for their help.

Note 1: Anganwadi (the word means "courtyard shelter" in Hindi) are government sponsored child-care and mother-care centres which were started by the Indian government in 1975 as part of the Integrated Child Development Services Scheme to combat child hunger and malnutrition through supplementary nutrition, and early childhood development through informal education.

Note 2: Anganwadi worker is a female worker chosen from the community. She has to ensure key maternal and child services like supplementary nutrition, micro-nutrient supplementation, immunization, periodic health check-ups and referral, and nutrition education of mothers.

References

1. Garg BS, Zodpey S. *Status paper on public health courses in India*. World Health Organization Country Office- India. New Delhi; 2006.

2. Government of India. *Compilation on 50 years of Indian Education: 1947-1997* [Internet] 1997 [cited 2009 May 18]; Available from: http://www.education.nic.in/cd50years/15/8P/84/8P840B01.htm

3. Medical Council of India. *Salient features of regulations on graduate medical education.* [Internet] 1997 [cited on 2009 May 18]; Available from: http://www.mciindia.org/know/rules/rules_mbbs.htm

4. Medical education: Seven Innovations. Mahatma Gandhi Institute of Medical Sciences. [Internet] [cited on 2010 March 19]; Available from: http://www.mgims.ac.in/

5. Garg BS, Nayar S. Doctors for the rural poor. *World Health Forum.* 1996; 17:268-270.

6. World Federation for Medical Education. The Edinburgh Declaration. *Medical Education.* 1988; 22:481-482.

7. Training in Participation Series [PRA tips on CD-ROM]. Patna (India): Institute for Participatory Practices; 2004.

8. 5-point vs. 6-point Likert Scales. [Internet] [cited 2009 May 12]; Available from: www.infosurv.com/images/Likert_Scale_Debate.pdf

9. Tastle WJ, Russell j, Wierman MJ. *A new measure to analyze student performance using the Likert scale.* 2005 [Internet] [cited 2009 Mar. 7]; Available from: www.isedj.org/isecon/2005/2142/ISECON.2005.Tastle.pdf

10. Hsieh HF, Shannon SE. Three approaches to qualitative content analysis. *Qualitative Health Research.* 2005; 15(9):1277-1288.

11. World Health Organization. *Community-based education of health personnel: Report of a WHO Study Group.* Geneva: World Health Organization, 1987.

12. Habbick BF, Leeder SR. Orienting medical education to community need: a review. *Medical Education.* 1996; 30:163-171.

13. World Health Organization. *Reorientation of Medical Education: Goal, Strategies and Targets* (No. 2). SEARO Regional Publications No. 18. New Delhi: World Health Organization, Regional Office for South-East Asia, 1988.

14. Durgawale PM, Durgawale PP. Medical education: our current concerns. *Indian Journal of Community Medicine*. 2006; 31(3):121.

15. Hall JJ, Taylor R. Health for all beyond 2000: the demise of the Alma-Ata Declaration and primary health care in developing countries. *The Medical Journal of Australia*. 2003; 178 (1): 17-20. [cited 2010 April 2]. Available from: http://www.mja.com.au/public/issues/178_01_060103/hal10723_fm.html

16. Patrick WK, Cadman EC. Changing emphases in public health and medical education in health care reform. *Asia-Pacific Journal of Public Health.* 2002; 14(1):35-39.

17. Dongre AR, Deshmukh PR, Garg BS. Formative exploration of students' perception about Community Medicine teaching at Mahatma Gandhi Institute of Medical Sciences, Sewagram, India. Online Journal of Health and Allied Sciences. 2008; 7(3):2. [cited 2010 March 22] Available from: http://openmed.nic.in/3183/01/2008-3-2.pdf

18. Kristina TN, Majoor GD, Van der Vleuten CP. Comparison of outcomes of a community-based education programme executed with and without active community involvement. *Medical Education*. 2006; 40(8):798-806.

Critical appraisal of a community-based medical training program

Annexure 1M

Gupta SS, Dongre A, Garg BS; MGIMS, Sewagram; Wardha

Mahatma Gandhi Institute of Medical Sciences, Sewagram:

An experiment in medical education to produce doctors with a rural bias

Community-based training at Sewagram

- Rural Placement *(Prior to Post-graduation)*
- Internship Training *(Internship)*
- Re-orientation of Medical Education Camp *(Final year)*
- Social Service Camp and Village adoption scheme *(3 months after admission)*
- Orientation Camp *(On admission)*

Social Service Camp

- Each year, the Institute adopts one village for a batch of medical students. Each student adopts 3-4 families and the entire village population is covered.
- 15-days residential camp followed by once a month visit to adopted families for the next three years. Students look after the health needs of their allotted families during follow-up visits
- Students learn about rural life, environmental sanitation, socio-economic conditions and health problems of the community

Objective of the study

- To do evaluation of community-based medical training program at MGIMS, Sewagram and use the findings for improvement of the program and for its replication

What was done?

- Expected outcomes from the community-based teaching program identified as
  - Attitude towards working in rural areas;
  - Attitude towards acquiring communication skills.

  Likert scales were used to measure attitudes before and after the camp.

- The perception of undergraduate students about the camp was collected using three qualitative methods
  - Focus group discussion
  - Venn diagram
  - Free listing and pile sorting

  Triangulation of different qualitative methods was done to find out the consistency of findings.

Results

Assessment of attitude

- **The mean score on Likert scale for 'working in rural area' (30-items)**
  - Before the camp - 3.7 + 0.4
  - After the camp - 3.9 + 0.4

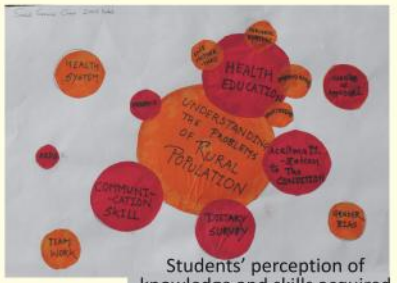
  This difference was significant statistically ($p<0.01$)
- **The mean score Likert scale for 'learning communication skills' (18-item)**
  - Before the camp - 4.1 + 0.3
  - After the camp - 4.2 + 0.4

  This difference was not significant

Focus Group Discussion

- **Camp helped the students learn**
  - The village life
  - Health problems and health seeking behaviors of villagers
  - Reasons for the particular health seeking behavior
  - Accessibility to health services
  - Communication skills
- **The following teaching approaches during the camp were appreciated by the students**
  - Family visits
  - Tips by teachers were extremely helpful
  - Discussion with the teachers
  - Role play
- **Students suggested the following for improvement of the camp:**
  - More time with the families
  - Better services for the families

Venn diagram



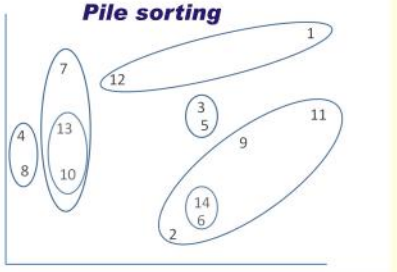
Students' perception of knowledge and skills acquired

Free listing

Factors which helped students build a positive attitude towards 'working in rural areas'

Factors	Smith's
Convincing families to get their investigations done	0.43
Family visits	0.39
Group discussion with teachers	0.25
Villagers' affection for students	0.24
Students' own rural background	0.19
Journal exercises	0.18
Role play on communication skills	0.18
Hands on experience	0.17
Communication with the villagers	0.16
Lecture	0.12

Pile sorting



1 – Villagers' affection for students
2 – Convincing families to get their investigations done
3 – Family visits
4 – Stories
5 – Field exposure
6 – Diet survey
7 – Role plays on communication skills
8 – Teachers' life
9 – Hands on experience
10 – Lectures
11 – Own rural background
12 – Communication skills
13 – Group discussion
14 – Journal exercises

Future Plan

- Sharing of the findings of the evaluation with all the stakeholders
- To sustain the strong components which help fulfill the objectives of the camp
- To strengthen the weaker components
  - Journal exercises (Decision to edit the journal has been taken by the department. The investigator has been given this responsibility)
  - Continue and further strengthen training on communication skills
- Evaluation to be made a regular feature of social service camp

Annexure 1N

Student and faculty preparedness for e-learning in a rural medical college in central India

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Mahatma Gandhi Institute of Medical Sciences, Sewagram, India

Context

- Information technology has potential to transform higher education, as it has done with many other sectors and systems in society.
- Universities in developed countries are harnessing the power of information technology for enhancing students' learning experiences. However, progress in developing countries is slow.
- MGIMS, Sewagram, a medical college in central India, has decided to include e- learning in its curriculum.
- Medical Education Unit has initiated formative research to facilitate decision-making for e-learning.

Objective

- To assess student and faculty preparedness for E-learning

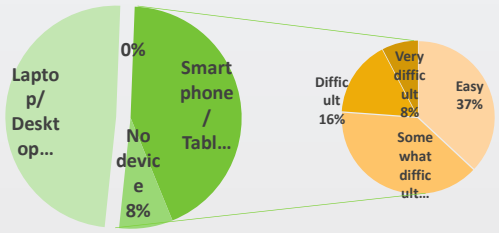
Methodology

- Four batches of medical students (N = 268) were surveyed for
  - access to computing devices,
  - ease of purchasing a computer,
  - confidence in own computing skills, and
  - first reactions to the launch of e-learning platform.
- Three focus group discussions were held with students from different batches
- In-depth interviews of 15 teachers were conducted to understand their perspectives
- Three brainstorming sessions with faculty members during E-learning training

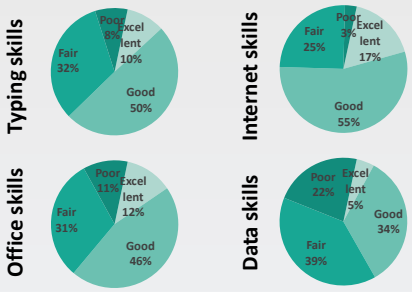
Results (Quantitative)

Findings based on survey of 268 students (81%) from four batches (2012 – 2015).

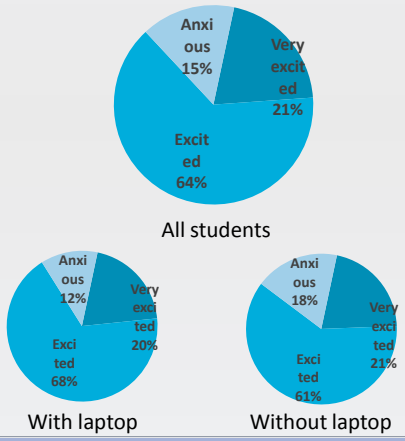
Access to a computing device



Computing skills



First reactions



Results (Qualitative)

	Reasons for excitement	Reasons for apprehensions
Students	Provision of learning anywhere anytime & better access to resources	Concerns regarding infrastructure, concerns for poor students
	Facilitation of collaborative learning; Teachers availability to answer queries	Sustainability of the current initiative and uniformity in quality of courses
	Better access to learning resources	Keeping students motivated
	Diversity of method will make learning interesting and easy	Will e-learning demand more time from students
Faculty	Will help improve outcomes in all domains of learning	Attendance of students in classes may decline
	Will help overall development of students including life-long learning	Teachers' skills and motivation for developing quality courses
	Help students learn at their own pace	Will be useful only if quality of courses are maintained
	A factor of novelty, keeping pace with the contemporary world	Concerns about time required for developing a quality e-learning course

Summary

- Full support from authorities
- Faculty members and students are excited with the idea
- Faculty members want e-learning core team to prepare model e-courses to motivate other faculty.
- Mechanism of quality assurance required
- Stakeholders emphasized on involving students in all phases

Annexure 1O

Personal and professional development of medical students at MGIMS, Sewagram: enhanced opportunities through curriculum innovations

Subodh S Gupta, Abhishek V Raut, Anshu, Anupama Gupta, BS Garg;
MGIMS MEU group on personal & professional development
Mahatma Gandhi Institute of Medical Sciences, Sewagram; India

Rationale

- The curriculum in most medical schools is heavily tilted towards acquisition of scientific knowledge.
- Though the importance of personal and professional skills is acknowledged world-wide, no clear guidelines available on how to develop these skills among students

Context

- MGIMS, Sewagram was designed as a model to create a rural bias among medical students.
- The institute has initiated several innovations to sensitize students to rural health care.
- The institute collaborates with the government health system through its rural and urban health centres.

Objectives

- To find out students' perception about settings at MGIMS where personal and professional skills were being imparted;
- To identify further opportunities to enhance training in personal and professional skills

Methodology

- Personal and professional skills necessary for medical students were listed after literature review.
- Medical teachers were invited to identify major themes and skills within each theme.
- Two groups of final year medical students (n=22) and interns (n=16) were invited to discuss the current settings in existing curriculum and further opportunities for developing personal and professional skills.

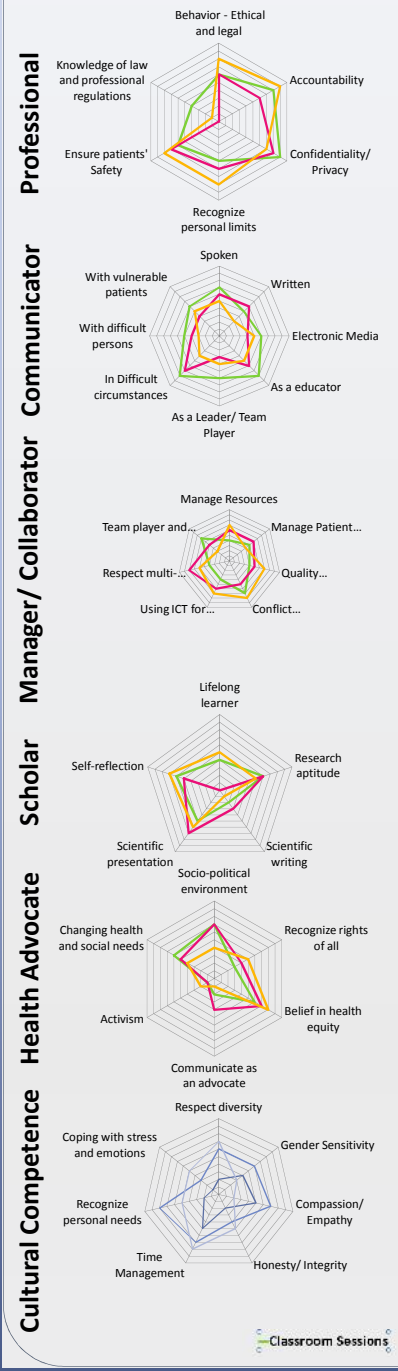
Main outcomes and results

Average score for skills within major 'Personal and Professional Development' areas

Personal & Professional Development domains	Average score
Professional	6.5
Communicator	6.5
Manager/ Collaborator	4.4
Scholar	6.0
Health advocate	4.8
Cultural competence/ Personal development	4.6

Results

Current settings for personal and Professional Skills



	Foundation Course	Community-based Education	Mentoring	Internship	Students' Research	Academy (basic health sciences	Additional Opportunities
Ethical and legal behaviour				√	√		Classes in Forensic Medicine & Community Medicine
Accountability	√√			√			Relationships with teachers, friends, Day to day life
Confidentiality & patients' rights		√		√			Classes in Forensic Medicine Social interactions
Recognize personal/ professional limits			√				Social Interactions
Ensure patient safety				√			**Bed-side clinics**
Knowledge of law and professional regulation							Classes in Forensic Medicine
Communicate effectively as a health educator	√	√√√		√			Observing teachers counselling; Anganwadi workers; **Internship**
as a leader/ team player				√			Group activities; College events; Observing teachers
in difficult circumstances		√√		√			Classes in Psychiatry, Medicine, Community Medicine; Observation
Spoken communication		√				√	Communication workshops; Social interaction;
Written Communication					√√		Essay competition
Electronic communication							
Manage resources		√√		√			Hostel life
Manage patient records/ data		√√		√	√		
Quality improvement		√		√			Workshops, CMEs; Bedside Clinics; Hostel life
Using ICT for better management		√		√	√		College wifi; Library; HIS; Seminars
Respect multi-professional team		√√		√			**Bed-side clinics;** Observing seniors & teachers
Lifelong learner and use evidence for patient care		√					Bed-side clinics
Research aptitude		√√√			√√		
Scientific writing		√√			√√		
Self-reflection		√					**Bed-side clinics**
Awareness of Socio-political environment for health	√	√√		√			**Bed-side clinics; Teachers as role models**
Recognize the rights and equal value of all people	√	√√		√			**Teachers as role models**
Belief in health equity	√	√√		√			**From news, media Teachers as role models**
Communicate effectively – as an advocate		√					Observing teachers, seniors and colleagues
Stand for rights of others		√					
Changing health & social needs and context		√√					Lectures, From media & internet
Respect diversity	√√	√√√		√			**Bed-side clinics**
Gender sensitivity		√√√					Lectures in Forensic Medicine **Bed-side clinics,** Hostel life
Compassion/ empathy	√√	√√√	√				Teacher-student Relationship, Hostel life,
Honesty/ integrity	√√						Organization of events, Observing teachers
Recognize personal needs	√						
Coping with stress and emotions	√						Observing teachers, seniors and colleagues

- Foundation course, Community-based Education, Mentoring program and other curriculum innovations provided a good setting for personal and professional development of the students
- The students recognize importance of hidden curriculum in personal and professional skills development.
- Suggestions from students included - further strengthening of mentorship program, dedicated workshops, more exposure to health care delivery system, guidance on coping with emotions and stress.

List of MGIMS faculty who served as expert consultants in reviewing or updating curriculum at state or national level between 2011-2016

Name of Faculty	Organization which invited as Expert	Curriculum Involved	Year
Dr BS Garg	MCI	Public Health Competencies of the Bachelor of Rural Health Care (BRHC) Course	2012
Dr BS Garg	MCI	MBBS- Community Medicine- Competency based curriculum	2014
Dr BS Garg	MCI	BSc (Community Health) Course	2012
Dr BS Garg	WHO	Developing guidelines to improve teaching of public health in undergraduate medical schools in south east Asia	2010-11
Dr BS Garg	MCI	Expert, Committee to redraft the UG curricula in various specialties to the Competency pattern.	2013
Dr S Chhabra	National Board of Examinations	DNB- Obstetrics and Gynecology	
Dr Nitin Gangane	MUHS Nashik	MBBS- Pathology, design of Competency based curriculum	2013-14
Dr Nitin Gangane	MUHS Nashik	MD Pathology, design of Competency based curriculum	2013-14
Dr Nitin Gangane	MUHS Nashik	Designing of BPMT Course curriculum	2012-13
Dr AM Mehendale	MUHS Nashik	Member, Committee for designing curriculum for the training of Homeopathic doctors in medical colleges in Maharashtra	2015-16
Dr AM Mehendale	MUHS Nashik	Member, MUHS Committee for 'Village Adoption Scheme' of MUHS Nashik	2015-16
Dr AM Mehendale	MUHS Nashik	Member, MUHS Review Committee for Clinical Posting during MD Community Medicine Course	2015-16
Dr BH Tirpude	MUHS Nashik	Member, Development of Curriculum & Examination pattern of BPMT, Forensic Med course (2nd & 3rd year),	2015-16
Dr Anshu	MCI	Expert (Pathology), Executive Committee for planning of integrated curriculum for MBBS	2011
Dr Anshu	MCI	Member, National Subcommittee, Curriculum Implementation Support Programme, Development	2011-12
Dr Anshu	MUHS Nashik	Expert (Medical Education)- MBBS- Pathology- Competency based curriculum	2013
Dr Anshu	Obama-Singh 21st Century Knowledge Initiative: MUHS	Designing curriculum for Masters in Health Professions Education	2012-15

	Nashik and University of Michigan Medical School, USA		
Dr Anshu	WFME, CenMEDIC UK, FAIMER and Keele University UK	Designed modules for distance based course for Masters in Health Professions Education	2010-14
Dr Anshu	Dept of Epidemiology, National Institute of Health and Family Welfare, New Delhi	Designed modules for Postgraduate Diploma in Applied Epidemiology	2012
Dr Subodh S Gupta	Dept of Epidemiology, National Institute of Health and Family Welfare, New Delhi	Designed modules for Postgraduate Diploma in Applied Epidemiology	2012
Dr Smita Singh	MCI	MBBS- Ophthalmology	2013-14
Dr Subodh S Gupta	IGNOU	Member, Expert Committee, Bridge Course on Community Health Nursing	2016
Dr Indrajeet Khandekar	MCI	MBBS- Forensic Medicine	2014
Dr Pravin Khairkar	Post graduate training Task Force of Indian Psychiatric Society and MCI	Expert, Psychiatry, Postgraduate Education and Training	2012
Dr Dilip Gupta	MUHS Nashik	MBBS-Surgery- Competency based curriculum. Invited as Member, Board of Studies	2014-15
Dr Dilip Gupta	MUHS Nashik	Designed a module for Fellowship in Rural Surgery	2011
Dr R Narang	MUHS Nashik	Designed a module for Fellowship in Rural Surgery	2011
Dr PR Deshmukh	MUHS Nashik	Member, Curriculum Development Committee, Advanced Course on Research Methodology	2014
Dr MVR Reddy	MUHS Nashik	MBBS- Biochemistry- Competency based curriculum	2014-16
Dr Satish Kumar	MUHS Nashik	MBBS- Biochemistry- Competency based curriculum	2014-16

Best Practices at MGIMS Sevagram:
Clinical Forensic Medicine Unit (CFMU)

1. Title of the Practice

Clinical Forensic Medicine Unit (CFMU) at Accident & Emergency Centre/ Casualty under Department of Forensic Medicine

2. Objectives of the Practice

- To improve the quality of medico-legal work of our hospital and to assist in proper disbursement of justice.
- To involve faculty members in handling clinical forensic work so that they can impart practical medico-legal skills to undergraduate and postgraduate students more effectively
- To involve postgraduate trainees in Forensic Medicine in actual handling of clinical forensic work.
- To relieve clinicians and radiologists from attending the court calls, giving evidence in court, preparing medico-legal reports, weapon reports etc.

3. The Context

Clinicians are often inadequately trained to deal with medicolegal issues and are not well equipped to handle judicial procedures. Previously postgraduates passed MD Forensic Medicine exam without even handling a single forensic case. As per MCI and MUHS regulations in Forensic Medicine, postgraduate trainees must be involved in actual handling of clinical forensic services; and to fulfill this mandate, the CFMU was created under the Department of Forensic Medicine.

To improve the quality of clinical forensic services we needed to modify the old formats that were being used since decades. We needed a separate space for postgraduates and faculty members to conduct medico-legal examination of all types of patients including sexual assault cases, preparation of medico-legal documents, weapon reports, final reports and also space for proper preservation of forensic samples till its handover to police.

4. The Practice

Since August 2012, separate space was provided to the CFMU in the Accident and Emergency Centre. MGIMS became the only institute in the country where the Department of Forensic Medicine offers all types of clinical forensic services in the casualty/ Emergency Medicine Department round the clock. The Forensic Medicine consultants collect data form of all patients who seek healthcare in the accident and emergency unit of hospital because of accidents, injuries and trauma, assess victims of sexual assault and also deal with such issues as estimating the age of the patients and determining whether or not the person is alcohol intoxicated

5. Evidence of Success

- Faculty members are getting hands on training in the practical intricacies of clinical forensic work
- PG students in Forensic Medicine are now actually handling clinical forensic work

- As CFMU has relieved the burden of clinical medico-legal work of clinicians we got good support from all the specialties especially Surgery, Orthopedics, ENT, OBGY, radiology and medicine. Clinicians can focus on their clinical work and no longer have to attend courts and cross examinations

6. Problems Encountered and Resources Required

Previously our department of Forensic Medicine use to run only from 9 am to 5 pm. But, now due to CFMU our department runs 24x7. So, problems of time scheduling will be encountered. Adequate manpower is also needed according to workloads to provide round the clock clinical forensic services.

BEST PRACTICES AT MGIMS SEVAGRAM

LOW-COST DRUG INITIATIVE

OBJECTIVES OF THE PRACTICE

The aim of the low-cost drug initiative at MGIMS is to provide appropriate and affordable drugs to our patients.

THE CONTEXT

There are huge differences between the costs of drugs available in the market depending on their brand. The costs of drugs in the market are unreasonably high. Atorvastatin, a cholesterol reducing medication, for instance, sells at the market for Rs 78 per 10 tablets (MRP price printed on the brand-named leader). Similarly, Piperacillin Tazobactam, an antibiotic that doctors choose to treat their seriously ill patients with sepsis costs Rs 450. The market, obviously, keeps the drug for which they getting the highest commission. This results in unaffordability of drugs by poor patients which may in turn force them to opt out of taking the drugs altogether.

THE PRACTICE

This initiative to reduce the cost of drugs to the patient was made possible by first minimizing the ‘supply chain effect’ and then by overcoming the ‘marketing effect’. We did this by using a multi-pronged strategy.

We involved healthcare workers in making a list of essential drugs and surgical items and deleted from the list as many “me too” and irrational drugs as was feasible in our setting. We procured drugs at substantially cheap prices by inviting competitive quotations from drug distributors and used the electronic hospital information system to buy, stock and dispense drugs and surgical items.

We made doctors and public aware of the benefits of the initiative and banned all drug representatives from showcasing their products in the hospital. We encourage our residents to prescribe drugs by their generic names.

Two 24 x 7 pharmacies are opened in the hospital premises to ensure that our registered inpatients and outpatients can access these drugs at affordable prices.

We introduced computerized prescriber order entry (CPOE) to prescribe drugs. We also created e-prescriptions on the iPad app, specially designed for this purpose. The electronic applications help doctors identify drugs by both their generic names, check for their availability in the drug store and display their prices- thus minimizing prescription errors and improving the quality of evidence-based therapies.

EVIDENCE OF SUCCESS

Patients with catastrophic illnesses as well as those with chronic diseases have found significant difference in the cost of medications they buy at MGIMS compared to the market pharmacies. The low-cost drug initiative has substantially reduced the cost of medical treatment at Kasturba hospital, both in outpatient and inpatient setting.

- Atorvastatin, a cholesterol reducing medication, for instance, sells at the medical store for Rs 7.60 per 10 tablets instead of Rs 78, MRP price printed on the brand-named leader.

- Similarly, Piperacillin Tazobactam, an antibiotic that doctors choose to treat their seriously ill patients with sepsis costs Rs 132 as against the market price of Rs 450.

- Ceftriaxone 1 g injection used to treat infections is available in the medical store for Rs 19.20 compared to Rs 48 that popular brands command.

- Patients with coronary heart disease, high-cholesterol levels, high-blood pressure and diabetes can have these four disorders treated with five evidence-based drugs (aspirin 75 mg, atorvastatin 10 mg, enalapril 5 mg, amlodipine 5 mg and metformin 1 g) for Rs 145 per month- less than Rs 5 per day.

During the year 2015, a total of 5,73,295 patients have been benefitted by this low-cost drug initiative. We believe that this initiative has reduced the out of pocket expenditure on drugs and has reduced the healthcare costs.

PROBLEMS ENCOUNTERED AND RESOURCES REQUIRED

The biggest challenge to make this initiative work was to stop the interaction between doctors and medical sales representatives that was harming our patients' economic health. Some doctors clearly felt uncomfortable. However, we actively taught our residents and interns that cheaper brands were available and displayed them in our outpatient clinics and in our wards. Eventually residents developed conditioned reflexes, strong enough to drive away expensive brands from our hospital.

We needed good leadership, an efficient hospital information system and electronic innovations to start this good practice.

BEST PRACTICES AT MGIMS SEVAGRAM

HEALTH INSURANCE SCHEME

OBJECTIVES OF THE PRACTICE

MGIMS Sevagram's unique health insurance scheme creates health consciousness in community by making people responsible for their own health and the health of their community. It gives more strength to the Gram Sabha, makes it accountable for village health and forces it to take decisions for village development. It also provides health care facilities at doorsteps and arranges for hospitalization of those who need it. The scheme avoids charity and creates awareness of human rights.

THE CONTEXT

When people fall ill, accessing health care leads to unexpected expenses. This invariably disturbs the entire budget of the household, more so in people who belong to the low socioeconomic strata of society. This out-of-pocket expenditure is worrisome to underprivileged families who often do not have so much cash in times of emergency. Using the concept of risk pooling, the MGIMS Health Insurance Scheme allow individuals and entire villages to insure their health on an annual basis.

THE PRACTICE

There are two main types of health insurance schemes that are carried out in the hospital – The Health Insurance Scheme and the Jowar Health Assurance Scheme. The main objectives of these two schemes are to create health consciousness in the community.

Health Insurance Scheme: An individual can insure himself and his family by paying Rs 400 a year and in return he gets 50% subsidy in OPD and indoor bills. In the month of December each year, these insurance cards are made and families need to show these cards during registration throughout the next annual year to avail subsidies on all bills.

The Jowar Health Assurance Scheme: Here each participating village is made responsible to pay a payment with the rest of the health expense being covered by the hospital with financial support from the central and state governments. This co-payment (hardly 10% of total amount spent on them) was in the form of a common fund created by the villager by collecting Jowar (sorghum) during the annual December harvest time. Each family in the village contributes based on the size of the individual families land holding. Thus families contribute according to their capacity but receives services according to their needs. The collected harvest is then sold to generate a fund which is then used to provide health assurance for the villagers by strengthening primary care services within the village, and also by subsidizing tertiary level health care for all the participants. This micro-finance health insurance scheme allows individual villages to get the benefit of universal health coverage. For a mere 10% equity it allows these villages to gain access to additional public health resources from the central and state government through Kasturba Hospital who picked up the additional 90% of the health care expenses.

EVIDENCE OF SUCCESS

The health insurance scheme of the institute has won several accolades as it seeks to create health consciousness in the community. This scheme fulfills the very basic tenets of health care delivery.

In 2015-16, a total of 78830 health insurance cards were sold for 302158 members. 18807 families (86199 members) around Sevagram volunteered to obtain health insurance from this hospital. Forty villages were also insured (90210 individuals). The Jowar Health Assurance Scheme has succeeded in creating an environment of active self-participation in health care decision making by the villagers and made it accessible and affordable by linking it to existing governmental resources. In 2015-16, 3561 families which comprised of 16519 individuals were enrolled in this scheme.

PROBLEMS ENCOUNTERED AND RESOURCE REQUIRED

Implementing this scheme requires the trust of the villagers. A sustained interaction with them and community mobilization is important to make this scheme work

BEST PRACTICES

Hospital Information System (HIS) at MGIMS

The Hospital Information System (HIS) at MGIMS is a state-of-the-art, fully integrated hospital information system. The system provides the health workers in the hospital with a full suite of tools for registering patients, ordering tests, retrieving test results and generating electronic discharge summaries.

In 2005, MGIMS introduced HIS in the hospital. It took two years to conceive, design, test and implement this system. Faculty members and the HIS staff teamed with system developers from C-DAC, Noida to design this system that MGIMS is justifiably proud of. The entire project was funded by the Ministry of Information Technology, Government of India.

This system (2 servers, close to 300 desktops) captures, stores and retrieves all data related to half a million outpatients and 50,000 inpatients every year. Most laboratories are paperless now, and residents and consultants are able to access all test results, radiologic images—anytime anywhere. The wireless connectivity of the campus has greatly helped all caregivers access information, real-time. The system has close to 18 modules—all functioning—that capture data from registration, insurance, admission counters, outpatient departments, labs (Pathology, Microbiology, Biochemistry and Radiology), inpatient departments, blood bank, operating rooms, Pharmacy, Kitchen and discharge counter. A Picture Archival and Communication System (PACS) now enables doctors to access the radiology images (radiographs, CT images, MRI images and USG) on their desktops.

The unique addition to the system is the use of iPads at the point of care—now the doctors can access the patient data at the point of care. This application – specially designed and developed for MGIMS- has been introduced for the first time in India- few public or private hospital in the country are using iPads at the point of care. They can peep into the patients' records, review past histories, and generate electronic discharge summaries using this system. The system has minimized human errors, increased the accuracy of data and improved patient outcomes. A poster presentation on the use of Ipads at the point of care won the best paper award in an international conference in South Africa in 2015.

Annexure 1U

No. cc/9812
Office of the Dean
MGIMS, Sewagram
Date: 24/02/2016

Notice

2011 Regular Batch Interns

The Internship Orientation Programme will be held in **S. N. Hall** as per the schedule given below. **It is mandatory for all Interns to attend the programme failing which they will be considered absent during those days.**

Date	*Time*	*Topics*	*Department*
29/02/2016	9.30 AM-1 PM	Introduction	Dr.K.R.Patond
Monday		Internship- Rules & Regulations	Dr. A.M.Mehendale
		Online Registration with	Dr. Chetna Maliye
		Maharashtra Medical Council	Dr. D. Dambhare
	2.30 -5.00PM	Communication skills, Professionalism and ethics in Medical Education	Dr. P Khairkar
01/03/2016	9AM -11AM	Doctor Patient Relationship, Critical Medicine	Medicine
Tuesday			
	11 AM- 1 PM	Rationale Use of Drugs	Pharmacology
	2-3 PM	Disaster Management	Surgery
	3-5 PM	ABC of Polytrauma cases	Surgery & Orthopaedics
02/03/2016	9- 10AM	IMNCI	Dr. Abhishek Raut
Wednesday	10AM-11AM	Epidemiology on Computers	Mr. M. S. Bharambe
	11AM-1PM	Right to Information Act (RTI) and Medical Profession	Dr. Indrajit Khandekar
	2-3 PM	Hospital Waste Management	Dr. P.R. Deshmukh
	3-5 PM	Alternative Health System and Humanity/Yoga	Dr. Ranjan Solanki
03/03/2016	9AM – 11AM	Ethical & Medico Legal Issues	Forensic Medicine
Thursday	11AM – 1PM	HIS	Dr. S P Kalantri
	2-5 PM	Collection of Samples	Microbiology/
		Filling of forms	Pathology/
		Interpretation of results	Biochemistry
04/03/2016	9 – 10AM	Cardiopulmonary- Resuscitation- Procedures (CPR)	Anaesthesia
Friday	10AM-1PM	Workshop on RNTCP	Dr. S Dey
	2-4.00 PM	Essential Obstetric Care	Obstetrics &
	4.00-5.00 PM	PC & PNDT Act	Gynaecology
	5.00PM	Prayer	

24.2.16
Dr. K. R. Patond
Dean

All Notice Boards
Copy to:1)The Medical Superintendent
2) The HOD- Medicine/Surgery/ Obstetrics & Gynaecology /Community Medicine/Pathology/ Orthopaedics/Anaesthesia/Microbiology/Biochemistry/Forensic Medicine/Pharmacology/ Psychiatry.
3) DTO Wardha
4) Dr. Sajal Dey
5) Dr. V. Vyas / Dr. Ruchi Kothari, President/Secretary, Academy of Medical Sciences, to ensure necessary arrangements including refreshments.
6) Dr. A M Mehendale, Officer I/C Internship Training Program.
7) Student section.

Please Note: The concerned Faculty Members are requested to conduct the sessions and send the attendance to HOD Community Medicine on the next day.

No CC/2773
Office of the Dean
MGIMS, Sewagram
Date: 28/07/2016

Notice
2011 Ref Batch Interns

(Reference: CC/2684 dtd. 27/07/2016 Internship Training Programme - 2016 MUHS)
The Internship Orientation Programme will be held as per the schedule given below. **It is mandatory for all interns to attend the programme failing which they will be considered absent during those days.**

Date	*Time*	*Topics*	*Department*
01.08.2016 Monday	9.30 AM-1 PM	Introduction Internship- Rules & Regulations Online Registration with Maharashtra Medical Council	Dr.K.R.Patond Dr. A.M.Mehendale Dr. Chetna Maliye Dr. D. Dambhare
	2.30 -5.00PM	Communication skills, Professionalism and ethics in Medical Education Doctor Patient Relationship.	Dr. P Khairkar Medicine
02.08.2016 Tuesday	9AM -11AM	Critical Medicine	Pharmacology
	11 AM- 1 PM	Rationale Use of Drugs	Surgery
	2-3 PM	Disaster Management	Surgery & Orthopaedics
	3-5 PM	ABC of Polytrauma cases	Dr. Abhishek Raut
03.08.2016 Wednesday	9- 10AM	IMNCI	Mr. M. S. Bharambe
	10AM-11AM	Epidemiology on Computers	Dr. Indrajit Khandekar
	11AM- 1PM	Right to Information Act (RTI) and Medical Profession	Dr. P.R. Deshmukh
	2 -3 PM	Hospital Waste Management	Dr. Ranjan Solanki
	3- 5 PM	Alternative Health System and Humanity/Yoga	
04.08.2016 Thursday	9AM - 11AM	Ethical & Medico Legal Issues	Forensic Medicine Dr. S P Kalantri
	11AM - 1PM	IHS Collection of Samples Filling of forms Interpretation of results	Microbiology/ Pathology/ Biochemistry
05.08.2016 Friday	9 - 10AM	Cardiopulmonary- Resuscitation-Procedures (CPR)	Anaesthesia Dr. A Lanjewar
	10AM -1PM	Workshop on RNTCP	
	2- 3 PM	Essential Obstetric Care	Obstetrics & Gynaecology
	3 - 4 PM	PC & PNDT Act	
	4 - 5 PM	Shramdan	
	5 PM	Prayer	

Dr. K. R. Patond 29.7.16
Dean

All Notice Boards
Copy to:1)The Medical Superintendent
2) The HOD- Medicine/Surgery/ Obstetrics & Gynaecology /Community Medicine/Pathology/ Orthopaedics/Anaesthesia/Microbiology/Biochemistry/Forensic Medicine/Pharmacology/ Psychiatry.
3) DTO Wardha / Dr. A Lanjewar
4) Dr. A M Mehendale, Officer I/C Internship Training Program.
5) Student section.

Please Note: As in this batch with only Eight Interns, the concerned Faculty Members are requested to conduct the sessions in their own Department/ Section and send the attendance to HOD Community Medicine on the next day.

for Prof & Head

Annexure 1V

15 Apr 2013

CIRCULAR

You are all invited to the first session of the integrated teaching session on thyroid.

The program for 17th April in Anatomy Lecture Hall is as under:

Medical management of thyroid disorders (17th April, 2013)

1. **Physiology**: Synthesis, secretion, action and regulation of thyroid hormones- Dr Nishant Bansod (10 minutes-4- 4.10pm)

2. **Biochemistry**: Approach to Thyroid function tests and interpretation-Dr Kumud Harley (15 minutes-4.10-4.25pm)

3. **Community Med**: National program on goiter prevention- Dr Ranjan Solanki (10 minutes-4.25-4.35pm)

Comfort Break of 10 minutes (4.35-4.45pm)

4. **Medicine:** Management of hyperthyroidism, hypothyroidism, thyroiditis- Dr Vishakha Jain (20 minutes-4.45-5.05pm)

5. **Obstetrics and Gynecology**: Hyperthyroidism in pregnancy-Dr Shuchi Jain (10 minutes-5-05-5.15pm)

6. **Pediatrics**: Specifics of hypothyroidism in neonates and children- Dr Akash Bang (10 minutes-5.15-5.25pm)

Dr Anupama Gupta

24 April 2013

CIRCULAR

You are all invited to the second session of the vertical integrated teaching session on thyroid.

Surgical management of Thyroid disorders (Saturday 27th April, 2013) - in Anatomy lecture hall from 12.00 noon to 1.30 PM

1. **Anatomy**: Clinical aspects of development and anatomy of thyroid- Dr Vandana Wankhede (12.00-12.15 PM)

2. **Pathology**: Causes of Thyroid enlargement and Thyroid tumors- Dr Anshu (12.15-12.30 PM)

3. **Surgery**: Clinical examination in thyroid disorders- systemic and local, clinical and radiological signs of metastasis, types of thyroidectomy- Dr Siddharth Rao (12.30- 12.50 PM)

Comfort break of 5 minutes (12.50-12.55 PM)

4. **Ophthalmology**: Thyroid associated ophthalmopathy- Dr Purvasha Narang (12.55-1.05 PM)

5. **ENT:** Thyroid gland and the voice box- Dr Deepika Garg (1.05-1.15 PM)

6. Question answer session (1.15 -1.30PM)

Please reach Anatomy lecture hall 15 minutes before we begin the session.

Dr Anupama Gupta

Annexure W

CC/10053

Office of the Dean,
M.G. Institute of Medical Sciences,
Sevagram
Date: 02 /03 /2016

Internship Training Programme 2016 (MUHS)
(Reference: CC/ 9812 dated 24/02/2016)

The Maharashtra University of Health Sciences, Nashik in the Final MBBS Part II Examination held in December 2015/January 2016 has declared the following bonafide students of this institute successful.
Their schedule for Compulsory Rotating Internship Training Programme for a period of one year (365 days) is given below:

Internship Orientation Programme – 29/02/2016 to 04/03/2016.

They are posted in the specialties at this institute for the Internship Training Programme as per the schedule given below with effect from 05/03/2016. They are directed to report to this office immediately before reporting to respective department.

NOTE:
They are also directed to submit the Provisional Registration Certificate to this office after online submission with Maharashtra State Medical Council, Mumbai on or before March 29, 2016 positively failing which they will not be allowed to continue their Internship Training at this Institution.

S. No.	Name	Sub Division
Batch – A		
1	Ms. Aditi Sood	AI
2	Mr. Ajay Kumar Shukla	AII
3	Mr. Akhilesh Kumar Tripathi	AIII
4	Mr. Alok Kumar Gupta	AIV
5	Mr. Amarlok Kumar	AI
6	Mr. Anil Kapoor	AII
7	Ms. Annie Horo	AIII
8	Ms. Ansari Lubna Anis Ahmed	AIV
9	Ms. Arifa Ambari Khurshid	AI
Batch – B		
1	Ms. Bhombe Ishwari Dinkar	BI
2	Ms. Bratatee Roy	BII
3	Ms. Brijesha A Patel	BIII
4	Mr. Chavan Abhilash Bansilal	BIV
5	Ms. Dabherao Sheetal Subhashrao	BI
6	Mr. Deepak Yadav	BII
7	Ms. Deotale Snehal Bhaurao	BIII
8	Mr. Dharm Pal	BIV
9	Ms. Ditsha Datta	BI

Dr. Dambhare 4/3/16

Batch – C

1	Mr. Gomashe Ashay Arun**	CI
2	Ms. Hadke Rashmi Naresh	CII
3	Mr. Ingle Mayur Pradeep	CIII
4	Mr. Joshi Shiv Hiren	CIV
5	Mr. Kakde Mrunal Madhukar	CI
6	Ms. Khushbu Choudhary	CII
7	Ms. Khushbu Karoo	CIII
8	Ms. Kolhe Rutuja Sunil	CIV
9	Mr. Lambe Pranay Babarao	CI

Batch – D

1	Mr. Arun Pratap Singh*	DI
2	Ms. Lawhale Samruddhi Sunil	DII
3	Ms. Manognya Bethapudi	DIII
4	Mr. Atit Tiwari*	DIV
5	Mr. Meda Shyamkumar Rajam	DI
6	Ms. Rajak Arti Ramprasad*	DII
7	Mr. Vijay Kumar Singh*	DIII
8	Ms. Menghal Rajlaxmi Rajeev	DIV
9	Ms. Kusum Kushwaha*	DI
10	Ms. Preeti Kumari*	DII
11	Ms. Nagdeve Anagha Ashok	DIII
12	Mr. More Hardik Satyawan	DIV
13	Mr. Naseem Ahmad	DI
14	Mr. Naveen Kumar Gaur	DII

Batch – E

1	Ms. Nazia Hassan	EI
2	Mr. Nitin Kumar	EII
3	Ms. Patil Bhakti Ravindra	EIII
4	Ms. Pittalwar Prachi Pramodrao	EIV
5	Ms. Poshika Agrawal	EI
6	Ms. Puram Kiran Gurudas	EII
7	Mr. Rajat Sharma	EIII
8	Mr. Ram Kumar Pandey	EIV
9	Ms. Shivani Nimje**	EI

Batch – F

1	Ms. Reena Avkhire	FI
2	Mr. Santosh Kumar Nirala	FII
3	Mr. Saurav Mohan	FIII
4	Ms. Udapurkar Darshana Suhas	FIV
5	Ms. Urmila Phad	FI
6	Ms. Ushma Bimal Vora**	FII
7	Mr. Utkrist Lahoria	FIII
8	Ms. Vidwans Tejas Prasad	FIV
9	Mr. Vishal Prakash Nandeshwar	FI

Internship Posting Schedule

Period	Medicine	Surgery	OB & GY	Community Medicine	Paediatrics & Orthopaedics		ENT, Ophthalmology, Casualty & Elective
05-03-2016 to 03-05-2016	A	B	C	D	EI+ EII	EIII+ EIV	F
04-05-2016 to 02-07-2016	B	C	D	E	FI+ FII	FIII+ FIV	A
03-07-2016 to 31-08-2016	C	D	E	F	AI+ AII	AIII+ AIV	B
01-09-2016 to 30-10-2016	D	E	F	A	B I+ BII	BIII+ B IV	C
31-10-2016 to 29-12-2016	E	F	A	B	C I+ CII	CIII+ C IV	D
30-12-2016 to 27-02-2017	F	A	B	C	DI+ DII	DIII+ D IV	E

Schedule of interns posting for ENT/Ophthalmology/ Casualty & Elective:

Batch F

Period	ENT	Ophthalmology	Casualty	Elective
05-03-2016 to 19-03-2016	F I	F II	F III	FIV
20-03-2016 to 03-04-2016	FII	FI	FIV	FIII
04-04-2016 to 18-04-2016	FIII	F IV	FII	FI
19-04-2016 to 03-05-2016	FIV	FIII	FI	FII

Batch A

Period	ENT	Ophthalmology	Casualty	Elective
04-05-2016 to 18-05-2016	A I	A II	A III	A IV
19-05-2016 to 02-06-2016	A II	A I	A IV	A III
03-06-2016 to 17-06-2016	A III	A IV	A II	A I
18-06-2016 to 02-07-2016	A IV	A III	A I	A II

Batch B

Period	ENT	Ophthalmology	Casualty	Elective
03-07-2016 to 17-07-2016	B I	B II	B III	BIV
18-07-2016 to 01-08-2016	BII	BI	BIV	BIII
02-08-2016 to 16-08-2016	BIII	B IV	BII	BI
17-08-2016 to 31-08-2016	BIV	BIII	BI	BII

Batch C

Period	ENT	Ophthalmology	Casualty	Elective
01-09-2016 to 15-09-2016	C I	C II	C III	CIV
16-09-2016 to 30-09-2016	CII	CI	CIV	CIII
01-10-2016 to 15-10-2016	CIII	C IV	CII	CI
16-10-2016 to 30-10-2016	CIV	CIII	CI	CII

Batch D

Period	ENT	Ophthalmology	Casualty	Elective
31-10-2016 to 14-11-2016	D I	D II	D III	DIV
15-11-2016 to 29-11-2016	DII	DI	DIV	DIII
30-11-2016 to 14-12-2016	DIII	D IV	DII	DI
15-12-2016 to 29-12-2016	DIV	DIII	DI	DII

Batch E

Period	ENT	Ophthalmology	Casualty	Elective
30-12-2016 to 13-01-2017	E I	E II	E III	EIV
14-01-2017 to 28-01-2017	EII	EI	EIV	EIII
29-01-2017 to 12-02-2017	EIII	E IV	EII	EI
13-02-2017 to 27-02-2017	EIV	EIII	EI	EII

All interns will be posted for 15 days in Anaesthesiology by HOD Surgery & for 15 days in Psychiatry by HOD Medicine.
The names of interns & their selection of elective Department will be notified separately by the Dean office.

*** Student has applied for transfer outside the state.**
**** Student has applied for transfer within the state.**

2/3/16

to
Dr. K. R. Patond
Dean

All Notice Boards

Copy To: -
- Medical Superintendent
-HODs Department of Medicine/ Surgery/ Obstetrics & Gynaecology /Paediatrics/ Orthopaedics/ ENT/ Ophthalmology/ Radiology/Pathology / Forensic Medicine/ Skin & VD/ Community Medicine
-Dr. A.M.Mehendale, I/C Internship Training Programme
- Student Section – Dean Office

CC/10053

Office of the Dean,
M.G. Institute of Medical Sciences,
Sevagram
Date:- 02 /03 /2016

Internship Training Programme 2016 (MUHS).
(Reference: CC/ 9812 dated 24/02/2016)

The following will be the arrangements of rotation of interns in the Department of Paeditrics & Orthopaedics:

Internship Posting Schedule

Period	Paeditrics	Orthopaedics
05-03-2016 to 03-04-2016	EI + EII	EIII+EIV
04-04-2016 to 03-05-2016	EIII+EIV	EI + EII
04-05-2016 to 02-06-2016	FI + FII	FIII+FIV
03-06-2016 to 02-07-2016	FIII+FIV	FI + FII
03-07-2016 to 01-08-2016	AI+ AII	AIII+AIV
02-08-2016 to 31-08-2016	AIII+AIV	AI+ AII
01-09-2016 to 30-09-2016	BI+BII	BIII+BIV
01-10-2016 to 30-10-2016	BIII+BIV	BI+BII
31-10-2016 to 29-11-2016	CI+CII	CIII+CIV
30-11-2016 to 29-12-2016	CIII+CIV	CI+CII
30-12-2016 to 28-01-2017	DI+DII	DIII+DIV
29-01-2017 to 27-02-2017	DIII+DIV	DI+DII

for Dr. K. R. Patond
Dean

All Notice Boards

Copy To: -
- Medical Superintendent
-HODs Department of Paediatrics & Orthopaedics
-Dr. A.M.Mehendale, I/C Internship Training Programme
- Student Section - Dean Office

NATIONAL CONFERENCE ON HEALTH PROFESSIONS EDUCATION (NCHPE 2014)

REPORT

The sixth National Conference on Health Professions Education (NCHPE 2014) was organized at MGIMS Sevagram from 24-27 September 2014. Around 300 teachers belonging to different health professions including medicine, dentistry, nursing, physiotherapy and AYUSH specialities participated in these proceedings. Dr Arun Jamkar, Hon'ble Vice Chancellor of the Maharashtra University of Health Sciences was the Chief Guest at the inaugural ceremony. Dr Jamkar emphasized the need for competency based education and the need for medical education to cater to the needs of society. Speaking at the inaugural ceremony, Organizing Secretary, Dr Anshu said that this conference had succeeding in bringing inter-professional collaboration to the forefront. The theme of the conference was "*Socially responsive health professions education: Forging partnerships between academic institutions and the health care delivery system*". Speaking on the conference theme, Organizing Chairperson, Dr BS Garg emphasized the need to make the curricula and training more relevant so that the health professionals produced by medical institutes are competent enough to work in rural areas. He also asked if it was possible to impart training to undergraduates in tertiary care settings without actually exposing them to the community setting.

Conference Theme: Need to forge partnerships between academic institutions and the health care delivery system

Dr Subhash Salunke and Dr Abraham Joseph were the keynote speakers on day 1. They both talked about the disconnect between the health care delivery system and academic institutions and urged the need to build partnerships between them. Dr Subhash Salunke pointed out that we cannot extrapolate health data from small villages and remote areas to the national picture. We not only have to consider these rural areas but also the migrant population in urban slums when we engage in planning for health and education. With commitment and belief, it is possible to bridge the gap between health professionals in academic institutes and the health care givers. Dr Joseph shared his experiences in reforming the medical curriculum at CMC Vellore, and the reasons for success of the model. He said that this is not a new phenomenon and has been around since the Bhore committee made its recommendations. The system has not responded to the recommendations in a desired manner, and while we have a diarrhea of recommendations there is a constipation of action. He said that students need to be taught about the diseases prevalent in the community and there is need to move away from the exam-oriented approach. The points that emerged in the discussion that followed were: presence of loopholes in the present system of rural postings; and the need for all health professions (and not only medical personnel) to be posted in rural areas.

This was followed by an interactive session moderated by Ms Mary Beth Scallen and Dr Anshu using appreciative inquiry. Delegates were asked to share their best experiences of partnerships between health professions education and the health care delivery system. Delegates shared anecdotes,

discussed their experiences and possible solutions to the issues highlighted by the key note speakers. The common themes which emerged during this session were:

- The community is an extraordinary platform which can be used for learning (especially during epidemics and disasters)
- Focus on the end product right from the beginning makes the approach to learning more relevant.
- There is need to teach students all aspects of medicine including professionalism, ethics and socio-political aspects of disease
- There is need for health professionals to speak the language of the community so as to build connections with the people
- Collaboration between different systems of medicine need to be encouraged

Panel discussion: A panel discussion on 'forging partnerships between stakeholders' was moderated by Dr BS Garg on 26th September. Panelists included Dr Kalpana Sunatkari (Taluka Health Officer, Wardha Block), Dr Madhuri Dighekar (PHC Medical Officer, Talegaon), Ms Indu Hulke (Ex-Sarpanch, Pavnar), Mr Vilas Dhabale (President, Kisan Vikas Manch, Anji), Ms Sujata Bhagat (ASHA, Bhidi), Ms Usha Raghatate (ASHA, Salod), Dr Abhishek Raut (Asst Professor, MGIMS). Mr PV Bahulekar acted as interpreter. The MGIMS model of community empowerment was showcased. Speakers said that the community had immense potential which needed to be channelized using medical colleges as catalysts. With commitment from institutes it was possible to build partnerships with the community. Women from self help groups said that with education came economic empowerment which led to improved health indicators. The Kishori Panchayat experience showed that empowering adolescent girls led to improved health of their families.

Field Trip: On 27th September, conference delegates were taken on a field trip to Kasturba Rural Health Training Centre (KHRTC) Anji and Paunar villages to show them the work done by the Department of Community Medicine. KRHTC Anji is one of the rural health training centers of MGIMS situated around 24 Kms from Sevagram. The overriding objectives of KRHTC Anji are 'teaching, training, research and health service delivery'. The delegates interacted with the interns, medical officers at KRHTC and understood their role in achieving the objectives of KRHTC. They also had an opportunity to interact with the members of various community based organizations like *Kisan Vikas Manch* and Women's Self Help Groups. At Paunar, delegates were briefed about the Community Owned Primary Health Care services (*Kiran clinic*) model of MGIMS. They also had an opportunity to interact with frontline health workers (ASHA and anganwadi workers) and understand how MGIMS works in partnership with them to improve health of the community at grass root level by empowering them. Delegates also met Mr Gautam Bajaj at Paunar Ashram who talked to them of Vinoba Bhave's principles of self-reliance and equity. The delegates who decided to visit Kasturba Hospital were shown the unique features such as: low cost and generic drug policy, geriatric clinics, hospital information system, general OPD etc.

Are medical institutes ready for MCI reforms?

On 26th September, Dr Avinash Supe (Dean, Lokmanya Tilak Municipal Medical College, Sion, Mumbai) and Dr Arun Jamkar (Vice Chancellor, Maharashtra University of Medical Sciences-MUHS) conducted an

interactive session where the reforms suggested by the Medical Council of India in its 'Vision 2015' document were highlighted. MCI had the mammoth task of faculty development of around 3 lakh medical teachers in order to implement reforms like: early clinical exposure, foundation course, integrated teaching and skills training. Faculty introspected on the challenges, hurdles, resistance and concerns in implementing these reforms. Delegates shared their success stories and failures. CISP reforms were thought to be doable without too much financial assistance, if institutions displayed will and commitment. It was stated that while students were ready for these reforms, faculty did not display enough commitment due to lack of time from clinical work and failed to take adequate initiatives. Dr Supe said that most reforms in India were expected to have a 'top down' approach, where institutes expected regulatory bodies to enforce changes. However it was important that faculty members initiate innovations in their own departments and institutions without waiting for directives from the top. Teachers need to be role models and transformational leadership was needed. Dr Jamkar talked of how MUHS had started communication skills and basic life support workshops all over Maharashtra. Delegates also displayed concern about how the curriculum was getting overloaded without students getting enough self study time. The need for interdepartmental collaborations, transformational leadership and good role models were suggested as answers to this dilemma.

Growth of Health Professions Education in India

Dr Rita Sood, Professor, Dept of Medicine, AIIMS, New Delhi and President, IAHPE delivered a keynote address on the growth of health professions education in India. The focus of this keynote address was largely on the growth of medical education in the country over the last 25 years.

There has been a massive increase in the number of medical colleges in the country over the last two decades and this growth has been largely driven by that in the private sector. There is an obvious maldistribution of medical colleges vis-a-vis the health manpower needs in different part of the country. Though many curricular initiatives have been undertaken in the country over the last two and a half decades, the implementation at a national level has not been very successful.

The consortium response to reform medical education (1986-1995) using inquiry-driven strategies for innovations in medical education was initiated at AIIMS, New Delhi, in collaboration with Centre for Educational development, University of Illinois, Chicago. The Consortium of four institutes (AIIMS, New Delhi; JIPMER, Pondicherry; CMC, Vellore;& BHU, Varanasi) worked together to conduct health systems research and initiate context evaluation for decision making related to curricular change. Health care needs were identified to reform curricular planning and identify innovations based on outcome. The consortium was expanded and through a series of symposia and workshops, a curricular document was developed for undergraduate MBBS course along with a list of essential skills.

This document was later adopted by an MCI Committee and formed the basis of undergraduate medical regulations 1997. At this point, it was envisaged that to carry out any curricular reforms, faculty development was an essential prerequisite. This document also necessitated the establishment of medical education units in all medical colleges.

In the early 1990s many centres for medical education were established in many medical colleges in the country. These colleges pioneered and initiated curricular innovations e.g. AIIMS, New Delhi; CMC Vellore; JIPMER, Pondicherry; SJMC,Bangalore; KEM Mumbai; JNMC, Belgaum etc and many health science universities etc.

Another curricular initiative undertaken by MCI in 2010-11 took off and resulted in the document, 'Vision-2015', many of whose recommendations are likely to be implemented soon. However, there is a huge gap between the dynamic quantitative growth and the static quality of education and this issue seems to be getting attention of various stakeholders.

The faculty development movement in the country has gained momentum over the last 7-8 years. The first National Conference on Medical Education (NCME 2007) was organized at AIIMS on the theme of 'Faculty Development'. As an outcome of this conference, a 'community of practice' of medical educators was formed. This 'community of practice' of medical educators later expanded in numbers as well as scope to include the other health professions educators. Regular national conferences have been organized, where health professions educators have been sharing the educational innovations and learning from each other. Through regular organized efforts, an Indian Academy for Health Professions Education was launched in the year 2013.

Though faculty development in medical education was initiated as early as 1976 at JIPMER, Pondicherry and later at MAMC, New Delhi with the development of NTTCs (National Teacher Training Colleges), and then in early 1990s through some medical education units mentioned earlier, it gained momentum over the last 7-8 years with the establishment of three FAIMER regional centers and seventeen MCI Regional Centers. With the faculty development initiatives by the Medical Council of India, there has been increasing awareness and demand for the health professions educators programs among the faculty of medical and other health professions education colleges.

Over the years, faculty development in the country with the advanced training programs have also led to the growth of medical and health professions educational research and scholarship and a significant increase in the number of publications in the field.

Faculty development holds the key to implementation of curricular reforms and with increasing interest in educational innovations, a better future for medical and health professions education in the country is not far.

Selection of medical students in India: Do they serve "fitness of purpose"?

On 27th September, a Symposium on medical student selection was organized at the sixth National Conference on Health Professions Education (NCHPE 2014) organized at MGIMS Sevagram. The panelists included Dr Namita Kumar, Postgraduate Dean from UK (moderator of the symposium), Dr Tejinder Singh from Christian Medical College Ludhiana, Dr BV Adkoli from Delhi , Dr Vivek Saoji from Pune, Dr Amrita Kalantri, a postgraduate student and Dr Amit Sinha, an intern from MGIMS Sevagram.

Panelists discussed the problems faced, lacunae in the present system of undergraduate and post graduate medical student selection. All panelists felt that the existing system failed to meet required needs of all stakeholders. Both medical students, Dr Amrita Kalantri and Dr Amit Sinha made an impassioned plea to make the present system more fair, transparent and reliable. They said they were not judged on their merit or the consistency of their work throughout the course. They said that students coming from diverse backgrounds with differing standards of primary schooling could not be judged by the same examination. They also bemoaned the quality of multiple choice questions asked which encouraged rote learning and led students to join coaching classes to pass the exams.

Dr Tejinder Singh said that a 3 hour single examination based on multiple choice questions was not a genuine assessment of a student's worth, and a more longitudinal assessment was required. He stated that while the USMLE exams have a total testing time of 43 hours per student, the NEET only tests for 3 hours. He emphasized that literature shows that 'past performance throughout the course was the best predictor of future performance'. Dr Adkoli said that the present system did not test aptitude of the students for choosing this career. It was suggested that a mix of methods using a multistep examination, which included scholastic performance along with aptitude and multiple mini interviews was perhaps the answer to the selection.

Dr Namita Kumar talked of the UK experience with selection exams and said that one ought to differentiate between selection and assessment. Selection exams must be framed to evaluate the potential of the candidates to perform in future. The unanimous opinion of the house was that "a single step examination using poorly constructed multiple choice questions, cannot and should not decide the future of medical students' careers in this country". Though the numbers of candidates make it difficult, it was necessary to explore other options to make this selection system more fair and transparent.

Need for interprofessional collaboration between different health specialities

On 27th September, a team from JHPIEGO consisting of Dr Bulbul Sood, Dr Suranjeen Prasad Palipamulla, Dr Bhawna Bakshi, Dr Debdatta Parija and Dr Neeta Bhatnagar conducted an interactive session on nursing-midwifery education in India. JHPIEGO's success stories of collaborations between doctors and nursing personnel through five national and ten state nodal centres were shared. The need for capacity building of nursing personnel by conducting training workshops and accreditation of nursing schools was emphasized. Conference delegates lauded the free exchange of thoughts between different health professions, and stressed the need for more such common platforms.

Thematic poster session

104 papers on educational research were submitted to the conference of which 90 had been selected for presentation after rigorous peer review. A unique thematic poster session was conducted, where authors presented their educational projects on teaching-learning innovations, problem based learning, assessment, faculty development, information technology in teaching, programme evaluation, student affairs and community based medical education. Each group of posters was facilitated by a group of faculty who encouraged participants to share their experiences. Drs Chinmay Shah, Smita Singh and

Suresh Chari coordinated the poster session. The official journal of the National Board of Examinations, *Astrocyte*, was bringing out a special edition to publish the abstracts of posters presented at NCHPE 2014.

LIST OF PRECONFERENCE WORKSHOPS ORGANIZED

25th September 2014
Morning: 9.30 a.m. to 1.00 pm
PCW 1: Innovative practices in community oriented medical education
Abraham Joseph, Arvind Kasthuri, Subodh S Gupta, Chetna Maliye
PCW 2: Engage your learners: Promote active and deep learning in your large classes
Mary Beth Scallen, AM Ciraj, Sucheta Dandekar, VB Shivkumar
PCW 3: How to design, implement and assess a competency based curriculum
Nivritti Patil, Rita Sood, Anuj Chawla, Smita Singh
PCW 4: How to appraise faculty performance
Gagandeep Kwatra, Henal Shah, Sonia Jain
PCW 5: Interprofessional Education
Anice George, Gauri Lele, Selvam Ramachandran, Poonam Varma Shivkumar

Afternoon: 2.00 p.m. to 5.30 p.m.
PCW 6: Simulation in medical education
Avinash Supe, Vivek Saoji, R Anand, Benhur Premendran
PCW 7: Workplace based assessment in low resource settings
Jyoti Nath Modi, Mrunal Ketkar, Kalyan Goswami
PCW 8: Curriculum Review and Planning: Towards Transformative Health Professions Education
Thomas Chacko, Nirmala Rege, Animesh Jain, Anupama Gupta
PCW 9: Reflective Practice: Looking back to look forward
Medha Joshi, Henal Shah, Ashwini Appaji, MVR Reddy
PCW 10: How to get your research papers published
Chetna Desai, Dinesh Badyal, Satendra Singh, Anshu