BLDE UNIVERSITY

Ordinance Governing M.B.B.S. Degree Course Curriculum

(Revised Curriculum 2012 Batch onwards)

Phase I : Pre-Clinical Subjects

Published by

B.L.D.E. UNIVERSITY

(Declared as Deemed to be University u/s 3 of UGC act, 1956, vide notification No.F.9-37/2007-U.3 (A) dated 29-2-2008, of the MHRD, Government of India)

The Constituent College

SHRI B. M. PATIL
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B.L.D.E. UNIVERSITY

(Declared vide notification No. F.9-37/2007-U.3 (A) Dated. 29-2-2008 of the MHRD, Government of India under Section 3 of the UGC Act,1956)

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SHRI. B. M. PATIL MEDICAL COLLEGE, HOSPITAL AND RESEARCH CENTRE

BLDEU/REG/GEN/2012-13/ 845 September 20, 2012

NOTIFICATION

Sub: Revised Curriculum for the MBBS Degree – 2012

Ref: 1. Medical Council of India Regulation on Graduate Medical Education, 1997 and subsequent amendments of the same from time-to-time.
2. Minutes of the meeting of the Academic Council of the University held on April 11, 2012.
3. Minutes of the meeting of the BOM of the University held on May 23, 2012.

The Board of the Management of University is pleased to approve the curriculum for MBBS Degree course at its meeting held on May 23, 2012.

The revised curriculum shall be effective from the Academic Session 2012-13 onwards, for MBBS degree course in the constituent College of the University viz Shri. B. M. Patil Medical College Hospital and Research Centre from the academic session 2012-13 onwards.

REGISTRAR
REGISTRAR.
BLDE University, Bijapur.

To,
The Dean, FoM & Principal
BLDE University's
Shri. B. M. Patil Medical College, Hospital and Research Centre,
BIJAPUR.

Copy to:
1. Secretary UGC New Delhi.
2. Controller of Examinations, BLDE University, Bijapur.
3. Prof. & HOD's Pre Para & Clinical departments.
4. PS to Hon'ble President, BLDE University.
5. PS to Hon'ble Vice Chancellor, BLDE University.
6. Office Copy

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BLDE UNIVERSITY

Vision and Mission

- *Committed to provide globally competitive quality medical education.*
- *To provide the best health care facilities in this backward region, in particular, to socially disadvantaged sections of the society.*
- *Constantly striving to become a reputed research University with world-class infrastructure, latest tech-tools for teaching/research and adopting global best practices.*

Objectives

- To provide for instruction and training in such branches of learning as it may deem fit.
- To provide for research and for the advancement of and dissemination of knowledge.
- To undertake extramural studies, extension programmes and field outreach activities to contribute to the development of society.
- To do all such other acts and things as may be necessary or desirable to further the objects of the Institute.
- To provide education in medical and health sciences or any other branches that will imbibe humane qualities in our students in order to enable them to practice medical and health care prudently and equitably.
- To endeavor to improve quality of undergraduate and postgraduate education by providing necessary infrastructure and learning resources required.
- To encourage use of learner oriented methods that would cultivate logical thinking, clarity of expression, independence of judgment, scientific habits, problem solving abilities, self initiated self directed and life learning.
- To encourage innovations in education, teaching methods, student assessment and in extension service.
- To provide educational experience that allow hands-on- experience both in institutional as well as in community setting.
- To encourage development of scientific temper, acquire educational experience for proficiency in profession and promote healthy living.
- To constantly display sensitivity and respond to changing educational, social, and community needs.

- To enable students to become exemplary citizens by observation of moral and ethical code of conduct and fulfilling social and professional needs as to respond to national aspirations.
- To plan and implement transparency and accountability in governance of academic and administrative activities.
- To promote staff student welfare programmes.
- To promote public private partnership in various fields including health care.
- To provide for interaction in training and research programs with concerned National or International institutes such as University / Board / R & D Organizations / Centers of excellence such as ICMR, AIIMS, NIMHANS, etc.,
- To introduce the short-term courses for award of PG Diploma and certificates in the University.
- To evolve distance education programs or modularly designed programs leading to degrees that can be awarded on a credit-accumulation basis in the Deemed University system.
- To create an academic and administrative structure in tune with the changing needs of the society, so as to enable the growth of each institution of the University into a center of excellence.
- To promote and sustain international collaborations with institutions, including twinning programs and award of degrees/diplomas.
- To bring in all aspects of creative human activities in medical and allied sciences such as art.
- To organize and promote conferences, seminars, lectures, public debates and exhibitions in matters relating to education.
- To give awards, prizes and scholarships to promote the objectives
- To form centers at convenient places and promote the objectives
- To promote education research, training and professional development in medical, Bio-medical or any other branches of education.
- To collaborate with individuals or universities outside India for the purpose of research, education and extension of knowledge.
- To assist the Government in the formation and implementation of policies relating to health promotion.
- To promote educational activities in habitat related environmental issues such as human waste management, hospital and other medical waste management.
- To promote educational activities in habitat related environmental issues such as pollution, energy and conservation.

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Introduction

The revised M.B.B.S curriculum of The Medical Council of India (MCI) came into effect from May 1997 and it has undergone amendments thereof. The BLDE University has implemented the new regulations for the batches of students admitted to the M.B.B.S course from the academic year 2008-09 and onwards.

University will implement the revised curriculum for the batches of students admitted to the M.B.B.S Course from the academic year 2012-13 onwards.

These regulations recommend the following:

1) That the medical curriculum should be oriented towards educating students to take up the responsibilities of physicians of first contact. The medical graduate should be capable of functioning independently in both urban and rural environment of our country and internationally.

2) Every effort should be made to provide educational experience that allows hands-on-experience both in hospital as well as in community setting. For this purpose, a comprehensive list of clinical skills that a graduate must acquire at the end of the course including internship has been prepared.

3) That maximum effort is made to encourage integrated teaching and every attempt be made to de-emphasize compartmentalization of disciplines so as to achieve horizontal and vertical integration in different phases.

4) That educational experience should emphasise health rather than only disease, and community orientation also instead of only hospital orientation. Population control and family planning should also be given due emphasis.

5) Due importance to be given to teaching common problems of health and disease and to the national programmes.

6) That every effort should be made to use learner oriented methods which would encourage cultivation of logical thinking, clarity of expression, independence of judgment, scientific habits, problem solving abilities, and self-directed learning.

7) Reduction of "didactic lectures (not more than 1/3 of total teaching hours) and increasing use of active methods of learning such as group discussion seminars, role play, field visits, demonstrations, peer interactions etc. which would enable students to develop personality, communication skills and other qualities which are necessary.

8) Examinations be designed with a view to assess not merely the knowledge but also practical and clinical skills, habits and values which are necessary for a graduate to carry out professional day to day work competently.

9) Regular periodic assessment to be done throughout the course for internal assessment. The assessment need not be limited to written tests. It should relate to other items such as maintenance of records, participation in seminars and group discussions, clinical case study, proficiency in carrying out practical or clinical skill or participation in projects and assignments (even) during vacation. These be evaluated objectively and recorded.

10) That every medical institution should evolve institutional objectives, which would be in consonance with the national goals (See Section II) and health policy. The institutional objectives should describe the attributes of their product.

11) Shift in the role of medical teachers from mere imparting knowledge to that of a facilitator and motivator of student learning.

12) That every medical college establishes a medical education unit for faculty development, preparation of learning resource materials and improved evaluation methods.

13) That every medical college should have curriculum committee which would plan curricula and instructional method which would be updated regularly.

With advances in science and technology, integration of ICT in teaching learning process is required and be implemented.

Doctors are confronted with many ethical issues and problems. It is necessary for every doctor to be aware of these problems. The doctors need to be trained to analyze the ethical problems and deal with them in an acceptable manner. It is recommended that teaching of medical ethics be introduced in phase I and continued throughout the course including the internship period.

Awareness regarding history of medicine is necessary to understand the developments. Teaching of History of Medicine to be incorporated in the course.

BLDE University endorses these recommendations and strongly desires to implement them while conducting the MBBS course.

SECTION - I

Objectives of Medical Education

(As stated in MCI Regulations, 1997)

This section contains the goals and general objectives of graduate medical education as stated in MCI Regulations, It is desired that in consonance with these national goals, each medical college should evolve institutional objectives.

(1) NATIONAL GOALS:

At the end of undergraduate programme, the medical student shall endeavour to be able to:

(a) Recognise 'health for all' as a national goal and health right of all citizens and by undergoing training for medical profession fulfill his/her social obligations towards realization of this goal;

(b) Learn every aspect of National policies on health and devote himself/herself to its practical implementation;

(c) Achieve competence in practice of holistic medicine, encompassing primitive, preventive, curative and rehabilitative aspects of common diseases.

(d) Develop scientific temper, acquire educational experience for proficiency in profession and promote healthy living.

(e) Become exemplary citizen by observation of medical ethics and fulfilling social and professional obligations, so as to respond to national aspirations.

(2) INSTITUTIONAL GOALS

The undergraduate students coming out of a medical institution should:

(a) Be competent in diagnosis and management of common health problems of individual and the community, commensurate with his/her position as a member of the health team at the primary, secondary or tertiary levels, using his/her clinical skills based on history, physical examination and relevant investigations;

(b) Be competent to practice preventive, promotive, curative and rehabilitative medicine in respect to the commonly encountered health problems;

(c) Appreciate for different therapeutic modalities, be familiar with the administrations of the "essential drugs" and their common side effects;

(d) Be able to appreciate the social-psychological, cultural, economic and environmental factors affecting health and develop humane attitude towards the discharging one's professional responsibilities.

(e) Possess the attitude for continued self learning and to seek further expertise or to pursue research in any chosen area of medicine, action research and documentation skills.

(f) Be familiar with the basic factors, which are essential for the implementation of the National Health Programs including practical aspects of the following:-

- i) Family Welfare and Maternal and Child Health (MCH)
- ii) Sanitation and water supply,
- iii) Prevention and control of communicable and non-communicable diseases,
- iv) Immunisation,
- v) Health Education;
- vi) IPHS standard of health at various levels of service delivery and medical waste disposal.
- vii) Organizational institutional arrangements

(g) Acquire basic management skill in the area of human resources, materials and resource management related to health care delivery, general and hospital management, principal inventory skills and counseling.

(h) Be able to identify community health problems and learn to work to resolve these by designing, instituting corrective steps and evaluating outcome of such measures.

(i) Be able to work as a leading partner in health care teams and acquire proficiency in communication skills.

(j) Be competent to work in a variety of health care settings.

(k) Have personal characteristics and attitude required for professional life such as personal integrity, sense of responsibility and dependability and ability to relate to or show concern for other individuals.

(l) All efforts must be made to equip the medical graduate to acquire the detailed in Appendix B of Medical Council of India Regulations on Medical Education, 1997.

[Source: GME Regulations amended up to February 2012]

SECTION - II

REGULATIONS GOVERNING M.B.B.S. DEGREE COURSE

(Eligibility for Admission, Duration, Attendance and Scheme of Examination.)

1. ELIGIBILITY

1.1 Qualifying Examination

Student seeking admission to first MBBS course:

i) shall have passed two year Pre University examination conducted by Department of Pre University Education, Karnataka State, with English as one of the subjects and Physics, Chemistry and Biology as optional subjects. The candidate shall have passed subjects of English, Physics, Chemistry and Biology individually.

OR

ii) shall have passed any other examination conducted by Boards / Councils / Intermediate examination established by State Governments / Central Government and recognized as equivalent to two year Pre University examination by the BLDE University / Association of Indian Universities (AIU), with English as one of the subjects and Physics, Chemistry and Biology as optional subjects and the candidate shall have passed subjects of English, Physics, Chemistry and Biology individually.

OR

iii) shall have passed Intermediate examination in Science of an Indian University / Board / council or other recognized examining bodies with Physics, Chemistry and Biology, which shall include a practical test in these subjects and also English as compulsory subject. The candidate shall have passed subjects of English, Physics, Chemistry and Biology individually.

OR

iv) shall have passed first year of the three year degree course of a recognized University with Physics, Chemistry and Biology including a practical test in these subjects provided the examination is an 'University Examination' provided that the candidate shall have passed subjects of English, Physics, Chemistry and Biology individually in the Pre University or other examinations mentioned in the clauses above.

OR

v) shall have passed B.Sc. Examination of an Indian University, provided that he/she has passed the B.Sc. examination with not less than two of the following subjects: Physics, Chemistry, Biology (Botany, Zoology) provided that candidate has passed subjects of English, Physics, Chemistry and Biology individually in the qualifying examinations mentioned in clauses (i) (ii) and (iii).

Note: Candidates who have passed "Physical Science" instead of Physics and Chemistry as two separate subjects are not eligible for admission to MBBS course as per Medical Council of India Regulations vide letter MCI-37(2)/2001/Med.922 dated 14.02.2001

1.2 Marks

The selection of students shall be based on merit provided that:

a) In case of admission on the basis of qualifying examination, a candidate for admission to MBBS course must have passed individually in the subjects of Physics, Chemistry, Biology and English and must have obtained not less than 50% marks for general category,40% for SC,ST and OBC students taken together in Physics, Chemistry and Biology in the qualifying examination

. The minimum marks shall not be less than 45% taken together in Physics, Chemistry and Biology for physically handicapped candidates with lower limb locomotor disability of 40 to 70%.

b) The student shall appear for the competitive entrance examination conducted by the BLDE University, must have come in the merit list prepared as a result of such competitive entrance examination by securing not less than 50% marks for general. category,40% for SC,ST and OBC category students and 45% for candidates with lower limb locomotor disability of 40 to 70%. in Physics, Chemistry and Biology taken together in the competitive examination.

1.3 **Age:** The candidate should have completed 17 years of age on or before 31st day of December of the year of admission.

2. DURATION OF THE COURSE

i) Every student shall undergo a period of certified study extending over $4^1/_2$ Academic years from the date of commencement of this study for the subject comprising the medical curriculum to the date of completion of the examination followed by one year compulsory rotating Internship.

The $4^1/_2$ years course has been divided into three Phases.

1. **Phase – I** – 1 year, consisting of two terms of 6 months each.
2. **Phase – II** - $1^1/_2$ years, consisting of three terms of 6 months each
3. **Phase – III** - 2 years, consisting of 4 terms of 6 months each.

ii) The first year shall be occupied in the study of the Phase - I (Pre Clinical) subject of Human Anatomy (650 hours), Physiology including Bio Physics (480 hours), Bio Chemistry (240 hours) and Introduction to Community Medicine (60 hours). A detailed syllabus is given in later Section.

iii) After passing pre-clinical subjects in Phase – I, the Phase – II shall be 3 terms ($1^1/_2$ years), devoted to Para clinical and Clinical subjects. Para Clinical subjects shall consist of Pathology, Pharmacology, Microbiology, Forensic Medicine including Toxicology and part of Community Medicine. During this phase the clinical subjects shall be taught concurrently. The clinical subjects taught will be Medicine and its allied specialties, Surgery and its allied specialties and Obstetrics and Gynaecology.

iv) Phase – III Part-I consists of Community Medicine, ENT and Ophthalmology.

v) Phase – III Part-II consists of Medicine, Paediatrics, Surgery and their allied specialties, Obstetrics and Gynaecology.

3. ACADEMIC TERMS

All candidates admitted beyond the last date stipulated by the University shall have to appear for I Professional Examination to be held subsequent to the regular examination after completion of the prescribed duration.

4. ATTENDANCE

Every candidate should have attendance not less than 75 % of the total classes conducted in theory, practical and clinical jointly in each calendar year calculated from the date of commencement of the term to the last working day as notified by the University in each of the subjects prescribed to be eligible to appear for the University Examination. (vide Medical Council of India Notification on Graduate Medical Education (Amendment) Regulations 2003, published in the Gazette of India Part III, Section 4, Extraordinary issued on 15th October 2003)

The Principal should notify at the college the attendance details at the end of the each term without fail under intimation to this University.

The candidate lacking in the prescribed attendance and progress in any subject(s) in theory or practical/clinical in the first appearance should not be permitted to appear for the examination in that subject(s).

5. TEACHING HOURS

Phase I

Table I: Distribution of teaching hours in Phase I subjects

Method	Subject/Number of Hours			
	Anatomy	**Physiology**	**Biochemistry**	**Community Medicine**
Lectures	4 hrs per week	160 hrs	120 hrs	40 hrs
Tutorials	1 hr per week	80 hrs	20 hrs	10 hrs
Group Discussion*	1 hrs per week		20 hrs	4hrs
Practical/Demonstration**	2 hrs per week	240 hrs	80 hrs	6 hrs
Dissection	8 hrs per week	---	---	---
Total	**650**	**480**	**240**	**60**

* Includes Seminars, Integrated Teaching ** Includes field visits

SCHEME OF EXAMINATION

6. INTERNAL ASSESSMENT

The internal assessment of the students shall be based on evaluation of assignment, preparation of seminar, clinical presentation etc., (see Annex – 1).

Regular periodic examinations should be conducted throughout the course. There should be a minimum of three (3) sessional examinations during Phase – I of the course and average of best two examination marks should be taken into consideration while calculating the assessment. One of these tests can be in the form of MCQS and one of the practical tests can be OSPE.

The weightage given to internal assessment is 20% of total marks assigned for a subject.

A student must secure at least 35% of total marks fixed for internal assessment in a particular subject in order to be eligible to appear in the University Examination of that subject. (Vide Medical Council of India Notification on Graduate Medical Education (Amendment) Regulations 2003, published in the Gazette of India Part III, Section 4, Extraordinary issued on 15th October 2003).

Internal Assessment Examination can be conducted by Assistant Professor and above or lecturer with five years of teaching experience. Proper record of the work should be maintained which will be the basis of all students' internal assessment and should be available for scrutiny. The internal assessment marks of both theory and practical obtained by the candidates should be sent to the University at least fifteen days prior to the commencement of theory examination.

Phase I

Internal Assessment for Anatomy & Physiology

Total Marks: 80 (Theory – 60 and Practical – 20) - for each subject

Theory

For theory internal assessment, Minimum of three examinations is recommended. The sessional examination preceding the University examination may be similar to the pattern of University examination. Average of any two best marks obtained in the notified internal examinations may be taken into consideration for calculating internal assessment. The total marks be reduced to 60 and sent to the University.

Practicals

For practical internal assessment there will be two terminal examinations.

Five marks will be for records and 15 marks for terminal examinations. Average marks of the two terminal examinations shall be reduced to 15 marks and added to the marks obtained for records and sum of the two shall be sent to the University.

The internal assessment marks both theory and practical obtained by the candidates should be sent to the University at least fifteen days prior to the commencement of theory examination.

Internal Assessment for Biochemistry

Total Marks: 40 (Theory: 30 and Practical: 10)

Theory and Records

Minimum of three examinations are recommended. The examination preceding the University examination will be similar to the University examination. The total marks would be 30. Average marks secured out of best of two notified internal examinations should be reduced to 30. The sum of the marks obtained in theory and records shall be sent to the University.

Practicals

A minimum of two practical tests is to be conducted, one at the end of each term. Average of the two tests should be reduced to 10 marks and shall be sent to the University. Out of this 10 marks for practicals,3 marks can be allotted to records

1. University Examination –

Examination components, Subjects and Distribution of Marks

		Anatomy	**Physiology**	**Biochemistry**
A.	**THEORY**			
1.	**Written Paper** No. of Papers & Maximum Marks for each Paper	Two 2 X 100 = 200	Two 2 X 100 = 200	Two 2 X 50 = 100
2.	Viva-Voce	40	40	20
3.	Internal Assessment (Theory)	60	60	30
	Total (Theory)	**300**	**300**	**150**
B.	**PRACTICAL**			
1.	Practicals	80	80	40
2.	Internal Assessment (Practical)	20	20	10
	Total Practicals	**100**	**100**	**50**
	GRAND TOTAL	**400**	**400**	**200**

Table V: Type, number of questions and distribution of marks for written paper.

Type of Questions	**Number of questions**	**Marks for each question**	**Total marks**
Essay type questions	2	10	20
Short Essay types questions	10	5	50
Short answer questions	10	3	30
			100

8. SUBMISSION OF LABORATORY RECORD NOTE BOOK

Each candidate shall submit to the Examiners his/her laboratory notebook duly certified by the Head of the Department as a bonafide record of the work done by the candidate at the time of Practical/Clinical Examination.

The candidate may be permitted by the examiners to refer the practical record Book during the Practical Examination in the subject of Biochemistry only. No other material, handwritten, cyclostyled or printed guides are allowed for reference during the practical examination.

9. ELIGIBILITY FOR EXAMINATION:

To be eligible to appear for University examination a candidate:-

a. Shall have undergone satisfactory the approved course of study in the
b. Subject/subjects for the prescribed duration.
c. Shall have attended at least 75% of the total number of classes in theory and practical/clinical, jointly to become eligible to appear for examination in that subject/subjects.
d. Shall secure at least 35 % of total marks fixed for internal assessment in a particular subject in order to be eligible to appear in the University Examination of that subject.
e. Shall fulfill any other requirement that may be prescribed by the University from time to time.
f. Who fails in any subject/subjects of MBBS Phase -1, has to put one academic term before he/she becomes eligible to appear for the next examination.
g. Shall pass in all the Phase I (Pre-Clinical) subjects, before joining the Phase II (Para Clinical) subjects.

10. CRITERIA FOR PASS

For declaration of pass in any subject in the University examination, a candidate shall pass both in Theory and Practical/Clinical examinations components separately as stipulated below:

A student has to secure marks as follows to pass in a subject:

i) 35% in internal assessment (for eligibility to appear for University examination)
ii) 50% of the total marks for Theory with Orals (only externals)
iii) 50% of the marks of Practical / Clinical (only externals)
iv) 50% of the aggregate (total of externals and internals)

A candidate not securing 50% marks in aggregate in Theory or Practical/Clinical examination in a subject shall be declared to have failed in that subject and is required to appear for both theory and Practical/Clinical again in the subsequent examination in that subject.

11. DECLARATION OF CLASS:

a) A candidate having appeared in all the subjects in the same examination and passed that examination in the first attempt and secures 75% of marks or more of grand total marks prescribed will be declared to have passed the examination with distinction.

b) A candidate having appeared in all the subjects in the same examination and passed that examination in the first attempt and secures 65% of marks or more but less than 75% of grand total marks prescribed will be declared to have passed the examination in First Class.

c) A candidate having appeared in all the subjects in the same examination and passed that examination in the first attempt and secures 50% of marks or more but less than 65% of grand total marks prescribed will be declared to have passed the examination in Second Class.

d) A candidate passing the university examination in more than one attempt shall be placed in Pass class irrespective of the percentage of marks secured by him/her in the examination.

[Please note fraction of marks should not be rounded off for clauses (a), (b) and (c)]

12. MIGRATION

a) Migration from one medical college another is not a right of a student. However, migration of students from one medical college to another medical college in India may be considered by Medical Council of India, only in exceptional cases on extreme compassionate grounds, provided following criteria are fulfilled. Routine migrations on other grounds shall not be allowed.

b) Both the colleges, i.e., one at which the student is studying at present and one to which migration is sought, should have been recognized by the Medical Council of India.

c) The applicant candidate should have passed first professional MBBS examination.

d) The applicant candidate should submit his/her application for migration complete in all respects, to all authorities concerned within a period of one month of passing (declaration of results) the first professional Bachelor of Medicine and Bachelor of Surgery (MBBS) examination.

e) The applicant candidate must submit an affidavit stating that he/she will pursue 18 months of prescribed study before appearing for II professional MBBS examination at the transferee medical college, which should be duly certified by the Registrar of the concerned University in which he/she is seeking transfer. The transfer will be applicable only after receipt of the affidavit.

NOTE I :

i. Migration during clinical course of study shall not be allowed on any ground.
ii. All applications for migration shall be referred to Medical Council of India by college authorities. No Institution/University shall allow migration directly without the approval of the Council.
iii. Council reserves the right, not to entertain any application which is not under the prescribed compassionate grounds and also to take independent decision where applicant has been allowed to migrate without referring the same to the Council.

NOTE II : * Compassionate grounds criteria:

i. Death of a supporting parent or guardian
ii. Illness of the candidate causing disability
iii. Disturbed conditions as declared by Government in the Medical College area.

13. ELIGIBILITY TO JOIN PHASE II OF THE COURSE

Only candidates who pass in all the Phase I (Pre Clinical) subjects shall be eligible to join the Phase II of the course.

Section III

Course contents for MBBS Phase I

Human Anatomy

(i) Goal: Aims at conveying comprehensive knowledge of the gross and microscopic structure and

Development of human body to provide anatomical basis for diseases and clinical conditions.

(ii) Objectives:

A Knowledge:

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

a) Understand the normal disposition, functional and cross sectional anatomy of various structures of the body and its clinical relevance.

b) Identify the microscopic structure of various organs and tissue and comprehend their functions in order to understand the alterations in various disease processes

c) Comprehend functional organizations of central nervous system and interpret various signs and Symptoms presented as neurological deficit so that he/she may confidently make a diagnosis.

d) Demonstrate basic concepts of development of organs and tissues, explain the effect of teratogens, environmental factors and genetic mutations on critical stages of development.

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 USG 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 correlate the structure
and functions of the body in order to provide anatomical basis for various disease process.

(iii) Detail syllabus of Human Anatomy is given under following headings:

A) General Anatomy

B) Regional Anatomy

	I	- Upper limb
	II	- Lower Limb
	III	- 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 & Marking

H) University Exam pattern, Theory & Practical

I) Books recommended

A) GENERAL ANATOMY

1) 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 and Morphological Classification, Distribution and Functions of bone Appendicular, Axial.

Diaphysis, Metaphysis, Epiphysis, Types of epiphysis

Primary centres, Secondary centers, Law of ossification, Epiphy seal 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 and 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 and functions, Sprains

RETINACULA AND APONEUROSES

V) INTEGUMENT

a) Skin – Introduction: Surface area

Types: Thin, Thick, hairy, Functions, innervations

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:

Neuralgia: 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: Seller, Ovoid, Joint position:: Loose-packed, Close-packed

Number and diameter of fibres, Range of contraction. Active insufficiency, Passive insufficiency, shunts. Swing, spin

Adventitious burse- 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 surface. Spin, Swing, Cartilage Grafts, Kinesiology, Body liver system, Skin grafts. Ischemia, Infarct, Bursitis.

B) Regional Anatomy

1) UPPER LIMB

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

Relations and functional importance of individual structures, Duputytren'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; Carp metacarpal joint of

Thumb; Bones taking part.

Classification of joints, Movement with muscles causing movement, 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, Facial spaces: Surgical significanc

OSTEOLOGY

Identification: Anatomical position, Parts; Joints formed; Development; identification

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 ischemic contracture

Quadrangular and Triangular spaces, Triangle of auscultation.

ANGIOLOGY: Axillary, Brachial, Radial, Ulnar Arteries, Veins, Lymphatic's Commencement, Termination, Main area of distribution and drainage, Anastomosis

Applied aspects, Artery: Damage of vessels, Reynaud's disease, Veins: Thrombosis. Lymphatic's: 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 lignaments, menisci; (tear-bucket handle type); Ankle: Sprain mechanhism of venous return, varicose veins. Applied aspects of Adductor canal popliteal aneurysms.

OSTEOLOGY: Identification, region, anatomical position; parts joints formed For tarsals-identification of individual tarsal's 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 and applied.

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

Lymphatics: Inguinal group of lymph nodes

Level 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 hernia

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 and 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,Site of constructions, 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 and applied anatomy

URINARY BLADDER AND 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 and 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, sacrococcy geal joints.

vii) ANGIOLOGY: Origin, course, termination, relations, branches and applied anatomy of

PORTAL VEIN

Level 2: port systemic communications

Level3: Port systemic communications in detail: Development

INFERIOR VENA CAVA, ABDOMINAL AORTA, INTERNAL ILIAC ARTERY

IV) THORAX

i) THORACIC WALL, THORACIC INLET

Boundaries and contents

THORACIC OUTLET, Boundaries and contents, muscles Atypical intercostal space.

Movement of respiration.

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

Level 3: Applied aspects: Barrel chest, pectus exavatum, rickety rosary.

ii) 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: relations, blood supply, nerve supply

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 AND 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: 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 gland and 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, Mylohtyoid, 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 artery

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 and 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 and lower cervical mid-thoracic, Lumbar and 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 organization of white matter.

Level3: 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 and neocerebellum

v) MIDBRAIN

General features:

Relations, contents of interpeduncular cistern connections of red nucleus

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

Level 2 : Weber's syndrome Benedikt's syndrome

vi) CEREBRUM

CORTEX, WHITE MATTER, BASAL NUCLEL,LIMBIC LOBE

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

Gray – cortex – granular granular,/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, formina, 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

Level 3: 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, choroids plexus, Extracerebral and intracerebral communication, CSF block puncture, Cisterns - Definition, terminology, cisterna magna

Level 2: cisternal puncture, Queckensted's test, bertebral venous plexus, choroids 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 membnrane, Cell organelles

Mitochondrial DNA, mitochondrial myopathy

Level 2 : Specialisations of cell surface, Sarcopalsmic reticulum of muscle, Primary and secondary lysosomes, residual bodies, Effect of colchicines 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.

Bone & Cartilage

Bone, Compact, Cancellous, Developing bone; ossification, Woven, lamellar bone Cartilatge, Classification, types, Perichondrium functions.

Level 2 : Growth: Interstitial, Appositional: Bone callus,

Osteomalacia,Osteoporosis

Osteoma

Level 3: Chondroma

iv) 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.

v) Nervous

Neurons, types: Neuroglia, types: Myelinated nerve fibre LS: Non-myelinated nerve fibre; Peripheral nerve : Nodes of Ranvier: Synapses:

vi) 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. 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, Hirschgsprung'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) DEVELOPMENT 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 significicance of "Sex-ratio''

iii) Cleavage, Blastocyst, Cytotrophoblast, Syncytiotrophoblast

Implantation: Normal sites, Abnormal sites; Placenta praevia, Extra-embryonicMesoderm 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, Alphafetoprotein level

v) **Folding of the embryo** : Derivatives of germ layers, Pharyngeal arches

Level 2 : Thalidomide tragedy, Estimation of Embryonic Age – Superfoetation and Superfoecundation.

vi) **Fetal membranes :** Formation Functions, fate of Chorion; Amnion : Yolk sac: Allantois, Decidua; Umbilical cord; Placenta – Physiological function

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 – Chgambers – Septa – Truncus – Aortic arches – Fetal circulation – Changes at birth, ASDs. VSDs, PDA, Fallot'sTetralogy.

Level 2 :Veins, abnormalities, Surgical corrections.

ii) **The Respiratory System :** Development of Larynx, Trachea, Bronchi, Lungs: Tracheo-oesophageal Fistuala

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 and 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
Barium meal
Barium meal follows through
Barium enema
Oral cholecystogram
Intravenous urogram
Cystogram
Ascending pyelogram
Abdominal Aortogram
Hystero-salpingogram
Myelogram
CT abdomen

V) THORAX

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

VI) HEAD-FACE

X-ray skull plain

Carotid angiogram

Vertebral arteriogram

CT scan Brain

VII) NECK

Plain X-ray cervical region

G) SURFACE ANATOMY

I) SURFACE MARKING:

i) Upper Limb

NERVES: Radial nerve, Median nerve, Ulnar nerve, Axillary nerve, Musculocutaneous nerve

VESSELS : Axillary artery, Brachial artery, Radial artery, Ulnar artery, Superficial and deep palmar arches.

ii) Lower Limb

NERVES: Femoral, Sciatic, Common peroneal nerves

VESSELS: Great saphenous and Small saphenous veins; Femoral, Popliteal and Dorsalis pedis arteries.

iii) ABDOMEN

ORGANS: 9 regions and projection of organs in them; Stomach, Duodenum, Caecum. Appendix. Ascending, transverse and descending colon. Pancreas, Liver, Gall bladder, Spleen, Kidneys (ventral and dorsal)

Abdominal aorta

iv) THORAX

Heart and valves, Lungs, fissures and hilum; Pleurae, Trachea

v) HEAD FACE NECK

ORGANS: Parotid gland and duct

Middle meningeal artery, Facial artery Pterion, Bregma, Reid's base line, Suprameatal triangle,Thyroid gland,Common carotid artery, External carotid artery, Internal carotid artery, Internal Jugular vein, Trachea

vi) Brain Lateral sulcus, Central sulcus, Median longitudinal fissure, Superior sagittal sinus, Sigmoid sinus, transverse sinus.

II) LIVING ANATOMY

i) Upper Limb

PALPATION OF BONY LANDMARKS

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):Axillary artery, Brachial artery, Radial artery

OTHERS: Axillary groups of lymph nodes; Anatomical snuff-box (boundaries)

ii) Lower Limb

PALPATION OF BONY LANDMARKS 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 Joint JOINTS (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.

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:

Level 2: 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 moveme

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 C7

DEMONSTRATION OF MOVEMENTS): Atlanto-occipital joint, Cervical joints

(DEMONSTRATION OF ACTION): Sternocledomastoid, Neck flexors andExtensors

(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).

1. TRAINING PERIOD AND TIME DURATION

The period of 4 ½ years is divided into three phases as follows
Phase 1-two semesters (each semester of 6 months) consisting of pre clinical subjects, human anatomy, physiology including bio physics, bio chemistry and introduction to community medicine including humanities.
Besides 60 hours for introduction to community medicine including humanities rest of the time shall be some what equally divided between anatomy and physiology plus bio chemistry combined.(physiology 2/3 and bio chemistry 1/3).
Each semester will consist of 120 teaching days of 8 hours working time including 1 hour of lunch break.

2. ACADEMIC TERMS

All the candidate admitted beyond the last date stipulated by the university shall have to appear for the first professional examination to be held subsequent to the regular examination after completion of the prescribed duration.

3. ATTENDANCE

Every candidate should have attendance minimum of 75% of the total classes conducted in theory and practical's jointly in each calendar year calculating from the date of commencement of the term to the last working day as notified by the university in each of the subjects prescribed to be eligible to appear for the university examination[vide medical council of India notification on gazette medical education(amendment)regulations 2003 published in the gazette of India part 3, section-4 extraordinary issued on 15 the October 2003].
The attendance details at the end of each term should be submitted to the principal without fail for onward intimation to the university.
The candidate lacking in prescribed attendance and progress in the subject in theory or practical for the first attempt should not be permitted to appear for the examination in that subject.

Distribution of Teaching hours for Phase-1

Total number of working days	-	240 days
Total working hours per day	-	07 hours
Total working hours for phase-1	-	1680 hours
Total working hours for community medicine	-	60 hours
Total working hours for pre clinical	-	1620 hours
Total working hours for anatomy	-	810 hours

Details of working hours for Anatomy

Lectures	-	6 hours/week
Tutorials	-	1 hour/week
Demonstration/Short lecture-	-	1 hour/week
Practical	-	2 hours/week
Dissection/group discussion	-	10 hours/week
Total working hours per week	-	20 hours

Distribution of number of hours for Theory & Practical Classes

I) A. Theory Classes:	-	
1. General Anatomy	-	10 hours
2. Upper limb	-	20 hours
3. Lower limb	-	25 hours
4. Head and Neck	-	25 hours
5. Brain	-	15 hours
6. Thorax	-	15 hours
7. Abdomen and Pelvis	-	30 hours
8. Histology	-	40 hours
9. Embryology	-	40 hours
Total hours of Theory Classes	-	220 hours

B. Tutorial Classes:	-	80 hours
II) Practical Classes:		
A) Dissection	-	
1. Upper limb	-	60 hours
2. Lower limb	-	60 hours
3. Head and Neck	-	120 hours
4. Brain and Eyeball	-	40 hours
5. Thorax	-	40 hours
6. Abdomen and Pelvis	-	100 hours
Total hours of Dissection Classes	-	420 hours
B) Histology	-	80 hours

INTERNAL ASSESSMENT

THEORY

Minimum 3 examinations recommended. They should be conducted like university examination pattern. Average marks of the best two notified internal examination should be reduced to 60.

If the student is absent for internal assessment examination, the cause is genuine provision should be made for the examination on other notified date.

Day to day assessment should be given 10% weight age. The marks will be given on the basis of the :

1. Part completion test
2. Tutorial test
3. Card test-which will include 50% oral and 50% MCQ's
4. Seminar presentation and participation.

All the records should be maintained and must be ready for the verification from the university and if asked by the students.

Theory, Practical, Viva will be given equal weight age for I.A.
For eligibility to write examination student should get minimum of 35% in I.A.

PRACTICALS

Total practical assessment out of 20.

5 marks are allotted for the records (Gross + Histology) and 2 best practical examination should be taken into consideration. Attained marks should be reduced to 15, added to the marks awarded for records.

Internal Assessment Marks should be notified to the students well in advance and their signature to be taken before submitting to the university.

UNIVERSITY EXAMINATION
DISTRIBUTION OF MARKS

1. Theory

Written paper, number of papers and maximum marks for each paper.

Paper-1

Above diaphragm (100 marks)

100 Marks

2 long questions	-	2x10=20 marks
10 short essays		10x5=50 marks
10 short answers	-	10x3=30 marks

Paper-2

Below diaphragm (100 Marks)

100 marks

2 Long questions	-	2x10=20 marks
10 Short essays		-10x5=50 marks
10 Short answers	-	10x3=30 marks

2. viva-voice (40 marks)

Above diaphragm	-	10 marks
Below diaphragm	-	10 marks
Radiology	-	10 marks
Embryology	-	10 marks

THEORY (200 MARKS)

Paper-1(100)	Paper-2 (100)
Head & Neck----------25 marks	Abdomen----------20 marks
Brain/spinal cord-- --------10 marks	Pelvis and perineum----------10marks
Upper limb----------15 marks	Lower limb----------20 marks
Thorax & diaphragm-------15 marks	Systemic histology----------10 marks
General embryology } 15 marks	Genetics----------10 marks
General anatomy } 15 marks	Systemic embryology---------- 10 marks
General histology } 15 marks	

Practicals (80 marks)

1. Gross anatomy-----50 marks

A. Spotters--identification of structures in given specimen-10x2=20 marks.

B. Surface marking---10 marks
C. Discussion---------15 marks above diaphragm
15 marks below diaphragm

2. Histology---------30 marks

A. Spotters----identification of nine slides and interpretation of one chart (genetics). 10x1=10 marks
B. Discussion on two given slides---5x2=10 marks.
C. Staining----10 marks

3. Viva-voce----------40 marks

Above diaphragm-----10 marks
Below diaphragm-----10 marks
Embryology---------- 10 marks
Radiology---------- 10 marks

Colour Pencils and Sketch Pens to be used for gross diagrams and haemtoxylin and eosin pencils for histology.

During setting of the theory paper allotment of marks on the basis of three levels will be as

Level 1	75%
Level 2	15%
Level 3	10%

Time slot for viva for a candidate minimum 03 minutes and maximum up to 06 minutes.

Anatomy Books Recommended

1) Gray's Anatomy
2) Sahana's Human Anatomy
3) Text Book of Anatomy Henry/ Rosse
4) Grant's Methods of Anatomy
5) Essentials of Human Anatomy A.K.Datta Vol. 1 to 3
6) Cunningham's manual of Practical Anatomy Vol. 1 to 3
7) Regional Anatomy by R.J.Last
8) Human Histology by Inderbir Singh

9) Atlas of Human Histology-DIFORE
10) Histology by Ham
11) Text book of Histology and Practical Guide -JP Gunasegaran
12) Surgical Anatomy- McGregor
13) Human Embryology- Inderbir Singh
14) Human Embryology by Sudhir Sant
15) Medical Embryology- Langman
16) Developing Human – Keith Moore
17) Surface Anatomy and Radiology- Halim
18) General Anatomy- B.D.Chourasia
19) General Anatomy by A.K.Datta
20) Text Book of Neuroanatomy- Inderbir Singh
21) Clinical Anatomy for Medical Students by Richard Snell
22) Human Osteology by Inderbir Singh
23) Human Genetics – SD Gangane
24) J.S.P.Lumbley et.al – M.C.Q's in Anatomy
25) Gray's anatomy for students – Drake
26) Dorland's Medical dictionary
27) Clinically Oriented Anatomy – Keith.L.Moore

PHYSIOLOGY

I) Goal :

The goal of teaching Physiology to undergraduate students is to make them understand the Physiological Principles and Homeostatic mechanisms of Normal Human body so that he/she can understand the disease pattern better.

II) Objectives :

01. Learn normal functioning of all organs, systems and their interactions for well co-ordinated body function.
02. To assess relative contribution of each organ system to the maintenance of the milieu interior.
03. Elucidate the Physiological aspects of normal growth and development.
04. Describe the Physiological response and adaptations to environmental stress.
05. List Physiological Principles underlying pathogenesis and treatment of disease.
06. To apply Physiologic knowledge in Research activities.
07. To initiate to participate in Seminar.

Knowledge : At the end of the course the student will be able to .

01. Describe the normal functioning of all the organ systems, regulatory mechanisms and interactions of various organs for well co-ordinated total body function.
02. Understand the basic Principles, mechanisms and homeostatic control of all the functions of human body as a whole.
03. Lay emphasis on Physiological basis in diagnosis and Management of diseases.
04. Correlate knowledge of Physiology in area indicated by National Health Programme.

B) **Skills :**

At the end of the course, the student shall be able to acquire the skills

01. To conduct the experiments for study of Physiological functions.
02. To interpret experimental and Investigative data.
03. To distinguish between normal and abnormal data derived as a result of Tests which he /she performed and observed in the Laboratory.
04. To understand different types of Biomedical waste, their potential risk and their management.

C) **Integration :**

At the end of the Integrated Teaching, the student shall acquire an integrated knowledge of organ structure and function and the regulatory mechanisms including Biophysics.

Teaching Hours

Total No. of Hours	:	480hrs.
Theory didactic Lectures	:	160hrs.
Non Lecture Teaching (Tutorials + Group Discussion)	:	40+40hrs.
Practical /Demonstrations	:	240hrs.

Course Contents

01. **Theory** : **160hrs.**

01. **General Physiology including Biophysics.** **: 08hrs.**

Must know

History of Medicine with special reference to Physiology, Homeostasis, Concepts of Physiological norms range and variations, Transport across Cell membrane, relationship between stimulus and response. Structure of cell membrane, RMP, Cellular receptors, Intercellular communications. Body Fluids Compartments, changes in Body Fluid and their Measurements Hypoproteinemia.

Desirable to know

Apoptosis, Aging, Genetics overview, Principles and uses of tissue grafting.

02. **Blood & Lymph : 16hrs.**

Must know

Blood composition ; cellular elements of blood their formation and regulation. Hemoglobin : Synthesis and functions Jaundice, Anemia & their Classification, Hemostatic mechanisms, Anticoagulants, Blood groups, Rh- incompatibility Blood transfusion, ESR, Basic Mechanisms of Immunity & Function of WBC, Lymph : Composition Circulation and functions.

Desirable to know

Principles and uses of blood components and blood components therapy 03.

03. **Gastro intestinal Tract. : 12hrs**.

Must know

Functional Morphology Smooth Muscle : Structure Mechanism of Contraction. Nerve supply and Nerve transmitters. Composition Function and regulation of secretion of Salivary glands, Stomach, Small Intestine and large Intestine.

Regulation of gastrointestinal Movements, Functions of Gall bladder, liver. Site of production and action of GI Hormones. Mechanism of Absorption of food.

Physiological basis of Peptic ulcer, Diarrhoea and Constipation.

Motility disorders : Achalasia, Hirschsprung disease.

Desirable to know

Balance diet, Effect of starvation, Pathophysiology and Physiological basis of treatment of obesity

04. **Respiratory System: 12hrs.**

Must know

Functional anatomy of Respiratory systems, Mechanics of Normal respiration, Physical Principles governing flow of air in respiratory passages, Lung Compliance, Alveolar ventilation, ventilation perfusion Ratio, Oxygen transport, Diffusing capacity, pulmonary function Tests.

Regulation of respiration, Respiratory acidosis and alkalosis, Pulmonary blood flow, Hypoxia, Cyanosis, Asphyxia, Respiratory adjustments during muscle exercise, Hyperbaric conditions, Principles of Oxygen therapy, Artificial respiration, Hyaline Membrane disease, Pathophysiology of Restrictive and obstructive lung diseases, Pulmonary edema, Decompression sickness, Hyper baric Oxygen therapy and Dyspnoea.

Desirable to know

Technique and uses of computerized pulmonary function testing and blood gas analysis

06. **Cardiovascular System : 25hrs.**

Must know

Functional anatomy of heart, properties of cardiac muscle Principles of Electro cardiography, Electrical and Mechanical changes in cardiac cycle, Conducting system of Heart Normal ECG, Cardiac output : Measurement in Man, Physiological Variations.

Regulatory mechanisms of Heart rate and Blood pressure. Physical Principles governing flow of blood in Heart and blood vessels, Measurement and regulation of coronary blood flow, changes in CVS during muscular exercise, Postural changes, Hypovolemia, Hypoxia, and cardio pulmonary resuscitation. Microcirculation. Hemodynamics Pathophysiology of Hypertension shock, cardiac failure and coronary Artery Disease.

Desirable to know

Abnormal ECG, Principles and uses of Stress test and echocardiography.

07. **Kidney : 10hrs.**

Must know

Functions of different parts of Nephron, urine formation, Role of Kidney in water and Electrolyte balance. Acidification of urine. Diuresis, Kidney function tests. Juxtaglomerular apparatus. Renin - Angiotensin system, Renal blood flow. Structure and its and measurement regulation. Innervation of bladder, Micturition, Cystometrogram, Disorders of Micturition and Principles of Artificial kidney.

Desirable to know

Classification, uses and disadvantages of Diuretics

08. **Muscle Nerve Physiology: 08hrs.**

Must know

Classification of Nerves and Muscle, Structure of skeletal muscle. Types of muscle fibers. Mechanism of contraction and Its molecular basis.

Thermal and chemical changes during muscle contraction. Oxygen debt. Neuromuscular Transmission Neuromuscular blocking drugs. Neuromuscular disorders Pathophysiology of Myasthenia Gravis.

Desirable to know

Experimental techniques to study bioelectrical phenomena such as cathode ray oscilloscope and nerve conduction studies.

09. **Endocrine glands : 16hrs**.

Must know

General Principles of Regulation of Endocrine glands. Hormonal functions, cellular mechanism of hormone action., regulation of secretion.

Experimental and clinical disorders of Anterior and Posterior Pituitary, Thyroid, Parathyroid, Adrenal Cortex and Medulla and Endocrine Pancreas. Stress and Hormones, Physiology of Growth Minor Endocrine glands : Pineal Body, Heart and Kidney. (Must know)

Desirable to know

Experimental techniques to study various endocrine disorders, Principles and uses of radioimmunoassay

10. **Reproduction : 10hrs.**

Must know

Sex determination and differentiation (1hr). Male Reproduction; Functions of Testes, Constituents of Semen, Testicular hormones, Spermatogenesis and regulation. (3hrs) (Must know) Female Reproduction: Menstrual Cycle: Changes in ovary, uterus, Cervix, vagina and hormonal regulation. Ovulation and Its detection. Fertilization, Implantation, Physiological changes during pregnancy Fetoplacental Unit, Nutritional needs of mother during pregnancy, Parturition, Lactation, composition of breast milk, Placental and Fetal Circulation, Menopause, Physiology of Newborn (5hrs). (Must know) Family planning & welfare: Physiological basis of Contraception, safe period, rhythm and other methods of contraception (01 hr) (Must know)

Desirable to know

Disorders of sex differentiation and aberration, Principles and indications for assisted reproduction

11. **Central Nervous System : 32 hrs.**

Must know

Organisation of Central Nervous system, Functions and Neuronal organisation at spinal cord level, synaptic transmission, motor and sensory systems and their lesions, Reticular system in brain stem, sleep, wakefulness, EEG waves and Physiological changes in EEG, clinical lesions and Experimental sections at spinal cord, brain stem and sub cortial levels, Physiology of Basal Ganglia, Cerebellum, Thalamus, Hypothalamus limbic system, Pre frontal lobe and cerebral cortex, speech and its disorders, Autonomic Nervous system,, Formation, circulation and functions of CSF, Blood Brain Barrier, Central Neuro transmitters. Cerebral blood flow and its measurements. Neuroglia, Physiological basis of CNS Disorders like Alzheimer's disease, Parkinsonism, Syringomyelia and Tabes dorsalis.

Desirable to know

Experimental studies of lesions at spinal cord, brain stem and sub cortical levels. Principles and uses of CT and MRI Scan, Yoga and Meditation. Structure and functions of skin, Regulation of body temperature and cutaneous blood flow.

Mechanism of fever, Cold injuries and heat stroke, Principles and uses of induced hypothermia

12. **Special Senses : 10hrs.**

Must know

a) Eye : Functional anatomy of Eye, image formation on Retina, Structure of photoreceptors, Electrical activity of photoreceptors, Errors of Refraction, Functions of Aqueous humour, Intraocular tension. Mechanisms of Accommodation Dark adaptation, pupillary reflexes functions of Retina optic pathway and lesions. Role of visual cortex in perception. Field of vision. Colour vision, Acuity of vision, Photochemistry of vision, Nutritional deficiency blindness (5hrs).

b) Auditory Apparatus : Functional anatomy of Ear, Physics of sound , Role of Tympanic Membrane, Middle ear and cochlea in hearing , Auditory Receptors and Pathway, Deafnes and its causes, Principles of Audiometry, Tuning fork tests & Interpretation.

Vestibular apparatus : Structure and Functions, Connections and lesions of vestibular apparatus (4hrs).

c) Taste and Smell : Modalities, Receptors, pathway, Cortical and limbic areas associated with taste and smell. (1hr).

Desirable to know

Visual and auditory evoked potential.

13. **Biomedical Waste : 01hr.**

Types, Potential Risks and their safe management.

2. Practicals

The following list of practicals are minimum and essential. Additional exercises can be included as and when feasible and required. All the practicals have been categorized as Procedures and Demonstration. The procedures are to be performed by

the students during practical classes to acquire skills. Some of these would be included in the practical during University examination. Those categorized as "Demonstrations" are to be shown to students during practical classes. However, these Demonstrations would not be included in the university examinations, but questions based on these would be given in the form of data, charts, problems and case - histories for interpretation by students.

Procedures to be performed by the students :

I. Hematology :

1. RBC count 2. Total WBC Count 3. Differential WBC Count.
4. Absolute Eosinophil Count.
5. Estimation of Hemoglobin Content of blood.
6. Bleeding Time
7. Clotting Time.
8. Blood Grouping.
9. Determination of blood indices : MCV, MCH, MCHC and Colour Index.

II. Procedures to be performed on human subjects.

1. Mosso's Ergography : at normal condition, after venous occlusion and arterial occlusion.
2. Recording of Arterial Blood Pressure, effect of posture and exercise on it.
3. Stethography : at rest, effect of deglutition, exercise, voluntary hyperventilation and voluntary breath holding.
4. Spirometry : Lung volumes and capacities and FEV1, MVV & Dyspnoeic Index.
5. Visual field by Perimetry.
6. Body composition -BMI (by Quetlet's Index) & Body Fat % by Durenberg's equation, Calculation of BSA and Body temperature (TPR chart).

III. Clinical Examination

1. Clinical Examination of Radial Pulse.
2. Clinical Examination of Cardiovascular system.
3. Clinical Examination of Respiratory system.
4. Clinical Examination of Higher functions.
5. Clinical Examination of Sensory System.
6. Clinical Examination of Motor system including examination of Reflexes.
7. Clinical Examination of Cranial Nerves.

IV. Interpretation of charts, graphs, case histories, Calculations & Demonstrations:

1. Hematology : Hematocrit, (PCV) ESR, Platelet count and Reticulocyte count osmotic fragility test.
2. Cardiovascular system : ECG Recording in lead II and calculations .
   Cardiovascular fitness test by 2 km walk test or bicycle ergometer or Harvard step test.
3. Nervous system : Autonomic Function Tests.
4. Amphibian Practical : Muscle - Nerve and heart experiments may be demonstrated if feasible for academic interest only and not for university examination.
5. Respiratory system: Determination of lung volumes and capacities & other lung function tests by computerised spirometry.
6. Special Senses :
   Audiometry , Purkinje - Sanson's images, ophthalmoscopy, Retinoscopy, Examination of fundus.
7. CNS : Electroencephalogram.
8. N.M.Physiology : Electromyography.

Scheme of Examination

Internal Assessment

Total Marks: 80 (Theory: 60 and Practical: 20)

Theroy: 60 Marks

There should be regular Formative assessment. Day to day performance should be given greater significance. Minimum of three sessional examinations are to be conducted. The sessional examination preceding the university examination may be similar to the pattern of university examination.

Average of any two best marks obtained in the examinations will be taken into consideration for calculating Internal assessment. 20% weightage will be given to day to day assessment (Performance in Periodic tests, MCQ, diagram training programme & structured viva voce training programme. Participation in Seminars and Research Projects etc). One of the three sessional examinations will be on MCQ. Average marks obtained in two best sessional examinations and marks obtained for day to day assessment will be added and the sum of these two shall be sent to the University.

Practical: 20 Marks

There will be three terminal practical examinations. Average of best two will be reduced to 15 and marks obtained for Practical Records and performance in periodic practical tests will be reduced 05. One of the three terminal examinations will be OSPE Type. The Internal Assessment Marks both in theory and practical's obtained by the candidate will be sent to the University at least fifteen days prior to the commencement of Theory Examinations.

The Internal Assessment marks should be displayed on the notice board. The students should be shown their answer scripts. Their signatures have to be taken against the marks obtained. The answer scripts should be stored in the respective department for 3yrs.

University Examination

Eligibility for writing the University examination :

Every candidate should have attendance not less than 75% of the total classes conducted in theory and practical/clinical jointly in the academic year calculated from the date of commencement of the term to the last working day as notified by the University in each of the subjects prescribed to be eligible to appear for the university examination. (vide Medical

Council of India Notification on Graduate Medical Education (Amendment) Regulations 2003 published in the Gazette of India Part III, Section 4, Extraordinary issued on 15th October 2003).

The Principal should notify at the College, the attendance and progress in any subject(s) in theory or practical / clinical in the* first appearance should not be permitted to appear for the examination in that subject(s).*

Criteria for Pass

A student has to secure marks as follows to pass in a subject:

i) 35% in internal assessment (for eligibility to appear for University examination)
ii) 50% of total marks for theory with orals (only externals)
iii) 50% of marks in Practical/Clinical (only externals)
iv) 50% of aggregate (total of externals and internals)

Distribution of Marks for University Examination

Theory Examination

It is of three hundred marks in total, which consist of university theory examinations (Paper I and Paper II, 100 Marks each). 200 Marks.

University Viva Voce examination: 40Marks.

Theory I.A. : 60Marks.

Distribution of Portions for theory Papers will be as follows :

Paper - I

General Physiology (4), Blood (20), Cardiovascular system (24), Respiratory system (20). Gastrointestinal system (20), Renal system (12), (Note : Marks for Renal and Gastrointestinal system can be interchanged. (Figures shown in parentheses are weightage of marks recommended for the different topics).

Paper - II

Endocrine (20), Special senses (20), Reproduction (12), Central Nervous System (28), Muscle - Nerve (16), Skin and Body Temperature (4), Note : Marks for Endocrines and Reproduction can be interchanged. (Figures shown in parentheses are weightage of marks recommended for the different topics).

* The topics assigned to the different papers are generally evaluated under those sections. However, a strict division of the subject may not be possible and some overlapping of topics is inevitable. Students should be prepared to answer overlapping topics.

Scheme of Marks distribution

Paper - I 100Marks

Paper- II 100Marks

Duration of Each Paper will be 03hrs.

The Pattern of Questions will be of 03types.

I	Long Essays	02x10=20Marks
II	Short Essays	10x05=50Marks
III	Short Answers	10x03=30Marks.

B. Practical : 80 Marks

There shall be two practical sessions, Practical I and II, each carrying 40marks, each practical will be

of 2hrs., duration. The distribution of content and marks for the practical would be :

Practical IA:		20Marks
1. Clinical Examination	-	20 Marks.
2. Procedures on Human Subjects	-	20Marks.
Practical II:		40 Marks.
3. Hematology (Major)	-	20Marks.
(Minor)	-	10Marks.
4. Interpretation of case histories/problems/ charts	-	10Marks.

C. Viva - Voce Examination : 40 Marks.

The viva - voce examination shall carry 40 marks and all examinations will conduct the examination.

Table 1 - Portions of Paper I	-	20 Marks.
Table 2 - Portions of Paper II	-	20 Marks.

Recommended Test Books and Reference Books

Deciding which textbook to buy is not an easy task. Choice of a textbook depends on the individual and his or her aptitude. It is desirable, and would certainly be helpful if each student has one textbook out of the recommended list of textbooks. The list of books under the section Reference books are categorized under three levels of difficulty-level-1 being the easiest. The books under level 1 are meant for providing an overall, simple but comprehensive account of physiology. Books at level 2 can be considered as alternative

textbooks and some of them are excellent books for further reading. Level 3 books are really meant for purpose of reference during advanced study in any special area of Physiology.

Text Books (Latest Edition)

1. A.K.JAIN (RL), Understanding Medical Physiology ; Text book for medical students, Jaypee brothers, New Delhi.
2. MAHAPATHRA. Essentials of Medical physiology, Current books international, Calcutta.
3. CHAUDHURI (Sujith K), Concise Medical Physiology, New Central Books, Calcutta.
4. GUYTON (Arthur C), Text of Medical Physiology. Prism Publishers, Bangalore.
5. GANONG (William F), Review of Medical Physiology, Appleton and Lange
6. TORTORA (Gerald J), Principles of Anatomy and Physiology Harper Collins Ref. College Publication.

Reference Books

Level -1

MORAN Campbell E.J. Clinical Physiology, ELBS UK,

Level -2

1. BERNE (Robert M) and levy (Mathew), Physiology, Mosby Publication.

2. SCHMIDT (RF) and THEWS (G), Human Physiology, Spinger VErlog, London.

Level -3

1. MOUNTCASTLE (Veernow B), Medical Physiology.
2. PATTON (Harry d), Text book of Physiology.
3. RAINER AND NINDHAERST - Text of Physiology - Springer verlog, London.

Text Books on Practical Physiology (Latest Edition)

1. Ghai., A textbook of Practical Physiology.
2. McLeod, Clinical Examination.
3. Hutchinson & Hunter, Clinical Methods.
4. A.K.Jain - Manual of Practical Physiology.

TOPICS FOR INTEGRATED TEACHING PROGRAMME
FOR MBBS PHASE I COURSE

Sl. No	Topics	Department to organize	Departments to participate
1	***Cell Membrane***: Structure (Anat), function(Bioc) and transport across the cell membrane (Phy)	Biochemistry	Anatomy, Physiology, & Biochemistry
2	***Anaemia*:** Pathophysiology (Patho), Investigation & treatment (Med) & Public health importance (Comm Med)	Physiology	Physiology, Biochemistry, Pathology & community Medicine
3	***Human Genetics:*** Anatomic considerations(Anat), applied aspects (Surgery & Paed)	Anatomy	Anatomy, Physiology, Biochemistry, Surgery & Pediatrics.
4	***Acid base balance*** General considerations (Bioc), Acid Base balance (Phys) & disorders & Treatment (Med).	Physiology	Physiology, Biochemistry, Medicine
5	***Acid Peptic disease*:** Anatomy of stomach(Anat), Functional aspects of stomach (Phy), Pathophysiology of Acid Peptic disease (Path), Medical Management of acid peptic disease (Med), Surgical Management of acid peptic disease (Surg)	Anatomy	Anatomy, Physiology, Pathology, Medicine & Surgery.
6	***Liver*:** Structure of Liver (Anat), functional aspect of liver (Phys), Biochemical aspect of liver (Bioch)	Anatomy	Anatomy, Physiology, Biochemistry.
7	***Myocardial infarction*:** Anatomy of coronary arteries (Ana), physiological aspects of coronary blood flfow (Phy), Pathophysiology of CAD (Pathology), Biochemical markers in CAD (Bioch), Medical management of CAD (Med), surgical management of CAD (Surg).	Physiology	Anatomy, Physiology, Pathology, Biochemistry, Medicine, & Surgery.
8	***Parkinsonism*:** Anatomy of Basal Ganglia (anat), Physiology of BG (Phys), clinical features, investigations & treatment (Med)	Anatomy	Anatomy, Physiology, Medicine.

BIOCHEMISTRY

GOALS : - The broad goal of teaching of Biochemistry to undergraduates is to develop scientific temper, acquire educational experience for proficiency in profession & promote healthy living.

The knowledge acquired in Biochemistry shall help the student to integrate molecular events with structure and function of the human body in health and disease. To acquire basic practical skills for Biochemical investigation in order to support clinical diagnosis of common disorders. To promote research activities for students and staff.

OBJECTIVIES: - At the end of the course, the learner shall be able to

1) Understand, describe and summarize the molecular and functional organization of cells, structure, functional relationship and interrelationships of various biomolecules in health and disease.
2) Summarize the basic and clinical aspects of enzymology with emphasis on diagnostic and therapeutic uses of enzymes.
3) Understand and describe digestion, assimilation of nutrients, associated disorders like obesity, starvation, malnutrition and malabsorption syndrome.
4) Understand, describe and integrate the various metabolic pathways and their regulation.
5) Describe mechanisms involved in water, electrolyte and acid base balance and its disorders.
6) Understand and summarize basic molecular mechanism of organization of genome. Genetic expression and regulation, recombinant DNA technology and genetic engineering and explain the biochemical basis of common inherited disorders in India.
7) Summarize the basic aspects of immunology including body defense mechanism.
8) Biochemical aspects of carcinogenesis and effects of xenobiotics.
9) Basic principles of medical biotechnology and their applications in medicine.
10) Continue to learn recent advances in Biochemistry and apply the same in medical practice.
11) Identify principles of routine and specialized biochemistry, laboratory investigations and techniques, analysis and interpretation of biochemical laboratory techniques.
12) Use basic devices for qualitative and quantitative biochemical investigations.
13) Understand different types of biomedical waste, their potential risks and their management.
14) Explain the biochemical basis of inherited disorders with their associated sequelae.
15) Understand the biochemical basis of environmental health hazards

SKILLS – At the end of the course, student shall be able to

a. Make use of conventional techniques and perform relevant biochemical investigations for clinical screening and diagnosis.
b. Analyze and interpret laboratory investigations.
c. Demonstrate skills for solving clinical problems and arrive at final diagnosis using laboratory data.

TEACHING HOURS:

CHEMICAL STRUCTURE S ARE NOT MANDATORY FOR UNDER GRADUATES

(1) Lectures	120 hours.
(2) Tutorials/ Group Discussion	20 hours.
(4) Seminars / Monthly tests Internal assessment & Revision classes.	20 hours.
(5) Practicals / Demonstration	80 hours (40x2)
	Total 240 hours

DISTRIBUTION OF THEORY CLASSES

1. Introduction & History of Biochemistry	1 hrs
2. Cell & sub cellular structures	2 hrs
3. Acids, bases, pH, Buffers, Henderson Hasselbalch equation.	1 hrs
4. Radioactive isotopes & their application in Medicine	1 hrs
5. Enzymes	9 hrs
6. Vitamins	9 hrs
7. Bioenergetics & Biological oxidation	3 hrs
8. Carbohydrate- chemistry, digestion, absorption & metabolism	15 hrs
9. Lipids- chemistry, digestion, absorption & metabolism	14 hrs
10. Protein- chemistry, digestion, absorption & metabolism	18 hrs
11. Integration of metabolism and citric acid cycle	1 hr
12. Molecular Biology, Molecular Genetics & Medical Biotechnology	15 hrs
13. Haemoglobin chemistry and metabolism	4 hrs
14. Organ function tests - LFT, KFT & Thyroid Function tests.	3 hrs

15. Acid base balance & its disorders 3 hrs

16. Water , electrolyte balance & its disorders. 1 hrs

17. Detoxification mechanism and metabolism of xenobiotics, Entoxification 1 hrs

18. Mineral Metabolism 5 hrs

19. Nutrition & Energy metabolism, Diet planning 5 hrs

20. Biochemistry of Cancer 1 hrs

21. Biochemistry of AIDS 1 hr

22. Tissue proteins in Health & disease 3 hrs

23. Mechanism of action of peptide and Steroid hormones 1 hr

24. Biochemical aspects of atherosclerosis & Biochemical markers of MI 1 hr

25. SI units, quality control. 1hr

26. Biomedical waste management 1hr

COURSE CONTENTS

i) Theory 140 hrs.

SL. NO	MUST KNOW	DESIRABLE TO KNOW
01	**Introduction**- Scope of Biochemistry. 1 **hrs**	History of Biochemistry and medical biotechnology.
02	**Cell and sub cellular structures and its functions** 2 **hrs** i) Cell membrane composition ii) Transport across cell membrane a. Active transport. b. Facilitated diffusion. c. Receptor mediated transport. d. Endocytosis.	Cell receptors
03	**Acids, bases, pH, buffers**- buffering capacity, mechanism 1 **hrs** of action, Henderson Hasselbalch's Equation (without derivation) and its clinical application.	Application of ABG
04	**Radioactive isotopes and their application in medicine**. 1 **hrs** i. Radiation, isotopes, half life, units of radio activity. ii. Isotopes in research, diagnosis and treatment, methods of study of intermediary metabolism.	Radiation Hazards

05	**Enzymes** **9 hrs** i. Nature of enzymes, Classification, coenzymes, cofactors & activators. ii. Mechanism of action, specificity of enzymes iii. Enzyme Kinetics, physical factors affecting enzyme action, Km value and its significance (derivation of Km is not required) iv. Enzyme inhibition –irreversible & reversible- competitive, non-competitive, uncompetitive, importance of competitive inhibition. Anti- metabolites and their clinical application. v. Regulation of enzyme activity- Hormonal, Feedback inhibition, covalent modification, allosteric, induction, repression, stabilization & compartmentalization. vi. Clinical enzymology – Enzymes, Isoenzymes and their diagnostic significance (LDH, CPK, AST, ALT, ALP, NTP, GGT, ACP, Cholinesterase, G-6- PD, amylase, lipase) vii. a) Therapeutic uses of enzymes (Asparginase, Streptokinse, Urokinase, streptodornase, hyluronidase, pancreatin, papain, alpa – 1 antitrypsin) b) Uses of enzymes in clinical laboratory (Urease, Uricase, Glucose oxidase peroxidase, Hexokinase, Cholesterol oxidase, lipase, Horse radish peroxidase, ALP, Restriction Endonuclease, Reverse transcriptase). viii) ELISA & RIA.	Immobilized enzymes.
06	**Vitamins** 9 **hrs** Classification, Chemical nature (detailed structure is not required), coenzyme forms, biochemical functions, sources, requirement, deficiency manifestations, antagonists and toxicity. i. Vit A. ii. Vit D. iii Vit E and Vit K. iv. Thiamine, Riboflavin. v. Pyridoxine, Pantothenic acid. vi. Niacin, biotin. vii. Folic acid (details of one carbon metabolism is not required viii. Vit $B_{12.}$ ix. Vit C. **x.** Free radicals, antioxidants,	Nitric oxide &, Nitric oxide synthase complex.
07	**Bioenergetics and biological oxidation**. 3 **hrs** i. Bioenergetics, redox potential, high energy and low energy compounds, Enzymes involved in ETC. ii. ETC components & arrangement. iii. Mechanism of oxidative phosphorylation. **iv.** Inhibitors of ETC, Uncouplers	Brown adipose tissue metabolism.
08	**Carbohydrate- chemistry, digestion, absorption and metabolism 15 hrs** i. Definition, Classification, Biological importance of carbohydrates. Monosaccharides- Classification, importance, Structure and important properties. ii. Disaccharides - Structure and their importance iii. Homopolysaccharides - Structure and their importance	Glycosylated Hb & fructosamino albumin.

	iv. Heteropolysaccharides - Structure and their importance v. Digestion & absorption of carbohydrates. Disorders associated with transport of glucose across the cell membrane. vi. Glycolysis – pathway, rate limiting steps & regulation. vii. Glycolysis inhibitors, energetics, fate of pyruvate in aerobic and anaerobic conditions. viii. Production of acetyl CoA (PDH complex), Rappaport Leubering cycle and its significance. ix. Gluconeogenesis – pathway, key enzymes, regulation & Cori's cycle. x. Glylogen synthesis & Glycogen degradation. xi. Regulation of glycogen metabolism in brief & glycogen storage diseases. xii. HMP shunt pathway (second part of pathway is not to be emphasized), NADPH generation, transketolase and its significance, tissue where HMP pathway takes place, G6PD deficiency . xiii. Metabolism of fructose, galactose, uronic acid pathway, inborn errors associated. xiv. Blood glucose levels and its maintenance, mechanism of action of insulin, insulin receptor, insulin resistance, glucagon & growth hormone. xv. Diabetes mellitus, etiology, biochemical basis of symptoms and complications (microalbuminuria). **xvi.** Glucose tolerance test – different types, precautions, procedure, interpretation.	
09	**Lipids – Chemistry, digestion, absorption & metabolism** **14 hrs** i. Definition, classification and biological importance, structural and functional aspects of simple lipids. ii. Structural and functional aspects of compound lipids. iii. Derived lipids, Fatty acids - saturated, unsaturated. Steroids and their properties. Eicosanoids. iv. Digestion and absorption of lipids, role of bile salts and disorders. v. β -Oxidation of fatty acids, carnitine & regulation. α and ώ oxidation & its importance. vi. Denovo synthesis of fatty acids, regulation, elongation, desaturation. vii. Cholesterol – Chemistry, Synthesis, (up to mevalonate in detail & later on only crucial intermediates), regulation, transport, fate, formation of bile salts, fate of bile salts & other compounds derived from cholesterol (Steroid hormones). Isoprenoid units. viii. Blood levels of cholesterol, plasma lipoproteins, classification, transport, functions and its disorders. ix. Formation and utilization of ketone bodies, ketoacidosis (starvation, DM). x. Metabolism of adipose tissue, Triacylglycerols & its regulation, hormone sensitive lipase, fatty liver, lipotropic factors. xi. Functions of essential fatty acids and PUFA, prostaglandins, prostacyclins, thromboxanes and leukotrienes and their functions. xii. Phospholipids– formation, degradation & Glycolipids, Sphingolipids inborn errors associated with it.	Action of insulin, glucagon, GH, Liver-adipose tissue axis, post prandial and starvation states,
10	**Chemistry of proteins, digestion, absorption & metabolism**. **18 hrs**	Metabolic importance of Glutamic acid,

	i. Amino acids – definition, classification based on structure, nutritional requirement and metabolic fate. ii. Ionic properties of amino acids, isoelectric pH, buffering action of amino acids and proteins. iii. Structural organization of proteins – primary, secondary, tertiary & quaternary with suitable examples, forces involved in stabilization of their structure, biologically active peptides. iv. Classification based on their chemical nature and functions. Properties of proteins-denaturation, coagulation and flocculation. v. Plasma proteins, seperative techniques of plasma proteins, blood levels of plasma proteins. Albumin - functions & clinical aspects. vi. Transport proteins & acute phase proteins. vii. Immunoglobulins – Structure, types and functions, multiple myeloma, Bence Jones proteins. viii. Digestion and absorbtion of proteins and disorders. ix. General reactions of amino acids – decarboxylation, transamination deamination, transdeamination. x. Formation of ammonia, urea cycle and disorders. xi. Metabolism and importance of glycine. Inborn errors & formation of creatine. xii. Metabolism and importance of cysteine, methionine & transmethylation reactions. xiii. Urinary sulphur, cystinuria, homocystinuria & glutathione. xiv. Phenylalanine and tyrosine metabolism and its inborn errors. xv. VMA and its importance. xvi. Metabolim of tryptophan (only end products and PLP dependent reactions. xvii. Xanthuronic acid, Niacin synthesis in brief, serotonin, melatonin, indoxyl, Hartnup's disease. xviii. Importance of branched chain amino acids (metabolic pathway is not necessary), Maple syrup urine disease,	Glutamine, Aspartic acid, aspargine polyamines.
11	**Integration of metabolism and citric acid cycle**. **1 hrs** i. Citric acid cycle, reactions, energetics & regulation. ii. Amphibolic role, anaplerotic reactions & inhibitors	Integration of carbohydrates, lipids and protein metabolism.
12	**Molecular biology, molecular genetics and medical biotechnology**. **15 hrs** i. Structure of Purines, Pyrimidines, Nucleosides Nucleotides, function of nucleotides & biologically important nucleotides. ii. Sources of carbon & nitrogen for Purine synthesis (no detailed steps of synthesis, only crucial intermediates), PRPP synthesis and functions. Degradation of purines. Gout and hyperuricemia. Convertion of ribonucleotides to deoxyribonucleotides. iii Synthesis of pyrimidine, orotic aciduria (Degradation of pyrimidine is not required, only end products), Salvage pathway of purine and pyramidine & Lesch Nyhan syndrome. iv. Structure, properties and functions of DNA, different types of DNA, mitochondrial DNA, Base pairing rule, difference between DNA & RNA. v. RNA – types of RNA, their structure and functions. vi. DNA replication, DNA polymerase, regulation, DNA	Hybridoma technology & bioinformatics.

	repair mechanism and diseases associated inhibitors of DNA replication. vii. Transcription, RNA polymerase, post transcriptional modification, inhibitors, reverse transcriptase, introns and exons, ribozymes. viii. Genetic code, tRNA and ribosomes. ix. Translation, post translational modification & inhibitors of protein biosynthesis. x. Genome and its organization, Gene expression, regulation of gene expression (lac operon concept), repression, derepression, induction & mutations. xi. Recombinant DNA technology, Restriction endonuclease, Gene library, Gene therapy. **xii.** DNA hybridization techniques – Southern blot, northern blot, Western blot, PCR, reverse PCR, RFLP,	
13	**Hemoglobin Chemistry and Metabolism**. **4 hrs** i. Porphyrins, heme & other heme containing proteins. ii. Biosynthesis of heme, regulation, porphyrias and laboratory diagnosis. iii. Brief chemistry, structure & normal variants of Hb. Degradation of hemoglobin & metabolism of bile pigments. iv. Jaundice - Classification, causes – congenital and acquired, investigation in blood and urine. **v.** Abnormal hemoglobin, hemoglobinopathies, thalassemia	Anemia.
14	**Organ function tests**. 3 **hrs** i. LFT ii. KFT iii. Thyroid function tests	GFT
15	**Acid base balance and its disorders 3 hrs** i. Acids and bases of the body, mechanism of pH regulation, body buffers, Respiratory and renal mechanism. ii. Acidosis, anion gap, alkalosis, assessment of acid base status	ABG analysis and interpretation.
16	**Water and electrolyte balance and its disorders**. 1 **hr**	Water intoxication
17	**Detoxification mechanism and metabolism of xenobiotics, 1hrs**	Entoxification.
18	**Mineral metabolism.** 5 **hrs** Sources, dietary requirements, absorption, transport, fate, metabolism, functions, excretion, deficiency manifestations of the following. i. Calcium, phosphorus ii. Iron, Copper, magnesium iii. Iodine, Fluoride iv. Zinc, manganese, selenium, chromium	Toxicity of heavy metals – Cadmium, Arsenic, Nickel, Mercury & lead.
19	**Nutrition and energy metabolism & Diet planning**. 5 **hrs** i. Caloric value of food, RQ, BMR and its clinical significance,	TPN (Total parenteral nutrition) Diet planning in health and diseases. Toxic

	specific dynamic action of food, energy allowances based on age, sex and physical activities. ii. Nitrogen balance, protein quality, biological value of protein, nutritional value and protein requirement. iii. Balanced diet, proximate principles of diet and their relative proportions. iv. PEM – Kwashiorkar, Marasmus & Malabsorption syndrome. **iv.** Biochemistry of starvation, obesity, dietary fibers,	substances in food (natural, additives).
20	**20. Biochemistry of cancer 1 hr** i. Aetiology – chemical carcinogens,Oncogenic virus, oncogenes, Anti–oncogenes, suppressor genes, Growth factors, tumour markers.	Apoptosis
21	**21) Biochemistry of AIDS 1 hr** Transmission, natural course of disease, laboratory analysis,	Anti – HIV drugs & prevention.
22	**Tissue proteins in Health and disease** 3 **hrs** i. Collagen synthesis, structure, functions and abnormalities. ii. Elastin, Keratin, contractile proteins - Actin, myosin, troponins & neurotransmitters.	Diseases due to abnormal protein structure – Prion diseases, lens proteins (Cataract). Biochemistry of ageing, Alzheimers disease.
23	**Hormones 1 hr** i) Mechanism of action of peptide and steroid hormones (insulin, Glucagon, Epinephrine and steroids.	Structure and functions of hormones
24	**Biochemical aspects of atherosclerosis and biochemical markers of MI 1 hr** i. Biochemistry of Atherosclerosis, lipid profile, apoproteins, Lp(a) homocysteine & C – reactive protein. ii. Biochemical markers of MI- LDH, CPK–MB, Myoglobin, troponin, SGOT.	Newer cardiac biomarkers.
25	**SI units & Quality control 1 hr** i. SI units, Quality control-definition, collection of samples, Transport of samples. Limit of errors allowable in lab.	External Quality control programme
26	**Biomedical waste management 1 hr**	Collection, handling, transport and disposal of BMW, functioning of incinerator

PRACTICALS

PART – I Qualitative Experiments 40 X 2= 80 Hours

a) Reactions of Monosaccharide - Glucose and Fructose.
b) Reactions of Disaccharides – Lactose, Maltose & Sucrose.
c) Reactions of Polysaccharides – Starch.
d) Identification of unknown carbohydrate.
e) Precipitation and coagulation reactions of proteins

f) Colour reactions of proteins
g) Tests for albumin and casein.
h) Identification of unknown protein.
i) Identification of Biochemically important substances.
j) Normal constituents of urine and physical characteristics.
   a) Organic: Urea, Uric Acid and Creatinine.
   b) Inorganic: Ca, P, Cl, SO_4, and NH_3.
k) Analysis of abnormal constituents of urine.

PART - II Quantitative Experiments

a) Estimation of blood glucose and interpretation.
b) Estimation of blood urea and interpretation.
c) Estimation of serum inorganic phosphorus and interpretation.
d) Estimation of total serum proteins, Albumin and A: G ratio.
e) Estimation of serum creatinine and interpretation.

PART – III Demonstrations

a) Colorimetry.
b) Paper electrophoresis.
c) Paper Chromatography.
d) Flame photometer
e) Glucose tolerance test.
f) Determination of AST (SGOT) and ALT (SGPT) and interpretation
g) Determination of serum cholesterol (enzymatic method) and interpretation
h) Determination of ascorbic acid and interpretation
i) Determination of glucose, proteins and chloride in CSF and interpretation
j) Determination of albumin in urine and test for Bence Jones proteins in urine and interpretation.
k) Spectroscopic examination of Hemoglobin derivatives and preparation of hemin crystals.
l) Spot test for PKU, Alkaptonuria and Homocysteinuria.
m) Determination of Calcium and interpretation.
n) Determination of serum bilirubin and interpretation
o) Determination of serum amylase and interpretation
p) Determination of serum uric acid and interpretation
q) Determination of serum alkaline phosphatase and interpretation
r) Spotters.
s) Interpretation of charts, graphs and case reports.

SCHEME OF EXAMINATION:

Internal Assessment: Total – 40 (Theory 30, Practical 10 marks)

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Theory 30 Marks:

There should be regular formative assessment. Day to day performance should be given greater significance. Minimum of three sessional examinations are to be conducted. The

sessional examination preceding the university examination may be similar to the pattern of university examination.

Average of any two best marks obtained in the theory I A examinations will be taken into consideration for calculating Internal assessment. 20% of weightage will be given to day to day assessment (Performance in monthly tests, participation in seminars and research work, MCQ, Home assignment, structured Viva-voce Integrated teaching programme etc). Average of best two I A marks and marks obtained for day to day assessment will be added and the sum of these two shall be sent to the University. One of the three sessional examinations will be of MCQ type (preferably II I A)

Practical 10 Marks:

There will be three sessional practical examinations. 20% of weightage will be given to day to day assessment. Average of best two practical I A marks will be reduced to 07 and marks obtained for practical records and performance in periodic practical tests, OSPE will be reduced 03. Average of best two I A marks and marks obtained for day to day assessment will be added and sum of these shall be sent to the university. One of the three sessional examinations will be of OSPE type. (Preferably II I A)

The Internal assessment marks should be displayed on the notice board. The individual student's signature should be taken against the marks obtained.

The Internal assessment marks both theory & practical obtained by the candidates should be sent to the university at least 15 days prior to the commencement of university theory examination.

Student should be shown evaluated answer script. The individual student's signature has to be taken on the answer scripts.

UNIVERSITY EXAMINATION.

Theory: 100 Marks.

There shall be two papers, The total marks will be 100. The total duration of the paper will be 3 hrs. There shall be 4 types of questions.

Types of question & distribution of marks:

Topics	**Type of questions**	**No of Que & Marks**
Paper I	Long essay	2 x 10 = 20
	Short essay	3 x 5 = 15
	Short answer	5 x 3 = 15
Paper II	Long essay	2 x 10 = 20
	Short essay	3 x 5 = 15
	Short answer	5 x 3 = 15

Distribution of topics for each paper & weithage of marks in university examination.

Paper I

Topics	**Weightage of marks**
1. Cell & sub cellular structures	5 Marks
2. Acids, bases, pH, Buffer, Henderson Hasselbalch equation.	5 Marks
3. Radioactive isotopes & their application in Medicine	5 Marks
4. Enzymes	10 Marks
5. Vitamins	10 Marks
6. Bioenergetics & Biological oxidation	10 Marks
7. Carbohydrate- chemistry, digestion, absorption & metabolism	10 Marks
8. Lipids- chemistry, digestion, absorption & metabolism	10 Marks
9. Protein- chemistry, digestion, absorption & metabolism.	10 Marks

Paper II

Topics	**Weightage of marks**
1. Integration of metabolism	10 Marks

and citric acid cycle

2. Molecular Biology, Molecular Genetics, Medical Biotechnology	10 Marks
3. Haemoglobin chemistry and metabolism	10 Marks
4. Organ function tests - LFT, KFT & Thyroid Function tests.	05 Marks
5. Acid base balance & its disorders	10 Marks
6. Water & electrolyte balance & its disorders.	05 Marks
7. Detoxification mechanism, metabolism of xenobiotics, Entoxification	05 Marks
8. Mineral Metabolism	10 Marks
9. Nutrition & Energy metabolism and Diet planning	10 Marks
10. Biochemistry of Cancer	05 Marks
11. Biochemistry of AIDS	05 Marks
12. Tissue proteins in Health & disease.	05 Marks
13. Mechanism of action of Hormones	05 Marks
14. Biochemical aspects of atherosclerosis & Biochemical markers of MI	05 Marks
15. SI units & quality control	05 Marks
16. Biomedical waste management	05 Marks

Note: 1) Long essay questions may be asked from topics with weithage of 10 marks.
2) Short essay questions may be asked from any of the topics.
3) Short answer questions may be set from all the chapters (except the chapter on which long essay and short essay questions have been set).
4) **The topic assigned to the different papers are generally evaluated under those sections. However a strict division of the subject may not be possible and some overlapping of topics is inevitable. Students should be prepared to answer overlapping topics.**

UNIVERSITY PRACTICAL EXAMINATION

Practical: 40 Marks

The practical examination consists of two exercises I & II, each of one hour duration and each exercise carries 20 marks.

Exercise I: 20 Marks

1) Quantitative estimation – Every candidate shall perform one given procedure.
a) Principle and procedure for the estimation asked in the question should be written by the candidate in first five minutes.

5 Marks.

b) After collecting the papers, correct procedure for the estimation is given and practical examination is done. Total marks would be 15 and the distribution of marks would be:

i) Results (values), Calculations and reporting. 5 Marks

iii) For interpretation of results and application of the estimation. 5 Marks

c) Case studies and discussion. 1X5=5 Marks.

Exercise II : 20 Marks

2) Qualitative analysis – Every candidate shall perform one given procedure such as – identification of carbohydrates, proteins, substances of Biochemical importance, analysis of normal and abnormal constituents of urine.

i) For selection of appropriate reactions 5 Marks

ii) For reasoning of analysis and correct reporting 5 Marks.

iii) For interpretation of results 5 Marks.

3) Five spotters including Biochemical techniques, instruments, crystals, biochemical tests and reagents. 1X5= 5 Marks.

c) Viva-Voce: 20 Marks

The viva voce examination shall carry 20 marks and all the four examiners will conduct the viva examination. The distribution of topics for each examiner is as under.

VIVA-VOCE ASSESSMENT PROGRAMME.

Group-I (05)	Cell & subcelleular structures, Carbohydrates – Chemistry, Classification, Digestion, Absorption and Metabolism, Biochemistry of cancer & AIDS, Radio isotopes, Integration of Metabolism & citric acid cycle.
Group-II (05)	Proteins-Chemistry, Classification, Digestion, Absorption & Metabolism, Enzymes and Clinical enzymology, Detoxification, SI units & Quality control.

Group-III (05)	Lipids –Chemistry, Classification, Digestion, Absorption, and Metabolism. Nucleic acids, Purine & Pyrimidine metabolism, Molecular Genetics, Biological oxidation, Biochemical aspects of atherosclerosis & markers of MI.
Group-IV (05)	Vitamins, Minerals, Organ function tests (Liver, Kidney, Thyroid), Diet planning, Nutrition and Energy metabolism in health and diseases. Heme metabolism. Water, electrolyte & acid base balance & its disorders. Tissue proteins in health & diseases, Mechanism of action of peptide and steroid hormones, Biomedical waste management.

Note: Applied Biochemistry questions may be asked by all the 4 examiners in the respective subject.

SUGGESTED BOOKS IN BIOCHEMISTRY: (LATEST EDITION)

Deciding which text book to buy is not an easy task. Choice of the text book depends on the individual and his or her aptitude. It is desirable, and would certainly be helpful if each student has one text book out of the recommended list of text books

RECOMMENDED BOOKS FOR THEORY

1. Textbook of Biochemistry by D.M.Vasudevan & Sreekumari.S.
2. Medical Biochemistry by Dinesh Puri.
3. Textbook of Biochemistry by Debajyoti Das
4. Textbook of Biochemistry by U.Satyanarayan & U. Chakrapani.
5. Textbook of Biochemistry Pankaja Naik.

RECOMMENDED BOOKS FOR PRACTICALS

1. Manipal manual of Clinical Biochemistry by Shivanand Nayak.
2. Laboratory Manual in Biochemistry by T.N.Pattabhiraman.

REFERENCE BOOKS

1. Harper's Review of Biochemistry
2. Practical in Clinical Biochemistry by Nath & Nath.

INTRODUCTION TO HUMANITIES AND COMMUNITY MEDICINE PHASE – I (TERM I & II)

Including Introduction to the subjects of Demography, Health Economics, Medical Sociology, Hospital Management. Behavioural Sciences inclusive of Psychology.

OBJECTIVES:

a) **KNOWLEDGE:**

The student shall be able to :

1) explain the principles of sociology including demographic population dynamics;
2) identify social factors related to health, disease and disability in the context of urban and rural societies ;
3) appreciate the impact of urbanization on health and disease;
4) observe and interpret the dynamics of community behaviour;
5) describe the elements of normal psychology and social psychology;
6) observe the principles of practice of medicine in hospital and community setting.

b) **SKILLS:**

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

1) Principles of practice of medicine in hospital and community settings and familiarization with elementary nursing practices.
2) Art of communication with patients including history taking and medico social work.

Teaching of community medicine shall be both theoretical as well as practical. The practical aspects of the training programme shall include visits to the health establishments and to the community where health intervention programmes are in operation.

In order to inculcate in the minds of the students the basic concept of community medicine to be introduced in this phase of training, it is suggested that the

detailed curriculum drawn shall include at least 30 hours of lectures, demonstrations, seminars etc. together with at least 15 visits of two hours each.

Phase – I (Term I & II)

Teaching Hours : 60 – Theory 30 Hours

Field visit 15 each of 2 Hours.

Sl. No.	Topic	No. of Hours.
1.	Introduction to Community Medicine, Evolution of Community Medicine, Indian Systems of Medicine	02
2.	The Study of Family	02
3.	Community Study – Rural, Urban Communities-features, health hazards	02
4.	Environment and sustainable development	04
5.	Social factors in health and disease. Medico Social Worker, Doctor-patient relationship.	08
6.	Introduction to Bio-Statistics	08
7.	Demography and Family Welfare (including integrated teaching along with Anatomy, Physiology & Obst. & Gynecology.	04
	Total	30 Hours.

<u>15 FIELD VISIT OF 2 HOURS EACH</u>

Mandatory to expose the students to –

1. Urban, Rural & Slum communities to understand social, economical, Physiological, Environmental factors and their role on the health of the people.

2. Health care facilities available and the services provided there.

SECTION - IV

MEDICAL ETHICS

INTRODUCTION

Medical ethics is a systematic effort to work within the ethos of medicine, which has traditionally been service to sick.

There is now a shift from the traditional individual patient, doctor relationship, and medical care. With the advances in science and technology and the needs of patient, their families and the community, there is an increased concern with the health of society. There is a shift to greater accountability to the society. Doctor and health professionals are confronted with many ethical problems. It is, therefore necessary to be prepared to deal with these problems.

In keeping with its goal to improve quality of education, BLDE University, recommends introduction of medical ethics in the regular teaching of M.B.B.S. course beginning from first year and containing till internship.

OBJECTIVES

The objectives of teaching medical ethics should be to enable to students develop the ability to:

1. Identify underlying ethical issues and problems in medical practice.
2. Consider the alternatives under the given circumstances, and
3. make decisions based on acceptable moral concepts and also traditions practices.

COURSE CONTENTS (SYLLABUS)

1. Introduction to Medical Ethics

   What is Ethics
   What are values and norms
   Relationship between being ethical and human fulfillment.
   How to form a value system in one's personal and professional life
   Heteronomous Ethics and Autonomous Ethics\
   Freedom and personal Responsibility

2. Definition of Medical Ethics

   Difference between medical ethics and bio-ethics
   Major Principles of Medical Ethics

Beneficence	=	fraternity
Justice	=	equality
Self determination (autonomy)	=	liberty

3. Perspective of Medical Ethics

   The Hippocratic oath
   The Declaration of Helsinki
   The WHO Declaration of Geneva
   International code of Medical Ethics (1993)
   Medical Council of India Code of Ethics (2002)

4. Ethics of the Individual

   The patient as a person
   The Right to be respected
   Truth and Confidentiality
   The autonomy of decision
   The concept of disease, health and healing
   The Right to health
   Ethics of Behaviour modification
   The Physician – Patient relationship
   Organ donation

5. The Ethics of Human life

   What is human life
   Criteria for distinguishing the human and the non-human
   Reasons for respecting human life
   The beginning of human life
   The beginning of human life
   Conception, contraception
   Abortion
   Prenatal sex-determination
   In vitro fertilization (IVF), Artificial Insemination by Husband (AIH)
   Artificial Insemination by Donor (AID0,
   Surrogate motherhood, Semen Intrafallopian Transfer (SIFT),
   Gamete Intrafallopian Transfer (GIFT), Zygote Intra fallopian Transfer (ZIFT),
   Genetic Engineering.

6. The Family and Society in Medical Ethics

   The Ethics of human sexuality
   Family Planning perspectives
   Prolongation of life
   Advanced life directives – The Living Will
   Euthanasia
   Cancer and Terminal Care

7. Death and Dying

   Use of life-support systems
   Death awareness
   The moment of death
   Prolongation of life
   Ordinary and extraordinary life support
   Advanced life directives
   Euthanasia – passive and active
   Suicide – the ethical outlook
   The right to die with dignity

8. Profession Ethics

   Code of conduct
   Contract and confidentiality
   Charging of fees, Fee-splitting

Prescription of drugs
Over-investigating the patient
Low-Cost drugs, vitamins and tonics
Allocation of resources in health cares
Malpractice and Negligence

9. Research Ethics

Animal and experimental research / humanness
Human experimentation
Human volunteer research – Informed consent
Drug trials

10. Ethical workup of cases

Gathering all scientific factors
Gathering all human factors
Gathering all value factors
Identifying areas of value-conflict, Setting of priorities,
Working our criteria towards decisions

4. TEACHING / LEARNING EXPERIENCE

Classroom teaching would focus on professional relationship, patient-doctor relationship, issues at the beginning and end of life, reproductive technologies, resource allocation and health policy. It will also deal with values, ethical concepts and principles.

Clinical ethics must be taught as part of bedside teaching group discussions, case studies, problem analyzing and problem solving exercises may also be employed.

Demonstrating by example, how to identify and resolve a particular problem

Increasing the awareness and knowledge of students of the value dimensions of interactions with the patients, colleagues, relations and public.

Fostering the development of skills of analysis, decision making and judgment.

Making the students aware of the need to respect the rights of the patient as also duties and responsibilities of the doctor.

Recommended distribution of Teaching hours in different phases of MBBS Course

Total Teaching Hours : 40

Phase I : Preclinical Period – 6 hours
2 hours each by Anatomy, Physiology, Biochemistry during 1 year.

Phase II : Paraclinical Period - 6 hours
2 hours each from Pharmacology, Pathology and Micribiology.

Phase III : Community Medicine – 4 hours

2 hours each from Ophthalmology and ENT – 4 hours.
2 hours each in two terms from Medicine, Surgery, and OBG = 12 hours
8 hours from other clinical departments.

N.B.: The teaching of Medical Jurisprudence by the department of Forensic Medicine will continue as before.

5. EVALUATION

At least one short answer question may be asked on medical ethics appropriate to the subject in all major subjects in the university question paper. A few questions may be asked during viva voca examination.

6. RECOMMENDED READING

1. Francis C. M., Medical Ethics, 2nd Edn, 2004, Jaypee Brothers, New Delhi, Rs. 25/-
2. Ethical Guidelines for Biomedical Research on Human Subjects, Indian Council of Medical Research, New Delhi, 2000.

SECTION - V

ANNEXURE - I

Different Methods Recommended for Internal Assessment by MCI

The Medical Council of India has given some examples of methods for internal assessment of student, which may be followed by the colleges.

They are :

1. Credit for preparation and presentation of seminars by students
2. Preparation of clinical case for presentation.
3. Clinical case study / problems solving exercises.
4. Participation in project for health care in the community
5. Proficiency in conducting a small research project or assignment.
6. Multiple choice questions (MCQ) test after completion of a chapter / system. Each item shall be objectively assessed and recorded. Some of the items can be assigned as homework/vacation work.

ANNEXURE - II

Coordinated Programme in Theory for MBBS Phase – I of One Year Course in Anatomy, Physiology and Biochemistry

I term

Month	Anatomy	Physiology	Biochemistry	Integrated teaching
1	General Anatomy General Embryology General Histology General Human Genetics	General Physiology Cell membrane, Transport Homeostasis Body fluids Biophysical principles	Cell structure Sub-cellular Components Biophysial Principles PH, buffers Biochemistry of nucleic acids	
2	Osteology Myology Arthrology	Haematology Muscle physiology	Classification sources & functions of proteins, carbohydrate & lipids	Anatomy+ Physiology+ Biochemistry+ Pathology
3 & 4	Heart, Blood vessels, Lungs Pleura Systemic embryology	Cardiovascular System Respiratory System	Plasma proteins Protein synthesis Diagnostic Enzymology	
5 & 6	Abdomen, Digestive And Genitourinary Organswith Systemic embryology	Digestive system, secretion and motiligy	Digestive enzymes Vitamis, Digestion and absorption of food	

II term

Month	Anatomy	Physiology	Biochemistry	Integrated Teaching
	Pelvis	Renal and reproductive Physiology	Liver function, detoxification, renal function, gastric function	
7 & 8	Neuro anatomy Special senses Neural development	Nervous system Special senses Autonomic Nervous System Endocrine Glands	Metabolism of carbohydrates, Amino acids, Protein, fats, minerals, water.	Endocrine And exocrine pancreas (Diabetes Mellitus) Anatomy+ Physiology+ Biochemistry
9 & 10	Brain, Cerebral cortex, Ventricular system, Brain coverings, Limbic system	Higher functions Emotion, behaviors	Neurotransmitter, Radio Isotopes, Biological, Oxidation, Electron transfer cycle	CSF Anatomy+ Physiology+ Biochemistry

Coordinated Programme for Dissection / Practical / Demonstration

I term

Month	Anatomy	Physiology	Biochemistry
1	Upper limb dissection Prosected part, Histology tissues Muscles, Bone marrow	Osmotic effect Osmotic hemolysis of RBC, ESR. Principles of hemocytometry	Viscosity, Principles of colourimetry PH – meter Spectometry Sp. Gravity of body fluids
2	Lower limb dissection Prosected part Histology – bone connection Tissue Embryology	Heamatology experiments Muscle experiments	Biochemistry test for Carbohydrate, Proteins, Fats, Minerals.
3	Thorax Abdomen Embryology model	Spirometry Stethography Artificial respiration FEV, Breath sounds	

II term

Month	Anatomy	Physiology	Biochemistry
5 & 6	Thorax Abdomen Pelvis Embryology model	Arterial pulse Venous pulse Blood Pressure, ECG (Demon) Echocardiography (Demon) Stress test Heart sounds	Urine examination Liver function test Renal clearance test
7 & 8	Head and Neck	Clinical examination of : • Cranial nerves • Sensory function • Motor function	Glucose Tolerance Test; Blood Glucose Estimation Chemistry of food Chemistry of milk
9 & 10	Brain	Examiantion of higher functions, reflexes.	CSF Analysis

Urine: Physical and Chemical
Estimation of Glucose in blood and urine G.T.T

ANNEXURE - III

List of Topics for Integrated Teaching Programme During MBBS Phase – I course

Sl. No.	Topics	Department to organize	Departments to participate
1	***Cell Membrane***: Structure (Anat), function(Bioc) and transport across the cell membrane (Phy)	Biochemistry	Anatomy, Physiology, & Biochemistry
2	***Anaemia*:** Pathophysiology (Patho), Investigation & treatment (Med) & Public health importance (Comm Med)	Physiology	Physiology, Biochemistry, Pathology & community Medicine
3	***Human Genetics:*** Anatomic considerations(Anat), applied aspects (Surgery & Paed)	Anatomy	Anatomy, Physiology, Biochemistry, Surgery & Pediatrics.
4	***Acid base balance*** General considerations (Bioc), Acid Base balance (Phys) & disorders & Treatment (Med).	Physiology	Physiology, Biochemistry, Medicine
5	***Acid Peptic disease*:** Anatomy of stomach(Anat), Functional aspects of stomach (Phy), Pathophysiology of Acid Peptic disease (Path), Medical Management of acid peptic disease (Med), Surgical Management of acid peptic disease (Surg)	Anatomy	Anatomy, Physiology, Pathology, Medicine & Surgery.
6	***Liver*:** Structure of Liver (Anat), functional aspect of liver (Phys), Biochemical aspect of liver (Bioch)	Anatomy	Anatomy, Physiology, Biochemistry.
7	***Myocardial infarction*:** Anatomy of coronary arteries (Ana), physiological aspects of coronary blood flfow (Phy), Pathophysiology of CAD (Pathology), Biochemical markers in CAD (Bioch), Medical management of CAD (Med), surgical management of CAD (Surg).	Physiology	Anatomy, Physiology, Pathology, Biochemistry, Medicine, & Surgery.
8	***Parkinsonism*:** Anatomy of Basal Ganglia (anat), Physiology of BG (Phys), clinical features, investigations & treatment (Med)	Anatomy	Anatomy, Physiology, Medicine.

ANNEXURE - IV

CATEGORIES OF BIO-MEDICAL WASTE
SCHEDULE-I
(See Rule 5)

**Waste Category No.	Waste Category ** Type	Treatment & Disposal ** Options
Category No.1	**Human Anatomical Waste** (human tissues, organs body parts)	Incineration[o]/ deep burial*
Category No.2	**Animal waste** (animal tissues, organs, body parts, carcasses, bleeding parts, fluid, blood and experimental animals used in research, waste generated by veterinary hospitals, colleges discharge from hospitals, animal houses)	Incineratin [o]/ deep burial*
Category No.3	**Microbiology & biotechnology Waste** (wastes from laboratory cultures, stocks or specimens of micro-organisms live or attenuated vaccines human and animal cell culture used in research and infectious agents from research and industrial laboratories, wastes from production of biologicals, toxins, dishes and devices used for transfer of cultures.)	Local autoclaving/micro-waving/incineration [o]
Category No.4	**Waste sharps** (needles, syringes, scalpels, blades, glass etc., that may cause puncture and cuts. This includes both used and unused sharps)	Disinfection (Chemical treatment [oo]/auto-claving / micro-waving and mutilation / shredding[aa]
Category No.5	**Discarded Medicines and Cytotoxic drugs** (waste comprising of outdated, contaminated and discarded medicines)	Incineration [o]/destruction and drugs disposal in secured landfills
Category No.6	****Soiled Waste** (items contaminated with blood and body fluids including cotton, dressings, soiled plaster casts, liners, beddings, other material contaminated with blood)	Incineration [o] autoclaving/micro-waving
Category No.7	**Solid Waste** (waste generated from disposable items other than the waste**sharps such as tubings, catheters, intravenous sets, etc.)	Disinfection by chemical treatment [oo] autoclaving/micro-waving and mutilation/shredding[aa]
Category No.8	**Liquid Waste** (waste generated from laboratory and washing, cleaning, housekeeping and disinfecting activities	Disinfection by chemical treatment[oo] and discharge into drains

Category No.9	**Incineration Ash** (ash from incineration of any bio-medical waste)	Disposal in municipal landfill
Category No. 10	**Chemical Waste** (chemicals used in production of biologicals, chemicals used in disinfectin as insecticides etc.,)	Chemical treatment[oo] and discharge into drains for liquieds and secured landfill for solids

** As per Bio-Medical Waste (Management & Handling) (Second Amendment) Rules, 2000, dated 2nd June, 2000.

oo Chemicals treatment using at least 1% hypochlorite solution or any other equivalent chemical reagent. It must be ensured that chemical treatment ensures disinfection.

aa Mutilation/shredding must be such so as to prevent unauthorized reuse.

o There will be no chemical pretreatment before incineration. Chlorinated plastics shasll not be incinerated.

* Deep burial shall be an option available only in towns with population less than five lakhs and in rural areas.

COLOUR CODING AND TYPE OF CONTAINER FOR DISPOSAL OF BIO-MEDICAL WASTES

SCHEDULE – II

(See Rule 5)

Colour Coding	Type of Container	Waste Category	Treatment Options as per Schedule-I
Yellow	Plastic bag	Cat. 1, Cat.2, Cat.3, Cat.6.	Incineration/deep burial
Red	Disinfected container/plastic bag	Cat.3, Cat.6, Cat.7.	Autoclaving/Micro-waving chemical Treatment.
Blue/White Translucent	Plastic bag/puncture proof container	Cat.4, Cat.7.	Auto claving/Micro-waving/Chemical Treatment and destruction/shredding
Black	Plastic Bag	Cat.5, and Cat.9 and Cat.10 (solid)	Disposal in secured landfill

Notes:

1. Colour coding of waste categories with multiple treatment options as defined in Schedule-I shall be selected depending on treatment option chosen, which shall be as specified in Schedule-I
2. Waste collection bags for waste types needing incineration shall not be made of chlorinated plastics.
3. Categories 8 and 10 (liquid) do not require containers/bags.
4. Categories 3 if disinfected locally need not be put in containers/bags.

BLDE UNIVERSITY

Ordinance Governing M.B.B.S. Degree Course Curriculum

(Revised Curriculum 2012 Batch onwards)

Phase II : Para-Clinical Subjects

Published by

B.L.D.E. UNIVERSITY

(Declared as Deemed to be University u/s 3 of UGC act, 1956, vide notification No.F.9-37/2007-U.3 (A) dated 29-2-2008, of the MHRD, Government of India)

The Constituent College

SHRI B. M. PATIL
MEDICAL COLLEGE, HOSPITAL AND RESEARCH CENTRE
Smt. Bangaramma Sajjan Campus, Sholapur Road, Bijapur – 586103, Karnataka, India
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B.L.D.E. UNIVERSITY

(Declared vide notification No. F.9-37/2007-U.3 (A) Dated. 29-2-2008 of the MHRD, Government of India under Section 3 of the UGC Act,1956)

The Constituent College

SHRI. B. M. PATIL MEDICAL COLLEGE, HOSPITAL AND RESEARCH CENTRE

BLDEU/REG/GEN/2012-13/ 845 September 20, 2012

NOTIFICATION

Sub: Revised Curriculum for the MBBS Degree – 2012

Ref: 1. Medical Council of India Regulation on Graduate Medical Education, 1997 and subsequent amendments of the same from time-to-time.
2. Minutes of the meeting of the Academic Council of the University held on April 11, 2012.
3. Minutes of the meeting of the BOM of the University held on May 23, 2012.

The Board of the Management of University is pleased to approve the curriculum for MBBS Degree course at its meeting held on May 23, 2012.

The revised curriculum shall be effective from the Academic Session 2012-13 onwards, for MBBS degree course in the constituent College of the University viz Shri. B. M. Patil Medical College Hospital and Research Centre from the academic session 2012-13 onwards.

REGISTRAR
REGISTRAR.
BLDE University, Bijapur.

To,
The Dean, FoM & Principal
BLDE University's
Shri. B. M. Patil Medical College, Hospital and Research Centre,
BIJAPUR.

Copy to:
1. Secretary UGC New Delhi.
2. Controller of Examinations, BLDE University, Bijapur.
3. Prof. & HOD's Pre Para & Clinical departments.
4. PS to Hon'ble President, BLDE University.
5. PS to Hon'ble Vice Chancellor, BLDE University.
6. Office Copy

Smt. Bangaramma Sajjan Campus, Sholapur Road, Bijapur – 586103, Karnataka, India.
University: Phone: +918352-262770, Fax: +918352-263303 , Website: www.bldeuniversity.org, E-mail: office@bldeuniversity.org
College: Phone: +918352-262770, Fax: +918352-263019, Website: www.bldea.org, E-mail: bmpmc1@yahoo.co.in

BLDE UNIVERSITY

Vision and Mission

- *Committed to provide globally competitive quality medical education.*
- *To provide the best health care facilities in this backward region, in particular, to socially disadvantaged sections of the society.*
- *Constantly striving to become a reputed research University with world-class infrastructure, latest tech-tools for teaching/research and adopting global best practices.*

Objectives

- To provide for instruction and training in such branches of learning as it may deem fit.
- To provide for research and for the advancement of and dissemination of knowledge.
- To undertake extramural studies, extension programmes and field outreach activities to contribute to the development of society.
- To do all such other acts and things as may be necessary or desirable to further the objects of the Institute.
- To provide education in medical and health sciences or any other branches that will imbibe humane qualities in our students in order to enable them to practice medical and health care prudently and equitably.
- To endeavor to improve quality of undergraduate and postgraduate education by providing necessary infrastructure and learning resources required.
- To encourage use of learner oriented methods that would cultivate logical thinking, clarity of expression, independence of judgment, scientific habits, problem solving abilities, self initiated self directed and life learning.
- To encourage innovations in education, teaching methods, student assessment and in extension service.
- To provide educational experience that allow hands-on- experience both in institutional as well as in community setting.
- To encourage development of scientific temper, acquire educational experience for proficiency in profession and promote healthy living.
- To constantly display sensitivity and respond to changing educational, social, and community needs.

- To enable students to become exemplary citizens by observation of moral and ethical code of conduct and fulfilling social and professional needs as to respond to national aspirations.
- To plan and implement transparency and accountability in governance of academic and administrative activities.
- To promote staff student welfare programmes.
- To promote public private partnership in various fields including health care.
- To provide for interaction in training and research programs with concerned National or International institutes such as University / Board / R & D Organizations / Centers of excellence such as ICMR, AIIMS, NIMHANS, etc.,
- To introduce the short-term courses for award of PG Diploma and certificates in the University.
- To evolve distance education programs or modularly designed programs leading to degrees that can be awarded on a credit-accumulation basis in the Deemed University system.
- To create an academic and administrative structure in tune with the changing needs of the society, so as to enable the growth of each institution of the University into a center of excellence.
- To promote and sustain international collaborations with institutions, including twinning programs and award of degrees/diplomas.
- To bring in all aspects of creative human activities in medical and allied sciences such as art.
- To organize and promote conferences, seminars, lectures, public debates and exhibitions in matters relating to education.
- To give awards, prizes and scholarships to promote the objectives
- To form centers at convenient places and promote the objectives
- To promote education research, training and professional development in medical, Bio-medical or any other branches of education.
- To collaborate with individuals or universities outside India for the purpose of research, education and extension of knowledge.
- To assist the Government in the formation and implementation of policies relating to health promotion.
- To promote educational activities in habitat related environmental issues such as human waste management, hospital and other medical waste management.
- To promote educational activities in habitat related environmental issues such as pollution, energy and conservation.

Introduction

The revised M.B.B.S curriculum of The Medical Council of India (MCI) came into effect from May 1997 and it has undergone amendments thereof. The BLDE University has implemented the new regulations for the batches of students admitted to the M.B.B.S course from the academic year 2008-09 and onwards.

University will implement the revised curriculum for the batches of students admitted to the M.B.B.S Course from the academic year 2012-13 onwards.

These regulations recommend the following:

1) That the medical curriculum should be oriented towards educating students to take up the responsibilities of physicians of first contact. The medical graduate should be capable of functioning independently in both urban and rural environment of our country and internationally.

2) Every effort should be made to provide educational experience that allows hands-on-experience both in hospital as well as in community setting. For this purpose, a comprehensive list of clinical skills that a graduate must acquire at the end of the course including internship has been prepared.

3) That maximum effort is made to encourage integrated teaching and every attempt be made to de-emphasise compartmentalization of disciplines so as to achieve horizontal and vertical integration in different phases.

4) That educational experience should emphasise health rather than only disease, and community orientation also instead of only hospital orientation. Population control and family planning should also be given due emphasis.

5) Due importance to be given to teaching common problems of health and disease and to the national programmes.

6) That every effort should be made to use learner oriented methods which would encourage cultivation of logical thinking, clarity of expression, independence of judgment, scientific habits, problem solving abilities, and self-directed learning.

7) Reduction of "didactic lectures (not more than 1/3 of total teaching hours) and increasing use of active methods of learning such as group discussion seminars, role play, field visits, demonstrations, peer interactions etc. which would enable students to develop personality, communication skills and other qualities which are necessary.

8) Examinations be designed with a view to assess not merely the knowledge but also practical and clinical skills, habits and values which are necessary for a graduate to carry out professional day to day work competently.

9) Regular periodic assessment to be done throughout the course for internal assessment. The assessment need not be limited to written tests. It should relate to other items such as maintenance of records, participation in seminars and group discussions, clinical case study, proficiency in carrying out practical or clinical skill or participation in projects and assignments (even) during vacation. These be evaluated objectively and recorded.

10) That every medical institution should evolve institutional objectives, which would be in consonance with the national goals (See Section II) and health policy. The institutional objectives should describe the attributes of their product.

11) Shift in the role of medical teachers from mere imparting knowledge to that of a facilitator and motivator of student learning.

12) That every medical college establishes a medical education unit for faculty development, preparation of learning resource materials and improved evaluation methods.

13) That every medical college should have curriculum committee which would plan curricula and instructional method which would be updated regularly.

With advances in science and technology, integration of ICT in teaching learning process is required and be implemented.

Doctors are confronted with many ethical issues and problems. It is necessary for every doctor to be aware of these problems. The doctors need to be trained to analyze the ethical problems and deal with them in an acceptable manner. It is recommended that teaching of medical ethics be introduced in phase I and continued throughout the course including the internship period.

Awareness regarding history of medicine is necessary to understand the developments.Teaching of History of Medicine to be incorporated in the course .

BLDE University endorses these recommendations and strongly desires to implement them while conducting the MBBS course.

SECTION - I

Objectives of Medical Education

(As stated in MCI Regulations, 1997)

This section contains the goals and general objectives of graduate medical education as stated in MCI Regulations, It is desired that in consonance with these national goals, each medical college should evolve institutional objectives.

(1) NATIONAL GOALS:

At the end of undergraduate programme, the medical student shall endeavour to be able to:

(a) Recognise 'health for all' as a national goal and health right of all citizens and by undergoing training for medical profession fulfill his/her social obligations towards realization of this goal;

(b) Learn every aspect of National policies on health and devote himself/herself to its practical implementation;

(c) Achieve competence in practice of holistic medicine, encompassing primitive, preventive, curative and rehabilitative aspects of common diseases.

(d) Develop scientific temper, acquire educational experience for proficiency in profession and promote health living.

(e) Become exemplary citizen by observation of medical ethics and fulfilling social and professional obligations, so as to respond to national aspirations.

(2) INSTITUTIONAL GOALS

The undergraduate students coming out of a medical institution should:

(a) Be competent in diagnosis and management of common health problems of individual and the community, commensurate with his/her position as a member of the health team at the primary, secondary or tertiary levels, using his/her clinical skills based on history, physical examination and relevant investigations;

(b) Be competent to practice preventive, promotive, curative and rehabilitative medicine in respect to the commonly encountered health problems;

(c) Appreciate for different therapeutic modalities, be familiar with the administrations of the "essential drugs" and their common side effects;

(d) Be able to appreciate the social-psychological, cultural, economic and environmental factors affecting health and develop humane attitude towards the discharging one's professional responsibilities.

(e) Possess the attitude for continued self learning and to seek further expertise or to pursue research in any chosen area of medicine, action research and documentation skills.

(f) Be familiar with the basic factors, which are essential for the implementation of the National Health Programs including practical aspects of the following:-

- i) Family Welfare and Maternal and Child Health (MCH)
- ii) Sanitation and water supply,
- iii) Prevention and control of communicable and non-communicable diseases,
- iv) Immunization,
- v) Health Education;
- vi) IPHS standard of health at various levels of service delivery and medical waste disposal.
- vii) Organizational institutional arrangements

(g) Acquire basic management skill in the area of human resources, materials and resource management related to health care delivery, general and hospital management, principal inventory skills and counseling.

(h) Be able to identify community health problems and learn to work to resolve these by designing, instituting corrective steps and evaluating outcome of such measures.

(i) Be able to work as a leading partner in health care teams and acquire proficiency in communication skills.

(j) Be competent to work in a variety of health care settings.

(k) Have personal characteristics and attitude required for professional life such as personal integrity, sense of responsibility and dependability and ability to relate to or show concern for other individuals.

(l) All efforts must be made to equip the medical graduate to acquire the detailed in Appendix B of Medical Council of India Regulations on Medical Education, 1997.

[Source:GME Regulations amended up to February 2012]

SECTION - II

REGULATIONS GOVERNING M.B.B.S. DEGREE COURSE

(Eligibility for Admission, Duration, Attendance and Scheme of Examination.)

1. ELIGIBILITY

1.1 Qualifying Examination

Student seeking admission to first MBBS course:

i) shall have passed two year Pre University examination conducted by Department of Pre University Education, Karnataka State, with English as one of the subjects and Physics, Chemistry and Biology as optional subjects. The candidate shall have passed subjects of English, Physics, Chemistry and Biology individually.

OR

ii) shall have passed any other examination conducted by Boards / Councils / Intermediate examination established by State Governments / Central Government and recognized as equivalent to two year Pre University examination by the BLDE University / Association of Indian Universities (AIU), with English as one of the subjects and Physics, Chemistry and Biology as optional subjects and the candidate shall have passed subjects of English, Physics, Chemistry and Biology individually.

OR

iii) shall have passed Intermediate examination in Science of an Indian University / Board / council or other recognized examining bodies with Physics, Chemistry and Biology, which shall include a practical test in these subjects and also English as compulsory subject. The candidate shall have passed subjects of English, Physics, Chemistry and Biology individually.

OR

iv) shall have passed first year of the three year degree course of a recognized University with Physics, Chemistry and Biology including a practical test in these subjects provided the examination is an 'University Examination' provided that the candidate shall have passed subjects of English, Physics, Chemistry and Biology individually in the Pre University or other examinations mentioned in the clauses above.

OR

v) shall have passed B.Sc. Examination of an Indian University, provided that he/she has passed the B.Sc. examination with not less than two of the following subjects: Physics, Chemistry, Biology (Botany, Zoology) provided that candidate has passed subjects of English, Physics, Chemistry and Biology individually in the qualifying examinations mentioned in clauses (i) (ii) and (iii).

Note: Candidates who have passed "Physical Science" instead of Physics and Chemistry as two separate subjects are not eligible for admission to MBBS course as per Medical Council of India Regulations vide letter MCI-37(2)/2001/Med.922 dated 14.02.2001

1.2 Marks

The selection of students shall be based on merit provided that:

a) In case of admission on the basis of qualifying examination, a candidate for admission to MBBS course must have passed individually in the subjects of Physics, Chemistry, Biology and English and must have obtained not less than 50% marks for general category,40% for SC,ST and OBC students taken together in Physics, Chemistry and Biology in the qualifying examination

. The minimum marks shall not be less than 45% taken together in Physics, Chemistry and Biology for physically handicapped candidates with lower limb locomotor disability of 40 to 70%.

b) The student shall appear for the competitive entrance examination conducted by the BLDE University, must have come in the merit list prepared as a result of such competitive entrance examination by securing not less than 50% marks for general. category,40% for SC,ST and

OBC category students and 45% for candidates with lower limb locomotor disability of 40 to 70%. in Physics, Chemistry and Biology taken together in the competitive examination.

1.3 **Age:** The candidate should have completed 17 years of age on or before 31st day of December of the year of admission.

2. DURATION OF THE COURSE

i) Every student shall undergo a period of certified study extending over $4^1/_2$ Academic years from the date of commencement of this study for the subject comprising the medical curriculum to the date of completion of the examination followed by one year compulsory rotating Internship.

The $4^1/_2$ years course has been divided into three Phases.

1. **Phase – I** – 1 year, consisting of two terms of 6 months each.
2. **Phase – II** - $1^1/_2$ years, consisting of three terms of 6 months each
3. **Phase – III** - 2 years, consisting of 4 terms of 6 months each.

ii) The first year shall be occupied in the study of the Phase - I (Pre Clinical) subject of Human Anatomy (650 hours), Physiology including Bio Physics (480 hours), Bio Chemistry (240 hours) and Introduction to Community Medicine (60 hours). A detailed syllabus is given in later Section.

iii) After passing pre-clinical subjects in Phase – I, the Phase – II shall be 3 terms ($1^1/_2$ years), devoted to Para clinical and Clinical subjects. Para Clinical subjects shall consist of Pathology, Pharmacology, Microbiology, Forensic Medicine including Toxicology and part of Community Medicine. During this phase the clinical subjects shall be taught concurrently. The clinical subjects taught will be Medicine and its allied specialties, Surgery and its allied specialties and Obstetrics and Gynaecology.

iv) Phase – III Part-I consists of Community Medicine, ENT and Ophthalmology.

v) Phase – III Part-II consists of Medicine, Paediatrics, Surgery and their allied specialties, Obstetrics and Gynaecology.

3. ACADEMIC TERMS

All candidates admitted beyond the last date stipulated by the University shall have to appear for I Professional Examination to be held subsequent to the regular examination after completion of the prescribed duration.

4. ATTENDANCE

Every candidate should have attendance not less than 75 % of the total classes conducted in theory, practical and clinical jointly in each calendar year calculated from the date of commencement of the term to the last working day as notified by the University in each of the subjects prescribed to be eligible to appear for the University Examination. (vide Medical Council of India Notification on Graduate Medical Education (Amendment) Regulations 2003, published in the Gazette of India Part III, Section 4, Extraordinary issued on 15th October 2003)

The Principal should notify at the college the attendance details at the end of the each term without fail under intimation to this University.

The candidate lacking in the prescribed attendance and progress in any subject(s) in theory or practical/clinical in the first appearance should not be permitted to appear for the examination in that subject(s)

5. TEACHING HOURS

Phase II

Table: Teaching hours for theory and practical classes for the Phase – II subjects

Subject	Theory	Practicals	Integrated Teaching	Total hours
Pathology	120 hrs	144 hrs	36 hrs	300
Pharmacology	120 hrs	144 hrs	36 hrs	300
Microbiology	120 hrs	94 hrs	36 hrs	250
Forensic Medicine	70 hrs	20 hrs	10 hrs	100
Community Medicine*	100 hrs	80 hrs	20 hrs	200

***** Community Medicine teaching will continue in Phase III, Part I also

SCHEME OF EXAMINATION

6. INTERNAL ASSESSMENT

It shall be based on evaluation of assignment, preparation of seminar, clinical presentation etc. Regular periodic examinations should be conducted throughout the course. Although the question of number of examinations is left to the institution, there should be a minimum of at least three (3) sessional examinations during Phase – I of the course and average of best two examination marks should be taken into consideration while calculating the assessment. One of these tests can be in the form of MCQS and one practical test can be in the form of OSPE. The weightage given to internal assessment is 20% out of total marks assigned for a subject.

A student must secure at least 35% of total marks fixed for internal assessment in a particular subject in order to be eligible to appear in the University Examination of that subject. (vide Medical Council of India Notification on Graduate Medical Education (Amendment) Regulations 2003, published in the Gazette of India Part III, Section 4, Extraordinary issued on 15th October 2003).

Assistant Professor and above or lecturer with five years of teaching experience can conduct Internal Assessment Examination. Proper record of the work should be maintained which will be the basis of all students' internal assessment and should be available for scrutiny. The internal assessment marks of both theory and practical obtained by the candidates should be sent to the University at least fifteen days prior to the commencement of theory examination.

Phase II

Internal Assessment in Pathology, Pharmacology, Microbiology and Community Medicine

Total Marks : 80 (Theory – 60 and Practical – 20)

Theory

Minimum of three examinations are recommended. The examination preceding the University examination will be similar to the University examination. The total marks would be 60. Average marks of best of two notified internal examinations should be reduced to 60 and should be sent to the University.

Practicals

A minimum of three practical tests is to be conducted, one at the end of each term. Five marks will be for records and 15 marks for terminal examinations. Average marks of the

three terminal examinations shall be reduced to 15 marks and added to the marks obtained for records and sum of the two shall be sent to the University.

Internal Assessment in Forensic Medicine
Total marks: 40 (Theory – 30 and Practical – 10)

Theory

Minimum of three examinations are recommended. The examination preceding the University examination will be similar to the University examination. The total marks would be 20. Average marks of the best of two notified internal examinations should reduced to 20 and should be sent to the University.

Practicals

Internal Assessment examination for Practicals and allotment of marks for records will be as follows: The total of 10 marks will be first increased notionally to 50. Out of the 50 marks, 40 will be allotted to terminal practical tests and 10 marks for records. Four practical tests shall be conducted each carrying 10 marks. The marks obtained in the four practical tests and records would be reduced to 10 and sent to the University.

7. University Examination – Subjects and Distribution of Marks

Phase II
Table: Examination components, Subjects and Distribution of Marks

		Pathology	**Microbiology**	**Pharmacology**	**Forensic Medicine**	**Community Medicine**
a. 1.	**Theory** Written Paper: No of papers & maximum marks for each paper	Two 2x100=200	Two 2x100=200	Two 2x100=200	One 100	Two 2x100=200
2.	Viva-Voca	40	40	40	20	40
3.	Internal assessment	60	60	60	30	60
	Total Theory	**300**	**300**	**300**	**150**	**300**
b.	**Practical** Practical	80	80	80	40	80
2.	Internal Assessment (Practical)	20 (Practicals 15 + Record 5)	20 (Practicals 15 + Record 5)	20 (Practicals 15 + Record 5)	10 (Practicals 5 + Record 5)	20 (Practicals 15 + Record 5)
	Total Practicals	**100**	**100**	**100**	**50**	**100**
	Grand Total	**400**	**400**	**400**	**200**	**400**

***Note: The examination for Community Medicine will be held in Phase III along with Part – I subjects.**

Table: Type, number of questions and distribution of marks for written paper.

Type of Questions	Number of questions	Marks for each question
Essay type questions	2	10
Short Essay types questions	10	5
Short answer questions	10	3

8. SUBMISSION OF LABORATORY RECORD NOTE BOOK

(a) At the time of Practical/Clinical Examination each candidate shall submit to the Examiners his/her laboratory notebook duly certified by the Head of the Department as a bonafide record of the work done by the candidate.

(b) No material, handwritten, cyclostyled or printed guides are allowed for reference during the practical examination.

9. ELIGIBILITY FOR EXAMINATION:

To be eligible to appear for University examination a candidate:-

(a) Shall have undergone satisfactory the approved course of study in the Subject/subjects for the prescribed duration.

(b) Shall have attended at least 75% of the total number of classes in theory and practical/clinical, jointly to become eligible to appear for examination in that subject/subjects.

(c) Shall secure at least 35 % of total marks fixed for internal assessment in a particular subject in order to be eligible to appear in the University Examination of that subject.

(d) Shall fulfill any other requirement that may be prescribed by the University from time to time.

(e) Who fails in the II professional examination shall not be allowed to appear in Part I of Third professional examination unless he/she passes all subjects of II Professional examination.

10. CRITERIA FOR PASS

For declaration of pass in any subject in the University examination, a candidate shall pass both in Theory and Practical/Clinical examinations components separately as stipulated below

A student has to secure marks as follows to pass in a subject:

i) 35% in internal assessment (for eligibility to appear for University examination)

ii) 50% of the total marks for Theory with Orals (only externals)

iii) 50% of the marks of Practical / Clinical (only externals)

iv) 50% of the aggregate (total of externals and internals)

A candidate not securing 50% marks in aggregate in Theory or Practical/Clinical examination in a subject shall be declared to have failed in that subject and is required to appear for both theory and Practical/Clinical again in the subsequent examination in that subject.

11. DECLARATION OF CLASS:

a) A candidate having appeared in all the subjects in the same examination and passed that examination in the first attempt and secures 75% of marks or more of grand total marks prescribed will be declared to have passed the examination with distinction.

b) A candidate having appeared in all the subjects in the same examination and passed that examination in the first attempt and secures 65% of marks or more but less than 75% of grand total marks prescribed will be declared to have passed the examination in First Class.

c) A candidate having appeared in all the subjects in the same examination and passed that examination in the first attempt and secures 50% of marks or more but less than

65% of grand total marks prescribed will be declared to have passed the examination in Second Class.

d) A candidate passing the university examination in more than one attempt shall be placed in Pass class irrespective of the percentage of marks secured by him/her in the examination.

[Please note fraction of marks should not be rounded off for clauses (a), (b) and (c)]

12. MIGRATION

a) Migration from one medical college another is not a right of a student. However, migration of students from one medical college to another medical college in India may be considered by Medical Council of India, only in exceptional cases on extreme compassionate grounds, provided following criteria are fulfilled. Routine migrations on other grounds shall not be allowed.

b) Both the colleges, i.e., one at which the student is studying at present and one to which migration is sought, should have been recognized by the Medical Council of India.

c) The applicant candidate should have passed first professional MBBS examination.

d) The applicant candidate should submit his/her application for migration complete in all respects, to all authorities concerned within a period of one month of passing (declaration of results) the first professional Bachelor of Medicine and Bachelor of Surgery (MBBS) examination.

e) The applicant candidate must submit an affidavit stating that he/she will pursue 18 months of prescribed study before appearing for II professional MBBS examination at the transferee medical college, which should be duly certified by the Registrar of the concerned University in which he/she is seeking transfer. The transfer will be applicable only after receipt of the affidavit.

NOTE I:

i. Migration during clinical course of study shall not be allowed on any ground.

ii. All applications for migration shall be referred to Medical Council of India by college authorities. No Institution/University shall allow migration directly without the approval of the Council.

iii. Council reserves the right, not to entertain any application which is not under the prescribed compassionate grounds and also to take independent decision where applicant has been allowed to migrate without referring the same to the Council.

NOTE II: * Compassionate grounds criteria:

i. Death of a supporting parent or guardian

ii. Illness of the candidate causing disability

iii. Disturbed conditions as declared by Government in the Medical College area.

DEPARTMENT OF PATHOLOGY

CURRICULUM

GOALS

The goal of teaching pathology is to provide undergraduate students comprehensive knowledge of the causes, mechanisms of disease, the structural alterations induced in the cells and organs of the body and the functional consequences of the morphological changes, in order to enable them to achieve complete understanding of the natural history and clinical manifestations of the disease.

OBJECTIVES

Knowledge

MBBS student at the end of training in Pathology will be able to:

1. Understand the concepts of cell injury and changes produced thereby in different tissues and organs and the body's capacity for healing.
2. Understand the normal homeostatic mechanisms, the derangements of these mechanism and the effects on human systems.
3. Have a knowledge of common genetic, immunological and geriatric disorders and their resultant effects on the human body
4. Understand the concept of neoplasia with reference to the etiology, gross and microscopic features, diagnosis and prognosis in different tissues and organs of the body.
5. Understand the etiopathogenesis, the pathological effects and the clinico-pathological correlation of common infectious and non-infectious diseases.
6. Have an understanding of the common haematological disorders and the investigations necessary to diagnose them and determine their prognosis.
7. Correlate normal and altered morphology (gross and microscopic) of different organ systems in different diseases to the extent needed for understanding of disease processes and their clinical significance.
8. Understand different types of biomedical waste, their potential risks and their management.

Skills

At the end of the course, the student should be able to:-

1. Describe the rationale and principles of technical procedures of the diagnostic laboratory tests and interpretation of the results.
2. Perform the simple bed-side tests on blood, urine and other biological fluid samples.
3. Plan for investigations aimed at diagnosis and management of the cases of common disorders in collaboration with clinical departments.
4. Understand biochemical/physiological disturbances that occur as a result of disease in collaboration with pre clinical departments.
5. Understand the utility of frozen section, automated hematology cell counter, flow cytometry and molecular diagnostic techniques.

Integration: After training the student should be able to understand the evolution of disease states, clinical features and role of laboratory tests in the diagnosis and management of various diseases.

COURSE CONTENTS

THEORY

(A) GENERAL PATHOLOGY

1. INTRODUCTION TO PATHOLOGY

- Introduction and scope of pathology
- Brief resume of historical aspects, present state and future.
- Terminology in pathology
- Branches of pathology

2. CELLULAR ADAPTATIONS, CELL INJURY AND CELL DEATH

MUST KNOW

Cellular adaptation of growth & differentiation :

- Hyperplasia
- Hypertrophy
- Atrophy
- Metaplasia

Diseased cell:

- Types, causes, mechanisms of cell injury
- Depletion of ATP
- Mitochondrial damage
- Influx of intra cellular calcium & loss of calcium homeostasis
- Oxidative stress & defects in membrane permeability

Morphology of cell injury

- Ischemic & hypoxic cell injury
- Ischemia reperfusion injury
- Chemical injury

Cell death – Necrosis types & morphology

Apoptosis

- Causes : Physiological & pathological with examples
- Morphology
- Biochemical features
- Mechanisms

Intracellular accumulations

- Lipids-fatty changes & others
- Proteins
- Glycogen
- Hyaline change
- Pigments- exogenous endogenous
- Pathological calcification- Dystrophic and metastatic

DESIRABLE TO KNOW
Ochronosis, Porphyria

3. ACUTE &CHRONIC INFLAMMATION
MUST KNOW
Acute inflammation
- Introduction
- Causes
- Vascular changes
- Cellular events
- Outcomes & morphological pattern

Chemical mediators of inflammation
- Vasoactive amines
- Plasma proteins arachidonic metabolites
- Platelet activating factors
- Cytokines & chemokines
- Nitric oxide
- Lysosomal constituents of leucocytes
- Oxygen derived free radicals
- Neuropeptides

Chronic inflammation
- Causes
- Morphological features
- Types of chronic inflammation-granulomatous inflammation with examples

Systemic effects of inflammation

4. TISSUE RENEWAL & REPAIR
MUST KNOW
Introduction –
- Definitions of regeneration and healing
- Control of normal cell proliferation & tissue growth
- Tissue proliferative activity-labile tissues stable tissues permanent tissues

Wound healing by first intention and secondary intention
- Wound strength
- Factors affecting wound healing
- Complications in cutaneous wound healing-keliod & hypertropic scar
- Healing of fracture bone

DESIRABLE TO KNOW
- Stem cell- role of stem cells in tissue homeostasis
- Growth factors
- Signaling mechanisms in cell growth-autocrine paracrine endocrine
- Cell cycle &regulation of replication
- Extracellular matrix & cell –matrix interaction in brief
- Angiogenesis

5. HEAMODYNAMIC DISORDERS
MUST KNOW
Edema
- Pathophysiology
- Types
- Clinical correlations

Hyperemia & Congestion
- CVC Liver, Spleen and Lung

Hemorrhage

Thrombosis
- Normal Homeostasis
- Pathogenesis
- Fate of thrombus

Embolism
- Types
- Fate & Effects

Infarction & Clinical correlation

Shock
- Pathogenesis
- Types
- Morphology
- Clinical course

6. GENETICS
MUST KNOW
- Basic concepts of genetic disorders
- Some common examples and congenital malformations
  Down syndrome, Turner syndrome, Klinefilter syndrome, storage disorders

7. DISEASES OF IMMUNITY
MUST KNOW
General features of immune system
- Innate & Adaptive Immunity
- Cells &tissues of immune system
- Cytokines
- Structure & functions of histocompatibility molecules

Hypersensitivity reactions
Transplant rejection

Autoimmune diseases
- Immunological tolerance
- Mechanisms of autoimmune diseases SLE as prototype

Immunological deficiency syndromes

- Primary immuno deficiency
- AIDS

Amyloidosis

DESIRABLE TO KNOW

Clinical evaluation of immune status

- Humoral immunity
- Cell mediated immunity

7.NEOPLASIA

MUST KNOW

Introduction to neoplasia

- Definition
- Nomenclature
- Biology of tumour growth
- Benign & Malignant neoplasms
- Differentiation & Anaplasia
- Local invasion, Metastasis, and Precancerous conditions

Molecular basis of cancer (only concept)

Essential alterations for malignant transformation

- Self sufficiency in growth signals: oncogenes
- Insensitivity to growth inhibitory signals: tumour suppressor genes
- Evasion of apoptosis
- DNA repair defects & genomic instability in cancer cells
- Limitless replicative potential: telomerase
- Development of sustained angiogenesis
- Invasion & metastasis
- Stromal micro environment & carcinogenesis

Dysregulation of cancer associated genes

Multistep carcinogenesis

Tumour progression & heterogenecity

Carcinogenic agents & their cellular interaction

- Chemical carcinogenesis
- Radiation carcinogenesis
- Microbial carcinogenesis

Host defense against tumours

Tumour immunity

- Tumour antigens
- Antitumour effector mechanisms
- Immune surveillance

Clinical features of tumours

- Effects of tumours on host
- Grading & staging of tumour with relevant examples

Laboratory diagnosis of cancer

- Histology
- Cytology
- Cytochemistry
- Immunohistochemistry
- Molecular diagnosis
- Flow cytometry
- Tumour markers

DESIRABLE TO KNOW

Molecular basis of Neoplasia (Details)
Immune surveillance
Molecular diagnosis
Flowcytometry

9. INFECTIOUS DISEASES

MUST KNOW

Introduction

- History
- New & emerging infectious diseases
- Agents of bioterrorism
- Categories of infectious agents
- Transmission & dissemination of microbes
- How microbes cause disease

Viral infections

- Measles
- Mumps
- Polio
- Rabies
- Herpes

Bacterial infections

- Diphtheria
- Anthrax
- Whooping cough
- Plague
- Chancroid
- Granuloma inguinale
- Pseudomonas infections

Mycobacterial infections

- Tuberculosis
- Leprosy

Spirochetes

- Syphilis

Fungal infections

- Candidiasis

- Cryptococcosis
- Moulds
- Aspergillosis
- Mucormycosis

Protozoa
- Malaria
- Leishmaniasis
- Amoebiasis
- Trypanosomiasis
- Metazoan

10. ENVIRONMENTAL & NUTRITIONAL PATHOLOGY

MUST KNOW

Nutrition & diseases
- Nutrition deficiency
- Protein energy malnutrition
- Anorexia nervosa and bulimia
- Vitamin deficiency
- Obesity

Biomedical wastes
- Types
- Potential risks & their safety
- Management

DESIRABLE TO KNOW

Environment & disease
- Recognition of occupational & environmental disease
- Mechanism of toxicity
- Common environmental& occupational exposures
- Personal exposures
- Tobacco use
- Alcohol abuse
- Drug abuse
- Radiation injury
- Ionizing radiation
- Ultraviolet radiation
- Electromagnetic fields
- Outdoor air pollution & indoor air pollution

11. DISEASES OF INFANCY AND CHILDHOOD

MUST KNOW
- Neonatal respiratory distress syndrome
- Hydrops fetalis
- Inborn errors of metabolism- Cystic fibrosis, Galactosemia, Phenylketonuria
- Tumors- Retinoblastoma, Neuroblastoma, Nephroblastoma

DISEASES OF ORGAN SYSTEMS

12. CARDIOVASCULAR PATHOLOGY

MUST KNOW

Disease of Blood vessels

Atherosclerosis
Hypertensive vascular disease
Aneurysms -Abdominal aortic aneurysm, Syphilitic aneurysm
Aortic dissection

Inflammatory disease (Vasculitides)

- Giant cell arteritis
- Takayasu arteritis
- Polyarteritis nodosa
- Leucocytoclastic vasculitis
- Wegener's granulomatosis
- Beurger's disease

Diseases of Heart

Congenital heart disease

- ASD
- VSD
- Fallot's tetralogy
- PDA
- Coarctation of aorta
- Pulmonary stenosis & atresia
- Aortic stenosis & atresia

Ischemic heart diseases

- Angina pectoris
- Myocardial infarction

Rheumatic fever & rheumatic heart disease

Infective endocarditis
Non infected vegetations

DESIRABLE TO KNOW

Cardiomyopathies
Tumours of heart

13. RBC DISORDERS AND BLEEDING DISORDERS

MUST KNOW

Normal Development of Cells
Anemia

- Classification
- Clinical Features
- Anemia of diminished erythropoiesis

Iron deficiency anemia

Megaloblastic anemia

Hemolytic anemias
- Classification
- Investigations

Hereditary spherocytosis
Sickle cell disease
Enzyme deficiencies

Thalassemia syndromes
- Beta Thalassemia
- Alpha Thalassemia

Acquired hemolytic anemias
- Immune hemolytic anemia- Autoimmune, Drug induced, Isoimmune
- Mechanical trauma- Microangiopathic hemolytic anemia
- Membrane abnormalities

Aplastic anemia

Blood grouping: Concept of blood group, selection of donor, major and minor cross matching, blood transfusion, reaction, diseases transmitted by blood transfusion and Coomb's test.

Bleeding disorders
- Review of normal hemostasis
- Test to evaluate different aspects of hemostasis
- Bleeding disorders caused by vessel wall abnormalities
- Bleeding related to reduced platelet number
- Bleeding disorders related to defective platelet functions

Hemorrhagic diathesis related to abnormalities in clotting factors
- Von Willebrand disease
- Hemophilia A
- Hemophilia B

Disseminated intravascular coagulation

DESIRABLE TO KNOW
Study of bone marrow and marrow transfusion

14. WHITE BLOOD CELL DISORDERS
MUST KNOW
Leucopenia, Leucocytosis & leukemoid reaction

Leukemias: Classification
- Acute lymphoblastic leukemia

(morphology, immunophenotype, cytogenetics, molecular genetics, clinical features, prognosis)

- Acute myelogenous leukemia (pathophysiology, classification, morphology, chromosomal abnormalities, clinical features, prognosis)
- Chronic myelogenous leukemia (Pathophysiology, morphology, clinical features, prognosis)
- Chronic lymphocytic leukemia (Pathophysiology, morphology, clinical features, prognosis)
- Hairy cell leukemia (Pathophysiology, morphology, clinical features, prognosis)

Plasma cell neoplasms & related disorders

- Multiple myeloma
- Solitary myeloma
- Monoclonal gammopathy of uncertain significance
- Lymphadenitis – Nonspecific & Granulomatous
- Causes of lymph node enlargement – Reactive & Neoplastic
- Hodgkins lymphoma
- Non-Hodgkins lymphoma – Prototypes only
- Causes of Spleen enlargement

DESIRABLE TO KNOW

Myelo dysplastic syndromes

- Definition
- Cytogenetic changes
- Peripheral smear and bone marrow features
- Clinical features and prognosis

Chronic myeloproliferative disorders

- Polycythemia vera
- Essential thrombocytosis
- Primary myelofibrosis

Thymus - Thymoma

15. RESPIRATORY PATHOLOGY

MUST KNOW

Atelectasis,
Congenital anomalies,
Acute lung injury
Pulmonary oedema
Acute respiratory distress syndrome
Acute interstitial pneumonia

Obstructive pulmonary diseases

- Emphysema
- Chronic bronchitis
- Bronchietasis
- Asthma
- Tuberculosis- primary and secondary

Pulmonary infections

- Community acquired acute pneumonia
- Community acquired atypical pneumonia
- Nosocomial pneumonia
- Aspiration pneumonia
- Lung abscess
- Chronic pneumonia

Tumours of lung

- Etiology
- Pathogenesis
- Classification
- Morphology
- Staging

DESIRABLE TO KNOW

Pneumoconiosis

- Coal worker's pneumoconiosis
- Silicosis
- Asbestosis

Granulomatous diseases

- Sarcoidosis

Mesothelioma

16. GASTRO INTESTINAL TRACT

MUST KNOW

Oral cavity

- Ulcers
- Leukoplakia
- Erythroplakia
- Carcinoma of Oral cavity

Oesophagus

- Congenital anomalies
- Achalasia
- Hiatus hernia
- Lacerations
- Oesophagitis- Reflux, infectious & chemical oesophagitis
- Barrett esophagus
- Tumours : malignant tumours- squamous cell carcinoma, adenocarcinoma

Stomach

- Gastric mucosal physiology
- Gastritis- Acute and Chronic
- Peptic ulcer disease
- Tumours - Gastric carcinoma, Gastric lymphoma, Gastric carcinoid

Small & large intestines

- Congenital anomalies- Atresia, Stenosis, Meckel's diverticulum, Congenital aganglionic megacolon
- Malabsorption syndromes- Introduction, classification, celiac disease, tropical sprue, whipple disease, disaccharidase deficiency, abetalipoproteinemia
- Idiopathic inflammatory bowel disease- Etiology & pathogenesis, Crohn disease, Ulcerative colitis
- Tumours of colon & rectum- Non neoplastic polyps, Adenomas, Familial syndromes, Carcinoid tumours, Colorectal cancer, Gastrointestinal lymphoma

Appendix

- Acute appendicitis
- Tumours of appendix
- Mucocele & Pseudomyxoma peritonei
- Carcinoid tumor

Salivary gland tumours- Pleomorphic adenoma, Warthin's tumour, Mucoepidermoid carcinoma, Acinic cell tumours

17. LIVER, BILARY TRACT AND PANCREAS

MUST KNOW

- Hepatic failure
- Cirrhosis with Indian childhood cirrhosis
- Portal hypertension
- Jaundice & cholestasis,
- Liver function tests
- Viral hepatitis
- Neonatal hepatitis
- Autoimmune hepatitis
- Alcoholic liver disease
- Haemochromatosis
- Wilson disease
- Alpha 1 antitrypsin deficiency
- Biliary cirrhosis
- Nodules & tumours

Disorders of gall bladder

- Cholelithiasis
- Cholecystitis
- Biliary atresia
- Carcinoma of gall bladder & extra hepatic bile ducts

The Pancreas

- Acute pancreatitis
- Chronic pancreatitis
- Pancreatic carcinoma

18. THE KIDNEY

MUST KNOW

Clinical manifestations of renal diseases
Congenital anomalies including cystic diseases of the kidney
Pathogenesis of glomerular injury
Mechanisms of progression in glomerular disease

- Acute glomerulonephritis
- Rapidly progressive glomerulonephritis

Nephrotic syndrome

- Membranous glomerulopathy
- Minimal change disease
- Focal segmental glomerulosclerosis
- Membrano proliferative glomerulonephritis
- IgA nephropathy
- Alport's syndrome

Chronic glomerulonephritis
Glomerular lesions associated with systemic disease

- Diabetic glomerulosclerosis
- Other diseases

Acute tubular necrosis
Tubulointerstitial nephritis

- Pyelonephritis & urinary tract infection
- Acute pyelonephritis
- Chronic pyelonephritis & Reflux nephropathy
- Myeloma kidney

Renal function tests

Tumours of the kidney

- Renal cell carcinoma
- Urothilial carcinoma of the renal pelvis

DESIRABLE TO KNOW

Nephrosclerosis : - benign & malignant
Obstructive uropathy
Urolithiasis

19. LOWER URINARY TRACT & MALE GENITAL SYSTEM

MUST KNOW

Ureters

- Congenital anomalies
- Inflammations
- Tumours & tumour like lesions
- Obstructive lesions

Urinary bladder

- Congenital anomalies
- Inflammations
- Metaplastic lesion
- Neoplasms
- Obstruction

Penis

- Congenital anomalies
- Tumours

Testis & epididymis

- Congenital anomalies
- Regressive changes
- Inflammations
- Vascular disturbances
- Testicular tumours

Prostate

- Inflammations
- Benign enlargement
- Tumours

Semen Analysis

20. THE FEMALE GENITAL TRACT
MUST KNOW

Vulva

- Bartholin cyst
- Lichen sclerosis
- Lichen simplex chronicus
- Neoplasms

Vagina

- Congenital anomalies
- Premalignant & malignant neoplasms

Cervix

- Inflammations
- Endocervical polyps
- Cervical intraepithelial neoplasia
- Invasive squamous neoplasms

Body of the uterus & endometrium

- Endometrial histology in the menstrual cycle
- Dysfunctional uterine bleeding
- Chronic endometritis
- Endometriosis & adenomyosis

- Endometrial hyperplasia
- Carcinoma of endometrium
- Myometrial tumours- Leiomyoma, Leiomyosarcoma

Ovaries
- Follicular & leuteal cyst
- Polycystic ovaries
- Stromal hyperthecosis
- Ovarian tumours- Pathogenesis, Classification (Tumours of Mullerian epithelium, Germ cell tumours, Sex cord stromal tumours)

Exfoliative cytology, FNAC and FNAB

Gestational &placental disorders
- Spontaneous abortion
- Ectopic pregnancy
- Placental anomalies
- Inflammations toxemia of pregnancy
- Hydatiform mole- Complete, Partial, Invasive
- Choriocarcinoma
- Placental site trophoblastic tumour

DESIRABLE TO KNOW

Approach to Infertility (Male & Female factors)

21. THE BREAST

MUST KNOW

Benign epithelial lesions
- Fibrocystic change
- Proliferative breast disease without atypia
- Proliferative breast disease with atypia

Carcinoma of the breast
- Risk factors
- Etiology & pathogenesis
- Classification- Morphology of each

Gynaecomastia

22. THE ENDOCRINE SYSTEM

MUST KNOW

Thyroid gland
- Hyperthyroidism
- Hypothyroidism-Cretinism and Myxedema
- Thyroiditis- Hashimoto, subacute, lymphocytic
- Grave's disease
- Diffuse & multinodular goiter
- Neoplasms of the thyroid- Adenomas, Carcinomas
- Thyroid function tests

Diabetes mellitus

- Classification
- Normal insulin physiology
- Clinical features
- Pathogenesis of Type 1 DM
- Pathogenesis of Type 2 DM
- Monogenic forms of DM
- Pathogenesis of complications of dm
- Morphology of diabetes & its complications
- Diagnosis

DESIRABLE TO KNOW

Adrenal glands

- Adrenocortical hyperfunction- Cushing syndrome, Primary hyperaldosteronism, Adrenogenital syndromes
- Adrenal insufficiency- Primary acute adrenocortical insufficiency, Waterhouse-Friderichsen syndrome, Addison disease, Secondary adrenocortical insufficiency
- Tumours- Adrenocortical neoplasms, Adrenal medullary neoplasms

MEN syndromes

Pituitary gland

- Normal
- Pituitary adenoma & hyperpituitarism
- Hypopitutarism
- Posterior pituitary syndromes

Parathyroid glands

- Normal
- Hyperparathyroidism- Primary, Secondary
- Hypoparathyroidism
- Pseudo hypoparathyroidism

23. THE SKIN

MUST KNOW

Skin tumours

- Squamous cell carcinoma
- Basal cell carcinoma
- Nevus, Dysplastic nevi
- Malignant melanoma.

Inflammatory Dermatoses:

- Acute: Urticaria, Acute eczematous Dermatitis, Erythema Multiforme
- Chronic: Psoriasis, Lichen planus

DESIRABLE TO KNOW

Bullous diseases:

- Pemphigus, Bullous pemphigoid, Dermatitis herpitiformis.

Panniculitis, Verrucae, Molluscum contagiosum

24. BONES, JOINTS AND SOFT TISSUES

DESIRABLE TO KNOW

MUST KNOW

Osteomyelitis

- Pyogenic osteomyelitis
- Tuberculous osteomyelitis

Arthritis

- Rheumatoid arthritis
- Osteoarthritis
- Gout and Gouty Arthritis
- Infectious Arthritis

Bone Tumours:

- Bone forming Tumours: Osteoma, Osteoid Osteoma. Osteoblastoma, Osteosarcoma.
- Cartilage forming tumours: Osteochondroma, Chondroma, Chondroblastoma Chondromyxoid fibroma, Chondrosarcoma.
- Giant Cell Tumour
- Ewing sarcoma

DESIRABLE TO KNOW

Metabolic bone diseases

- Osteoporosis
- Paget disease
- Rickets and osteomalacia
- Hyperparathyroidism
- Renal osteodystrophy

BONE TUMORS

- Fibrous and Fibro-osseous tumours: Fibrous Cortical Defect and Nonossifying fibroma, Fibrous dysplasia, Fibrosarcoma and Malignant fibrous histiocytoma
- Miscellaneous tumours**:** and Primitive neuroectodermal tumour(PNET)
- Metastatic Tumours
- Tumour like lesions

Diseases of joints

- Ganglion and synovial cyst.
- Pigmented villonodular synovitis
- Giant cell tumour of tendon sheath.

Soft tissue tumors

- Fibrous Tumours and Tumour like lesions: Nodular Fasciitis, Myositis Ossificans, Superficial Fibromatoses, Desmoid Tumour and Fibrosarcoma.

- Fibrohistiocytic Tumours: Benign Fibrous Histiocytoma, Malignant Fibrous Histiocytoma.
- Tumours of Skeletal muscle: Rhabdomyoma, Rhabdomyosarcoma
- Tumours of Smooth Muscle: Leiomyoma, Leiomyosarcoma,
- Synovial Sarcoma

25. PERIPHERAL NERVE AND SKELETAL MUSCLE-

DESIRABLE TO KNOW

General reactions of the motor unit

Diseases of the peripheral nerve

- Inflammatory neuropathies
- Infectious polyneuropathies
- Hereditary neuropathies
- Acquired metabolic and toxic neuropathies

Diseases of the skeletal muscle

- Denervation atrophy
- Muscular dystrophies
- Ion channel myopathies
- Congenital myopathies
- Myopathies associated with inborn errors of metabolism
- Inflammatory myopathies
- Toxic myopathies
- Diseases of the neuromuscular junction

26. THE CENTRAL NERVOUS SYSTEM

MUST KNOW

Infectious diseases

- Acute meningitis: Pyogenic, Viral
- Acute suppurative meningitis: brain abscess, subdural empyema, extradural abscess.
- Chronic bacterial meningo encephalitis
- Tuberculosis
- Neurosyphilis
- Viral Meningo enchephalitis: Rabies, HIV meningo encephalitis, Poliomyelitis
- Fungal meningoencephalitis
- Other infectious diseases of the nervous system: toxoplasmosis, cysticercosis

DESIRABLE TO KNOW

Degenerative diseases

- Alzheimer Disease
- Parkinsonism

Tumours:

- Gliomas: Astrocytoma, Oligodendroglioma, Ependymoma .
- Neuronal tumours: ganglion cell tumour
- Poorly differentiated tumours: medulloblastoma, meningioma.

PRACTICALS

A. HEMATOLOGY

1. How to draw blood – demonstration
2. Anticoagulants and their use
3. Drawing of blood film – practice
4. Staining (Leishman) – practice
5. Focusing the slide under microscope and identification of cells
   Students should be shown following slides
   - Microcytic hypochromic anemia
   - Macrocytic anemia
   - Dimorphic anemia
   - Hemolytic anemia
   - Eosinophilia
   - Neutrophilia
   - Reticulocytosis
   - Malarial parasites and microfilaria
   - Megaloblastic anemia-Bone marrow
   - ITP- Bone marrow
   - Multiple myeloma- Bone marrow
   - Acute myeloid leukemia
   - Chronic myeloid leukemia
   - Acute lymphoid leukemia
   - Chronic lymphoid leukemia
6. ESR by Westergren pipette – practice
7. Total count of WBC by Neubauer chamber – practice
8. Packed cell volume by Wintrobe tube – demonstration
9. Hemoglobin estimation by acid hematin method – practice
10. Hemoglobin estimation by Drabkin's method – demonstration
11. Reticulocyte count- demonstration
12. Bleeding time and Clotting time – practice
13. Prothrombin time – demonstration
14. Blood grouping – ABO & Rh – practice
15. Blood bank functioning - demonstration

B. CLINICAL PATHOLOGY

1. Urine – Noting the physical characters, how to measure specific gravity – practice
2. Urine – Chemical tests for protein, reducing substances and ketone bodies- practice
3. Use of different uristix and their interpretation – demonstration
4. Microscopic examination of urine – practice
5. CSF – demonstration of cell type in a normal CSF sample and a case of pyogenic meningitis

C. HISTOPATHOLOGY & CYTOPATHOLOGY

1. Techniques of histopathology & Cytopathology (including FNAC) – demonstration
2. H & E staining and other special staining – demonstration
3. Demonstration of HP slides and specimens

Following histopathology slides and/or specimens should be shown.

- Kidney cloudy change
- Fatty change liver
- Uterus - Leiomyoma with hyaline change
- Kidney - amyloid
- Lymph node - caseous necrosis
- Kidney - infarct (Coagulation necrosis)
- Acute ulcerative appendicitis
- Pyogenic meningitis
- Lepromatous leprosy - skin
- Tuberculoid leprosy - skin
- Actinomycosis
- Granulation tissue
- Ileum - typhoid ulcer
- Tuberculous lymphadenitis
- Amoebic colitis
- CVC lung - haemosiderin pigment
- CVC liver
- Artery - recent / organised thrombus
- Hashimoto's thyroiditis
- Skin - papilloma
- Squamous cell carcinoma
- Adenocarcinoma - Colon
- Lymph node - metastasis
- Skin - capillary haemangioma
- Cavernous haemangioma
- Benign cystic teratoma (Dermoid cyst)
- Stomach - chronic peptic ulcer
- Liver - Viral hepatitis (Massive/ sub-massive necrosis)
- Liver- portal and biliary cirrhosis
- Lung - lobar and broncho pneumonia
- Lung - fibrocaseous tuberculosis
- Heart - rheumatic myocarditis
- Heart - healed infarct
- Aorta - atherosclerosis
- Kidney - crescentic glomerulonephritis
- Kidney - chronic glomerulonephritis
- Kidney - chronic pyelonephritis
- Kidney - RCC
- Benign prostatic hyperplasia
- Testis - seminoma
- Uterus - leiomyoma
- Products of conception
- Hodgkin's lymphoma
- Brain - tuberculous meningitis
- Brain - meningioma
- Bone - osteogenic sarcoma
- Bone - chondroma
- Bone - osteoclastoma
- Skin - melanoma and nevus

- Breast - fibroadenoma
- Breast - carcinoma
- Thyroid - colloid goitre
- Thyroid - papillary carcinoma
- Skin - basal cell carcinoma
- Pap smear- Squamous cell carcinoma- cervix
- FNAC smear- Fibroadenoma breast, carcinoma breast, colloid goiter, tuberculous lymphadenitis.

D. INSTRUMENTS:

- Lumbar puncture needle
- Liver biopsy needle
- Bone marrow aspiration needle
- Wintrobe Tube with stand
- Westergren's E.S.R. Tube and Stand
- Urinometer
- R.B.C. Pipette
- W.B.C. Pipette
- Sahli's Haemoglobinometer
- Sahli's Haemoglobinometer central diluting tube
- Sahli's Haemoglobinometer pipette
- Albuminometer
- Neubauer's Counting Chamber
- CPDA blood bag
- Anticoagulant bulbs
- L blocks
- Microtome
- ELISA based diagnostic cards
- Uristix

E. CHARTS

- T.B.Meningitis
- Viral meningitis
- Pyogenic meningitis
- Nephrotic syndrome
- Acute lymphoblastic leukemia
- Acute myeloblastic leukemia
- Chronic lymphatic leukemia
- Chronic myeloid leukemia
- Microcytic hypochromic anemia
- Multiple myeloma
- Spherocytic anemia with hemolytic jaundice
- Obstructive jaundice
- Juvenile diabetic ketoacidosis
- Vaginal smear - Carcinoma cervix
- FNAC – Fibroadenoma Breast
- FNAC – Infiltrating duct carcinoma breast

TEACHING AND LEARNING METHODOLOGY

Department stresses on teaching basic fundamentals of the disease process and the applied aspects relevant to the clinical subjects.

General Pathology

Taught with the help of Didactic lectures on specific topics, followed by practicals pertaining to that topic. Besides microscopic examination, fresh specimens obtained at autopsy or surgical operations are shown.

Systemic Pathology

The following tools are employed:

i) Didactic lectures: discussing a particular topic at length in an one hour lecture

ii) Paraclinical seminars: are conducted by a combined team of pathologist and a clinician who discuss the pathophysiology and clinical aspects of the particular disease entity.

iii) Case studies: The significant and common diseases are discussed in the form of a representative clinical case in which the clinical features, the course of the disease in that particular patient and relevant laboratory investigations are discussed by a clinical faculty in an interactive manner in small groups. This is followed by demonstration of the gross and microscopic features of the disease in that case by the pathologist. This is followed by clinico-pathologic correlation.

iv) Practicals - Deals with demonstration of gross, and/or microscopic features of the disease entities.

v) Problem based exercises(Charts)

vi) Small group discussion

viii) Self learning tools

ix) Interactive learning

x) Clinical case demonstration - Patients of a particular disease are demonstrated to the students by a clinical faculty in the ward, discussing the clinical features in the patient which provides them a real-life experience of studying a disease as it presents in a patient.

xi) e-modules

By a combination of above modalities/tools, student learns applied aspects of the disease process.

TEACHING SCHEDULE

Sl.No	Date	Topic	Hrs	Teacher
		GENERAL PATHOLOGY		
		INTRODUCTION	1hr	
1.		Introduction & scope of pathology		
		CELLULAR ADAPTATION ,CELL INJURY &CELL DEATH	6hrs	
2.		Cellular adaptation of growth & differentiation :		
3.		Cell injury :		
4.		Morphology of cell injury & necrosis		
5.		Apoptosis		

6.		Intracellular accumulations		
7.		Pathological calcification		
		ACUTE &CHRONIC INFLAMMATION	3hrs	
8.		Acute inflammation		
9.		Chemical mediators of inflammation		
10.		Chronic inflammation		
		TISSUE RENEWAL & REPAIR	3hrs	
11.		Definition –		
12.		Extracellular matrix & cell –matrix interaction in brief		
13.		Wound healing by first intention, secondary intention And Healing of fracture bone		
		HEMODYNAMIC DISORDERS	**4hrs**	
14.		Edema		
15.		Thrombosis		
16.		Embolism		
17.		Shock		
		RBC DISORDERS	**8hrs**	
18.		Normal Development of Cells Anemia- Introduction		
19.		Anemias of diminished erythropoiesis Iron deficiency anemia		
20.		Megaloblastic anemia		
21.		Hemolytic anemia		
22.		Hereditary spherocytosis Sickle cell disease Enzyme deficiencies		
23.		Thalassemia syndromes		
24.		Acquired hemolytic anemia		
25.		Pancytopenia		
		NEOPLASIA	**8hrs**	
26.		Neoplasia- Introduction		
27.		Molecular basis of cancer-I		
28.		Molecular basis of cancer –I		
29.		Molecular basis of cancer- III		
30.		Carcinogenic agents & their cellular interaction		
31.		Host defense against tumours Clinical features of tumours		
32.		Laboratory diagnosis of cancer		
33.		Study of bone marrow and marrow transfusion	**1hr**	
34.		Blood banking	**1hr**	
		WBC DISORDERS	**4hrs**	
35.		Leukemia –I		
36.		Leukemia-II		

37.		Plasma cell neoplasms and related disorders		
38.		Myelodysplastic syndrome		
		LYMPHORETICULAR SYSTEM	**2hrs**	
39.		Hodgkins lymphoma		
40.		Non-Hodgkins lymphoma		
		BLEEDING DISORDERS	**3hrs**	
41.		Platelet disorders		
42.		Hemorrhagic diathesis related to abnormalities in clotting factors		
43.		Disseminated intra vascular coagulation		
		DISEASES OF IMMUNITY	**5hrs**	
44.		General features of immune system		
45.		Hypersensitivity reactions Transplant rejection (in brief)		
46.		Autoimmune diseases		
47.		Immunological deficiency syndromes		
48.		Amyloidosis		
		CARDIOVASCULAR PATHOLOGY	**7hrs**	
49.		Atherosclerosis		
50.		Hypertensive vascular disease		
51.		Inflammatory disease-the vasculitides		
52.		Congenital heart disease Aortic stenosis & atresia		
53.		Ischemic heart diseases		
54.		Rheumatic fever & rheumatic heart disease		
55.		Cardiomyopathies Tumours of heart Kaposi's sarcoma		
		RESPIRATORY PATHOLOGY	**6hrs**	
56.		Atelectasis, congenital anomalies, Acute lung injury		
57.		Obstructive pulmonary diseases		
58.		Pneumoconiosis		
59.		Granulomatous diseases		
60.		Pulmonary infections		
61.		Tumours of lung & mesothelioma		
		GASTRO INTESTINAL TRACT	**10hrs**	
62.		Oesophagus		
63.		Stomach –Gastritis & Peptic ulcer disease		
64.		Tumours		
65.		Small & large intestines Congenital anomalies Malabsorption syndromes		
66.		Idiopathic inflammatory bowel disease		
67.		Tumours of colon & rectum		

68.		Colorectal cancer		
69.		Appendix		
		Salivary gland- Tumours		
		LIVER & BILARY TRACT	**7hrs**	
70.		Hepatic failure Cirrhosis Portal hypertension		
71.		Jaundice & cholestasis, Liver function tests		
72.		Viral hepatitis Neonatal hepatitis Autoimmune hepatitis		
73.		Alcoholic liver disease Haemochromatosis Wilson disease Alpha 1 antitrypsin deficiency Biliary cirrhosis		
74.		Nodules & tumours		
75.		Disorders of gall bladder		
76.		The Pancreas		
		THE KIDNEY	**9hrs**	
77.		Clinical manifestations of renal diseases		
78.		Pathogenesis of glomerular injury		
79.		Acute glomerulonephritis Rapidly progressive glomerulonephritis		
80.		Membranous glomerulopathy Minimal change disease Focal segmental glomerulosclerosis Membrano proliferative glomerulonephritis IgA nephropathy Alport's syndrome		
81.		Chronic glomerulonephritis Glomerular lesions associated with systemic disease Acute tubular necrosis		
82.		Tubulointerstitial nephritis		
83.		Nephrosclerosis : - benign & malignant Obstructive uropathy :- urolithiasis		
84.		Renal function tests		
85.		Tumours of the kidney		
		LOWER URINARY TRACT & MALE GENITAL SYSTEM	**5hrs**	
86.		Ureters and Urinary bladder		
87.		Penis, testis & epididymis		
88.		Prostate		
89.		Semen Analysis		

		THE FEMALE GENITAL TRACT	**7hrs**	
90.		Vulva & Vagina		
91.		Cervix		
92.		Body of the uterus & endometrium		
93.		Ovaries		
94.		Exfoliative cytology, FNAC and FNAB		
95.		Gestational &placental disorders		
		THE BREAST	**2hrs**	
96.		Benign epithelial lesions Carcinoma of the breast		
97.		Carcinoma breast continued		
		THE ENDOCRINE SYSTEM	**5hrs**	
98.		Thyroid gland		
99.		Neoplasms of the thyroid		
100.		Thyroid function tests		
101.		Diabetes mellitus		
102.		Adrenal glands		
103.		Pituitary gland and Parathyroid glands		
		THE SKIN	**2hrs**	
104.		Skin tumours		
105.		Inflammatory Dermatoses &Bullous diseases		
		BONES, JOINTS AND SOFT TISSUES	**4hrs**	
106.		Metabolic bone diseases		
107.		Osteomyelitis and Arthritis:		
108.		Bone Tumours		
109.		Tumour like lesions Fibrous Tumours Fibrohistiocytic Tumours Tumours of Skeleton muscle Tumours of Smooth Muscle		
		THE CENTRAL NERVOUS SYSTEM	**4hrs**	
110.		Infectious diseases		
111.		Degenerative diseases		
112.		Tumours		
113.		CSF Analysis, Body fluids- Pleural, peritoneal, synovial, pericardial fluids		
		DISEASES OF INFANCY AND CHILDHOOD	**2hrs**	
114.		Retinoblastoma, Neuroblastoma Nephroblastoma		
115.		Neonatal respiratory distress syndrome Fetal hydrops Inborn errors of metabolism		
		INFECTIOUS DISEASES	**7hrs**	

116.		Infectious diseases- Introduction		
117.		Viral infections		
118.		Bacterial infections		
119.		Mycobacterial infections		
120.		Fungal infections		
121.		Protozoa		
122.		Biomedical wastes		
		ENVIRONMENT AND NUTRITION	**3hrs**	
123.		Environmental- I		
124.		Environmental- II		
125.		Nutrition & diseases		
126.		Genetics	**1hr**	

PRACTICAL SCHEDULE INCLUDING REVISION PRACTICALS, VIVA VOCE, SEMINARS AND INTERNAL ASSESSMENT EXAMINATIONS.

Sl.No	Date	Topic	Incharge
1.		Introduction	
2.		Microscope Introduction to HPR + Cytology	
3.		Cell Injury I	
4.		Cell Injury II	
5.		Acute Inflammation	
6.		Chronic Inflammation	
7.		Chronic Venous Congestion – Lung & Liver Organizing thrombus, Myocardial infarction Gangrene	
8.		Haematopoiesis, collection of blood, Anticoagulants.	
9.		Hemoglobin estimation, demonstration of Drabkin's method of Hb estimation, ESR	
10.		Demonstration of PCV, RBC count, Blood Indices and principles of cell counter.	
11.		Preparation of blood film and staining (Leishman)	
12.		Microcytic hypochronic Anemia Macrocytic anemia	
13.		Dimorphic anemia, Hemolytic anemia, Reticulocyte count(Demonstration)	
14.		Eosinophilia, Neutrophilia, Malarial parasites and microfilaria	

15.		Megaloblastic anemia-Bone marrow ITP- Bone marrow Multiple myeloma- Bone marrow	
16.		WBC disorders – TC,DC, AEC demonstration	
17.		Acute myeloid leukemia, Chronic myeloid leukemia , Acute lymphoid leukemia, Chronic lymphoid leukemia	
18.		Neoplasia – Benign epithelial & mesenchymal neoplasms- squamous papilloma, adenoma,lipoma, leiomyoma, haemangioma	
19.		Neoplasia – Malignant epithelial & mesenchymal neoplasm - squamous carcinoma, Basal cell carcinoma, malignant melanoma, adenocarcinoma, leiomyosarcoma, liposarcoma	
20.		**3rd term end exams**	
21.		Blood Banking	
22.		Bleeding disorders – BT, CT, PT Prothrombin time – demonstration	
23.		Urine Examination - I	
24.		Urine Examination - II	
25.		CVS	
26.		Respiratory System	
27.		G I T	
28.		Hepatobiliary system	
29.		Renal system	
30.		Male genital system	
31.		**4th term exams**	
32.		Female genital system, Breast	
33.		Instruments I	
34.		Instruments II	
35.		Charts - I	
36.		Charts - I	
37.		Charts- III	
38.		Endocrine System	
39.		Lymph node	
40.		Musculo skeletal system and CNS	

41.		Revision practicals- Hb,blood grouping, ps study	
42.		Revision practicals- Urine and. Charts,Instruments	
43.		Revision HPR-General pathology	
44.		Revision HPR- CVS,RS,GIT,lymphoreticular.	
45.		Revision HPR- Hepatobiliary,renal,male and female genital system musculoskeletal system & CNS	
46.		1 st Viva-voce Clinical path & haematology	
47.		Journal correction	
48.		2 nd Viva-voce General pathology	
49.		OSPE	
50.		3 rd Viva-voce Systemic pathology-I	
51.		Record book certification	
52.		4th Viva-voce Systemic pathology-II	
53.		.OSPE/ Revision	
54.		OSPE/Revision	
55.		**5th term exam/ Preliminary examinations**	

2hrsx57=114 hrs

Topics for Integrated teaching

1. Shock
2. Rheumatic heart disease
3. Atherosclerosis
4. Ischemic heart disease
5. Hypertension
6. Tuberculosis
7. COPD
8. Nephrotic syndrome
9. Inflammatory bowel disease
10. Cirrhosis
11. Diabetes mellitus
12. AIDS
13. Iron deficiency anemia
14. Jaundice

EVALUATION

Total Marks: 400

Internal Assessment: 80

University Examination: 320

Internal Assessment: Total marks 80(Theory :60 & practical : 20)

Theory:60Marks There would be regular formative assessment. Day to day performance will be given greater significance. Minimum of three sessional examinations shall be conducted. The sessional examination preceding university examination will be similar to the pattern of university examination.

Average of two best marks obtained in the examinations would be taken into consideration for calculating Internal assessment. Weightage will be given to performance in periodic tests ,participation in seminars & research projects. Average marks & marks obtained for day to day assessment will be added and sum of these two be reduced to 60 & sent to the University.

Practical : 20 Marks

There will be three terminal practical examinations. Average of best two marks would be reduced to 15 and marks obtained for Practical records & performance in periodic practical tests will be reduced to 05.

The Internal Assessment Marks both in Theory & Practicals shall be sent to The University at least fifteen days prior to the commencement of Theory Examination.

University Examination

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Distribution of Marks for University Examination

Theory		**Practicals**	**Viva**	**Internal Assessment Theory**	**Internal Assessment Practicals**	**Total**
Paper I (General Pathology and Hematopathology, Clinical paathology)	Paper II (Systemic Pathology)					
100	**100**	**80**	**40**	**60**	**20**	**400**

UNIVERSITY EXAMINATION

A. THEORY PAPERS: 200 MARKS

Two theory papers of 100 mark each, of 3 hours duration
The pattern of questions will be as follows.

Type of questions	**Number of questions**	**Marks for each question**	**TOTAL**
Long essay	**02**	10	20
Short essay	**10**	05	50
Short answers	10	03	30
Total Marks			**100**

The distribution of topics and weightage of marks for university examinations will be as under:

Paper I

1. General pathology- 50 marks
2. Hematology- 30 marks
3. Clinical pathology- 20 marks

Max Marks- 100 Marks

Paper II

1. CVS and RS 20 marks
2. GIT and HBS 20 marks
3. Endo, RES and Breast 20 marks
4. Renal, MGS, and FGS 20 marks
5. B&J, ST, CNS, PNS, Skin 20 marks

Max Marks- 100 marks

The topics assigned to the different papers are generally evaluated under those sections. However a strict division of the subject may not be possible and some overlapping of topics is inevitable. Students should be prepared to answer overlapping topics.

*Long essay question can be split into 3-4 sub questions and marks can be divided accordingly.
Ex- Define neoplasia. Classify the chemical carcinogens. Write about mechanism of chemical carcinogenesis. (2+3+5=10 Marks)

In paper II One long essay question should be clinical problem oriented, with subquestions.

Ex- A 45-year-old man was rushed to the hospital following an episode of crushing substernal chest pain with breathing difficulty. An urgent ECG was done which showed elevation of ST segment with deep Q wave.

a) What may be the possible diagnosis ?

b) What other investigations will you suggest for evaluation of this case ?

c) Enumerate the common complications that may arise in this case (1+7+2=10Marks)

B. PRACTICAL EXAMINATION: 80 MARKS

1) Spotters (OSPE) 10 X 3 mark
(Including slides, specimens, instruments & charts) 30 marks

2) Urine examination with clinical history 10 marks
and findings and interpretations

3) Stained smear given with clinical history 10 marks
for reporting and interpretation

4) Chart: Clinical pathology, Haematology 10 marks
and cytology with interpretation

5) Haemoglobin estimation / Blood grouping 10 marks

6) One histopathology and/ or cytology slide 10 marks

Total practical marks 80 Marks

C. VIVA VOCE EXAMINATION MARKS

1) General pathology 10 marks
2) Clinical pathology and haemotology 10 marks
3) Systemic pathology – I 10 marks
4) Systemic pathology – II 10 marks

Total viva marks 40 Marks

D. RECOMMENDED BOOKS: (Latest edition)

1. ROBBINS and COTRAN: **Pathologic Basis of Disease**
2. HARSH MOHAN: **Textbook of Pathology**
3. WALTER and Israel, **General Pathology**\
4. GOVAN :**Pathology Illustrated**,
5. SABITRI SANYAL: Prep manual for undergraduates- Clinical pathology.
6. JCE UNDERWOOD **: General and Systematic pathology**
7. DR. TEJINDER SINGH, **Textbook of Haematology**
8. EVAN DAMJANOV- Secrets in pathology.

E. REFERENCE BOOKS

1. **Anderson's Pathology**
2. **Oxford Textbook of Pathology**
3. CURRAN, **Colour Atlas of Histopathology**
4. DACIE and Lewis (SM), **Practical Haematology**
5. **Wintrobes Clinical, Hematology**
6. HENRY, **Clinical Diagnosis and Management by Laboratory Method**,
7. Pathology by Rubin and Farber

MICROBIOLOGY

LEARNING OBJECTIVES:

A MBBS student at the end of the microbiology course will be able to:

KNOWLEDGE

1. Describe the mechanisms of host parasite relationship.
2. Enumerate the normal flora and its importance in health and disease.
3. Describe the etiology and pathogenesis of common infectious diseases.
4. List the microbes that cause opportunistic infections in humans and describe their pathogenesis.
5. Explain the importance of National health programmes for the prevention of communicable diseases.
6. Understand the ecology (microbial) of specialized areas like hospital, water, food and prevent the possible spread of infections.

SKILLS

1. Choose appropriate laboratory investigations required for a clinical diagnosis.
2. Sample the right specimen, at the right time, by the right method.
3. Analyze and interpret the results of laboratory tests.
4. Choose the suitable antimicrobial agent for treatment.
5. Apply the principles of immunology in the pathogenesis, diagnosis and prevention of infectious and non-infectious diseases.
6. Practice the techniques of asepsis, antisepsis and sterilization in day-to-day procedures and apply universal precautions in laboratory and clinical practice.

COURSE CONTENTS
THEORY

I. INTRODUCTION

Must know.

Morbidity and mortality data of infectious diseases prevalent in the country with reference to the National Health Programmes and in the local geographic area.

Desirable to know

Significant milestones in the history of Microbiology

II. GENERAL MICROBIOLOGY

Must know

1. Definitions: infections, parasite, host, vector, fomite, contagious disease, infectious disease epidemic, endemic, pandemic, Zoonosis, Epizootic, Attack rate.
2. Normal flora of the human body.

3. Routes of infection and spread; endogenous and exogenous infections; source at reservoir of infections.
4. Bacterial cell. Morphology limited to recognizing bacteria in clinical samples Shape, motility and arrangement. Structures, which are virulence, associated. Physiology: Essentials of bacterial growth requirements.
5. Sterilization, disinfection and universal precautions in relation to patient care and disease prevention. Definition of asepsis, sterilization, disinfection.
6. Antimicrobials: Mode of action, interpretation of susceptibility tests, resistance spectrum of activity.
7. Bacterial genetics and molecular biology.

III IMMUNOLOGY

Must Know

1. Basic principles of immunity immunobiology: lymphoid organs and tissues. Antigen. Antibodies, antigen and antibody reactions with relevance to pathogenesis and serological diagnosis.
2. Humoral immunity and its role in immunity.
3. Cell mediated immunity and its role in immunity.
4. Imunology of hypersensitivity.
5. Measuring immune functions.
6. Immunological basis of the autoimmune phenomena.
7. Immunodeficiency with relevance to opportunistic infections.
8. Basic principles of transplantation immunity
9. Basic principles of tumour immunity.
10. Complement
11. Hypersensitivity
12. Auto immunity
13. Monoclonal antibodies

SYSTEMIC MICROBIOLOGY

IV - BACTERIOLOGY

To be considered under the following headings.
Morphology, classification according to pathogenicity, mode of transmission, methods of prevention, collection and transport of samples for laboratory diagnosis, interpretation of laboratory reports, rapid bedside diagnosis where feasible, list of antimicrobial agents and control measures with special relevance to the National Control and Eradication programmes, in respect of .

Must know

1. Staphylococci,
2. Streptococci and Pneumococci,
3. Neisseriae,
4. Corynebacterium diphtheria
5. Mycobacteria : Tuberculosis, M.leprae, atypical mycobacteria,
6. Enterobacteriaceae,
7. Parvobacteria : Haemophilus, Bordetella, Brucella, Pasteurella, Gardnerella.
8. Vibrois : V.cholerae and other medically important vibrios,
9. Campylobacters and Helicobacters,
10. Pseudomonas,
11. Bacillus anthracis, B.cereus
12. Sporing and non-sporing anaerobes : Clostridia, Bacteroides and Fusobacteria.
13. Chlamydiae : Mycoplasma.
14. Actionmycetales : Actinomycetes and Nocardia.
15. Spirochaetes, Donovania granulomatis
16. Rickettsiae

Desirable to know
Listeria monocytogenes
Mycoplasma
Legionella
Acinetobacter

V - GENERAL VIROLOGY

Must know

General properties: Basic structure and broad classification of viruses. Cultivation of viruses, Pathogenesis and pathology of viral infections, Immunity and prophylaxis of viral diseases. Principles of laboratory diagnosis of viral diseases. List of commonly used antiviral agents. Bacteriophage with relation to virulence mechanism and epidemiology,

Desirable to know
Replication and genetics.

VI - SYSTEMIC VIROLOGY

Must know

1. Herpes viruses: List of viruses included, lesions produced, pathogenesis and latency principles and Laboratory diagnosis.
2. Arbo viruses: List of arboviruses prevalent in India, general properties, mode of transmission, disease syndromes produced, common diagnostic tests, prevention of spread.
3. Picorna viruses : Common infections produced, classification and general properties, pathogenesis of poliomyelitis, immunoprophylaxis of poliomyelitis.
4. Myxoviruses : General properties, classification according to diseases produced, antigenic variations in influenza virus with relevance to vaccine efficacy; measles, mumps and rubella important features and prophylaxis.
5. Rabies virus : General properties; antrabies antemortem diagnosis in rabies and prophylaxis.
6. Hepatitis virus: list of viruses, pathogenesis, mode of infection, list of diagnostic tests and their interpretation, methods of prevention and control.
7. Human immunodeficiency virus; Structure with relevance to laboratory diagnosis and type of infection, laboratory tests and their interpretation. Universal precautions, specific precautions, recent trends in diagnosis and prophylaxis.
8. Rota virus: Laboratory diagnosis.
9. Adenovirus – Infections caused and Laboratory diagnosis.

Desirable to know

1. Slow virus infection.
2. Poxviruses.
3. Oncogenic viruses.
4. Viral haemorrhagic fever

VII - MYCOLOGY

Must know

General properties of fungi. Classification based on disease : superficial, subcutaneous, deep mycoses opportunistic infections including Mycotoxins, systemic mycoses. General principles of fungal diagnosis, Rapid diagnosis. Method of collection of samples. Antifungal agents.

VIII - PARASITOLOGY

1. Terminologies used in parasitology
2. Protozoans: i. Intestinal
   - ii. Genital
   - iii. Protozoans in blood
   - iv. Opportunistic protozoans.
3. Helminths : Cestodes : Taenia, Echinococcus, Hymenolepis
4. Nematodes : Intestinal, Tissue
5. Medical entomology with reference to vectors.

Desirable to know

1. Trematodes of medical importance.

IX - CLINICAL / APPLED MICROBIOLOGY

Must know

1) Streptococcal infections: Rheumatic fever and Rheumatic heart disease, 2) Meningitis. 3) Tuberculosis, 4) Enteric fever, 5) Dysentery, 6) Diarrhoeal diseases, 7) Pyrexia of unknown origin, 8) Eye-infections, 9) leprosy, 10) Sexually transmitted diseases, 11) Poliomyelitis, 12) Hepatitis, 13) Acute-respiratory infections, 14) Central nervous System infections, 15) Urinary tract infections, 16) Pelvic inflammatory disease, 17) Wound infection 18) Opportunistic infections, 19) HIV infection, 20) Malaria, 21) Filariasis, 22) Zoonotic diseases. 23) Food poisoning 24) Hospital acquired infections 25) Bio medical waste and its management.

(Integrated teaching suggested for the above topics)

Desirable to know

1) Bone and joint infections, 2) Exanthematous conditions, 3) Organisms used in bioterrorism.

X Bio-medical Waste: Types, potential risks and their safe management.

SKILLS

Must know

1. Do stool exam for ova and cysts; and hanging drop for Vibrio for Vibrio cholera.
2. Perform and interpret Gram's stain, and Ziehl-Neelsen or modified Ziehl Neelsen's stain.
3. Perform skin scrapings and do a KOH preparation for fungal infection.
4. Do cell counts and gram stain of CSF and other body fluids.
5. Interpret blood smear for parasites like malaria and filarial.
6. Interpret antimicrobial sensitivity reports.
7. Interpret serological tests such as VDRL, ASLO, WIDAL, HIV, Rheumatoid factor, hepatitis and TORCH infections, Treponema pallidum Haemaggltination, Haemagglutination in Virology, Haemagglutination inhibition.
8. Be able to collect and transports following clinical samples for microbiological tests: Blood, pus, urine, CSF, body fluids, stool, sputum, throat swabs and serum.
9. Adopt universal precautions for self precaution against HIV and hepatitis.

TEACHING HOURS
THEORY

No. of hours of teaching: 120 hrs.

1.	Introduction to Microbiology and General Bacteriology	10 hrs
2.	Immunology	20 hrs
3.	Systematic Bacteriology	35 hrs
4.	Virology	20 hrs
5.	Mycology	05 hrs
6.	Parasitology	25 hrs
7.	Applied Microbiology	05 hrs

PRACTICAL
PRACTICAL EXERCISES IN MICROBIOLOGY

The students would perform the following procedures:
i) Gram stain, ii) Ziehl Neelsen stain, iii) Modified Ziehl Neelsen stain, iv) Albert stain, v) Hanging drop vi) Wet mount for stool examination, vii) Iodine mount for stool examination, viii) Lactophenol cotton blue mount for fungus examination, ix) Simple stain.

I - MICROSCOPE

a) Principles and use of compound Microscope in detail
b) Dark ground Microscope
Fluorescent Microscope
Phase Contrast Microscope
Electron Microscope

II - STERILIZATION:

a) Principle, Uses and Demonstration of common sterilization equipment, namely, Autoclave, Hot Air Oven, Serum Inspissator, Arnold Steriliser, Filters.

III - CULTURE MEDIA:

Classification of culture media, Principles, main ingredients and uses of common culture media. Namely-Peptone water, Nutrient Broth, Nutrient Agar, Blood Agar, Chocolate agar, Mac Conkey, Wilson Blair, TCBS, LJ, Potassium telluride, Doreset egg, Loeffler's serum slope, RCM, milk agar, Selenite F-broth, Blood culture broth. Media for Biochemical reaction – Sugar Fermentation, Urease, Citrate, Indole Media with growth of common organisms for demonstration namely Staphylococci, C. diphtheria. Mycobacterium tuberculosis, Salmonella on W.B., Vibrio on TCBS, Mac-Conkey with LF & NLF, Milk Agar with Staphylococci, Proteus on Nutrient Agar, Antibiotic sensitivity – methods & principles.

IV - STAINING AND HANGING DROP:

1. Demonstration of motility by hanging drop method.
2. Gram Stain
3. ZN Stain

V - PARASITIOLOGY:

Examination of faeces for helminthic Eggs, (Round worm, hook worm, whip worm, H. Nana)

VI - APPLIED BACTERIOLOGY:

Demonstration of specimen collection.
Growth on appropriate media
Biochemical reactions.

Appropriate special tests for the lab-diagnosis of common infectious diseases. Namely:

1. Pyogenic Infection
2. Enteric Fever
3. Bacillary Dysentery
4. Cholera
5. U.T.I
6. Infantile Diarrhoea
7. Tuberculosis

VII - DEMONSTRATION OF SEROLOGICAL TEST:
Widal test, VDRL, ELISA, CRP, ASO, RF, WEIL, FELIX TEST.

IX - USES OF LABORATORY ANIMALS:
Rabbit, Guinea pig & Mouse

X - DEMONSTRATION OF SLIDES & INSTRUMENTS

XI - MEDIA & SPECIMENS (DEMONSTRATION)

The following procedures are only for demonstration. Students will interpret results, but need not perform the procedure of tests. Serological demonstration of – WIDAL, VDRL. Haemagglutination. Haemagglutination inhibition Complement fixation. Viral Haemagglutination, ELISA.

XII - INTEGRATED TEACHING:

1. Enteric fever
2. Cholera
3. HIV & AIDS
4. Tuberculosis
5. Hospital infection & Control Measures
6. Malaria
7. Bio-medical waste management
8. Viral hepatitis

The following materials are to be procured for the conduct of practical classes.

i. **SLIDES**

1. Staphylococci
2. Streptococci
3. Gonococci
4. M. tuberculosis
5. M. Leprae
6. C. diphtheriae
7. T. pallidum
8. C. tetani
9. Negative Staining (Pneumococci)
10. Malarial parasite
11. Microfilaria
12. Cyclops
13. Hydatid cyst wall
14. Negri Bodies
15. Molluscum contagiosum
16. Rhinosporidiosis
17. Candida
18. Cryptococcus
19. Aspergillus
20. Penicillium

21. Mucor/Rhizopus
22. Pheumococci
23. Y. pestis
24. Mycetoma – H & E Stain
25. Cestode – Segment

ii. MEDIA

1. Without Growth

Peptone Water, Nutrient broth; Nutrient agar, Blood agar, Chocolate agar, Mac-Conkey agar Wilson & Balir medium T.C.B.S., L.J. Medium Robertson Cooked meat medium Milk agar, Selenite F Broth, Blood culture Broth, Dorset egg medium & Loefflers Serum Slope.

2. **With Growth**:

1. Staphylococcus – albus, aureus on Ntrient agar
2. Staphylococcus – albus, aureus on milk agar
3. Potassium tellurite medium with C. diphtheria
4. L.J. with M. tuberculosis
5. Mac Conkey with LF & NLF
6. Wilson & Blair with growth
7. TCBS with growth
8. Proteus – on Nutrient agar and swarming on Blood agar
9. Sugar fermentation – Indole – Negative & Positive
10. Urease – Negative & Positive
11. Citrate - Negative & Postive
12. Sabouraud's dextrose agar with Candida / Aspergillius
13. Sabourauds Dextrose agar with any Dermatophyte.

iii. LIST OF INSTRUMENTS

1. Seitz filter
2. Candle filter
3. Macntosh filde's jar
4. VDRL slide
5. Widal slide
6. Sterile swab
7. Tuberculin syringe
8. Microtitre plate
9. Inoculation loop
10. Pasteur pipette.

IV. LIST OF SPECIMENS

1. Roundworm
2. Hookworm
3. Whip worm
4. Tapeworm
5. Hydatid cyst

6. Embryonated egg
7. Suckling mouse
8. Guinea worm

V. EXPERIMENTAL ANIMALS:

1. Rabbit
2. Guinea pig
3. Mouse

VI. INNOVATIVE TEACHING METHOD

The students are motivated to prepare models and Flow charts so as to facilitate better understanding the structure of micro organisms and their life cycle.

TERM WISE DISTRIBUTION OF THEORY PORTIONS

III TERM:

GENERAL BACTERIOLOGY, IMMUNOLOGY & SYSTEMATIC BACTERIOLOGY (COCCI)

IV TERM

REMAINING SYSTEMATIC BACTERIOLOGY & PROTOZOOLOGY

VI TERM

HELMINTHOLOGY, VIROLOGY, MYCOLOGY & APPLIED MICROBIOLOGY.

SCHEME OF EXAMINATION

INTERNAL ASSESSMENT

It shall be based on evaluation of assignment, preparation of seminar, clinical presentation Day to Day Assessment (see Annex-I for examples). Regular periodic examinations should be conducted throughout the course. Although the question of number of examinations is left to the institution, there should be a minimum of at least three (3) sessional examinations during Phase – II of the course and average of best two examination marks should be taken into consideration while calculating the marks of the internal assessment. Day to day records should be given importance in the internal assessment. Proper record of the work should be maintained which will be the basis of the basis of all students' internal assessment and should be available for scrutiny.

THEORY : 60 Marks

Minimum of three examinations are recommended. The examination preceding the University examination will be similar to the University examination. The total marks would be 300. Average marks of best of two notified internal examinations should be reduced to 60 and should be sent to the University.

PRACTICAL : 20 Marks

A minimum of three practical tests is to be conducted one at the end of each term Average marks of the best of the two of three terminal examinations shall be reduced to 20 marks and shall be sent to the University.

UNIVERSITY EXAMINATION:

A. WRITTEN PAPER : 200 Marks

There shall be two theory papers of 100 marks each and duration of each paper will be of 3 hours. The pattern of questions would be of three types.

B. PRACTICAL EXAMINATION : 60 Marks

It shall carry 80 marks. The distribution of marks for different components are:

Spotters	10
Gram's Stain	15
Special (ZN or Alb) Stain	15
Parasitology (Stool Examn)	15
Clinical Bacteriology	15
Clinical Virology (Charts) or Clinical Mycology (Slide & Culture)	10

The distribution of topics and weightage of marks for University examination is as under

Paper I: 100 Marks

General Bacteriology	20 Marks
Immunology	30 Marks
Systemic Bacteriology	50 Marks

Paper II: 100 Marks

Virology	30 Marks
Parasitology	40 Marks
Mycology	20 Marks
Applied Microbiology	10 Marks

The topics assigned to the different papers are generally evaluated under those-sections, However a strict division of the subject may not be possible and some overlapping of topics is inevitable. Students should be prepared to answer overlapping topics.

C. VIVA VOCE EXAMINATION : 40 Marks

The Viva – Voce Examination shall carry 40 marks and all examiners will conduct the Viva Voce.

Distribution of Topics & Marks

General Bacteriology & Immunology	10 Marks
Systematic Bacteriology	10 Marks
Virology & Mycology	10 Marks
Parasitology	10 Marks
Total	**4**0 Marks

RECOMMENDED BOOKS (Recent Editions)

1. Ananthanarayan : (Ananthanarayan and Jayaram Paniker's) Textbook of Microbiology, Et. & Orient Longmen Ltd., Chennai.
2. Textbook of Microbiology (Prof. C.P.Baveja) Arya publications New Delhi, Fourth edition.

3. Textbook of Microbiology (Dr. D.R. Arora) CBS publications New Delhi, third edition.
4. Jawetz (Melnick) et al, Medical Microbiology, ed Z Appleton and Lange, USA.
5. Chatterjee (KDC), Parasitology, Chatterjee Medical Publishers, Clacutta.
6. Paniker (C.K.Jayaram), Text book of Medical Parasitology, Jaypee, New Delhi.
7. Textbook of Medical Parasitology by P. Chakraborthy new central book agency Ltd. Kolkata

REFERENCE BOOKS:

1. Green wood, Medical Microbiology, Ed-15 Churchill Livingstone.
2. Roitt (Ivan.M), Essential Immunology, Ed.6, ELBS, Hong Kong.
3. MIMS (Cedric, Playfair) et al, Pathogenesis of Infectious diseases, Academic Press, London.
4. STITES (Terr and Parslow), Medical Immunology, Appleton and Lange USA.
5. MENDELL (Donerglas Aan Benett), Principles and Practice of Infections diseases, Churchill Livingstone
6. BAILEY AND SCOTT, Diagnostic Microbiology, Mosby Publishers
7. MACKIE & MACARTNEY – Vol II (Collee & Duguid) et al, Churchill Livingstone.
8. Basic Laboratory Procedures in Medical Parasitiology, WHO.
9. Basic Laboratory Procedures in Medical bacteriology WHO.

FORENSIC MEDICINE & TOXICOLOGY

(i) Goal

The broad goal of the teaching undergraduate student in Forensic Medicine is to produce a physician who is well informed about medico legal responsibilities in practice of medicine. He/She acquires knowledge of law in relation to medical practice, medical negligence and respect for codes of medical ethics.

(ii) Objectives

(a) Knowledge

At the end of the course, student should be able to:-

Identify the basic medico legal aspects of hospital and general practice

Define the medico legal responsibilities of a general physician while rendering community service either in a rural primary health centre or an urban health center.

- Be able to identify, examine and prepare report or certificate in medico legal cases/situations in accordance with the law of land.
- Able to perform medico legal postmortem and interpret findings and results of other relevant investigations to logically conclude the cause, manner and time since death.
- Be aware of medical ethics, etiquette, duties, rights, medical negligence and legal responsibilities of the physicians towards patient, profession, society, state and humanity at large.

Be aware of relevant legal / court procedures applicable to the medico legal / medical practice

(b) Skills

1. Make observations and logical inferences in order to initiate enquiries in criminal; matters and medico legal problems.
2. Diagnose and treat common emergencies in poisoning and manage chronic toxicity.
3. Make observations and interpret funding at postmortem examination.
4. Observe the principles of medical ethics in the practice of his profession
5. Be able to preserve and dispatch specimens in medico legal / postmortem cases and other concerned materials to the appropriate government agencies for necessary examination.

(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.

COURSE CONTENTS

THEORY

I. Forensic medicine:

Must know

1. History of Forensic Medicine, Definition of forensic medicine and medical jurisprudence, Medical Etiquette.
2. Courts in India and their powers : Supreme Court, High Court, Sessions Court, Additional sessions court, magistrate's court.
3. Court procedures : Summons, conduct money, oath, affirmation, perjury, types of witness, types of examination, recording evidence, court questions, conduct of doctor in witness box, medical examiner system.
4. Medical certification and medico legal reports including dying declaration.

5. Death :
   a. Definition, types : somatic, cellular and brain death.
   b. Natural and unnatural death.
   c. Presumption of death and survivorship.
   d. Suspended animation.
   e. Death certification, cause of death as per international classification of diseases – WHO guidelines.

6. Changes after death :
   a. Cooling of body, Lividity, Rigor mortis, cadaveric spasm, cold stiffening and heat stiffening.
   b. Putrefaction, mummification, adipocere and maceration.
   c. Estimation of time of death.
   d. Embalming.

7. Inquest by police and magistrate.

8. Identification.
   a. Definition, corpus delicti
   b. Identify of living persons; race, age, sex, religion, complexion, stature.
   c. Identification of criminals, unknown persons, dead bodies and remains of a persons by : hair fiber, teeth, anthropometry, dactylography, foot prints, scars, tattoos, poroscopy, DNA finger printings, Super-imposition.

1. Examination of mutilated human remains; Skeletal remains; and exhumation.

2. Medico legal autopsies :
   a. Definition of a medico legal post mortem.
   b. Difference between pathological and medico legal post mortem.
   c. Objectives, procedures, formalities of medico legal autopsies.
   d. Obscure autopsy
   e. Special procedures in suspected poisoning.
   f. Precautions in autopsy of HIV infected body, radiation injury.

3. Mechanical injuries and wounds:
    a. Definition, classification and differentiation of abrasion, contusion, laceration, chop wounds, incised wounds, stab wounds.
    b. Accidents due to vehicles; Primary and secondary impact injury crush syndrome, reconstruction of accidents, railway injuries.
    c. Differences between ante mortem and postmortem injuries.
    d. Weapons; weapons, dangerous weapons and elementary ballistics.
    e. Wounds due to weapons; Injuries by dangerous weapons, fire arm wound blast injuries, stab wounds, incised wound, defense cuts, hesitation cuts self inflicted injuries, fabricated wounds.
    f. Workman's compensation act.
    g. Justifiable homicide, culpable homicide and grievous injury.

4. Examination of an injury case:
    a. Differences between accidental; suicidal and homicidal injuries.
    b. Types of injuries: simple and grievous.
    c. Wound as a cause of death : primary, secondary.
    d. Situation and character of wounds : number, direction, extent and age of injury.
    e. Injuries of various sites.
    Head : Scalp wounds, fracture of skull, coup, contra coup injuries.
    Intracranial haemorrhages, its location and extent. Injury to brain, spinal cord, Thoracic, Abdominal Pelvic viscera,
    f. Wound Certification.

5. Injuries due to physical agents, and their medicolegal importance; cold, heat burns, electricity and lightning.
6. Asphyxial deaths: definitions, causes, types, post mortem appearance and medico legal significance of suffocation, drowning, hanging, throttling, strangulation. Traumatic asphyxia, drowining, Lynching, judicial hanging, bansdola.
7. Death due to malnutrition, neglect.
8. Dowry deaths.
9.
    a) Virginity: Definition and signs. Defloration
    b) Sexual Offences: Rape, Definition, examination of victim and the accused in case of rape, gang rape, custodial rape. Incest, Unnatural Offences – Tribdism, Bestiality, Buccal Coitus, Sodomy.
10. Legitimacy, paternity, disputed paternity, medicolegal significance of impotence. Sterility and artificial insemination; supper-foetation and super-fecundation; atavism; sterilization.
11. Pregnancy and delivery: Pregnancy: signs of pregnancy in the living and in the dead, Delivery: signs of recent and remote delivery in the living and in the dead; Abortion: natural and artificial therapeutic miscarriage; complications of abortion; investigation in deaths due to abortion. Medical termination of pregnancy act of 1971.
12. Infanticide: Definition and Medico legal consideration: viability; determination of the age of the foetus' method of demonstration of centres of ossification rule of Haase, signs of live birth; Hydrostatic test. Maceration, post – mortem finding to differentiate still birth from a live birth. Battered Baby syndrome and Munchausen syndrome by proxy. Sudden infant death and cot death, Precipitate labour.

13. Biological fluids: examination, preservation, dispatch and identification of blood stains by micro chemical, spectroscopic and precipitation test. Blood grouping in disputed paternity; group specific substances;. Hazards of blood transfusion.
14. Seminal stains: examination, identification, collection, preservation, dispatch.
15. Bio-medical Waste: Types, potential risks and their safe management.

Desirable to know
Brief update on recent advances: HLA typing, DNA typing.

II. FORENSIC PSYCHIATRY

Must know

1. Definition, types of mental disorders, lucid interval.
2. Mental Health Act (1987).
3. Diagnosis of Mental illness and feigned mental illness.
4. Testamentary capacity, restraint, insanity with reference to civil and criminal responsibilities, doctrine of diminished responsibility, McNaughten's rule.

III. MEDICAL JURISPRUDENCE

1. Indian Medical Council and State Medicals Councils: their disciplinary control
2. Indian Medical Register rights and privileges of egistered medical practitioner, penal erasure, infamous conduct, and disciplinary committee.
3. Code and law of medical ethics, unethical practice, dichotomy, consumer protection act
4. Professional secrecy, privileged communication.
5. Malpractice; civil, criminal and ethical.
6. Consent, negligence, vicarious liability, the doctrine of Res Ipsa Loquitur, contributory negligence. *Consumer* Protection Act.
7. Duties of a medical practitioner towards his patient and the society.
8. Human organ Transplantation Act of 1994.
9. PNDT Act. (Revised 1994)
10. Sex determination by Amniocentesis.
11. Euthanasia.
12. Torture medicine
13. The Biomedical Waste (Management & Handling) (Second Amendment) Rules, 2000.

IV. TOXICOLOGY

Must know

1. General aspects of poisoning:
   Duties of doctor in cases of poisoni9ng, medicolegal autopsy in poisoning, preservation and dispatch of viscera for chemical analysis. Role of Forensic Science laboratory. Laws related to poisons.
2. Types of poison, diagnosis, principles of therapy and medico legal aspects of;
   a. Corrosive poisons; strong mineral acids like carbolic acid, oxalic acid, Sulphuric acid, Nitric acid, Hydrochloric acid, Alkalies.
   b. Metallic poisons: Lead, Mercury, Copper, Arsenic.
   c. Animal poisons: Snakes, Scorpions, Bees, Wasps.
   d. Deliriants: Dhatura, Cannabis and Cocaine
   e. Somniferous agents: Opium, Morphine and Pethidine
   f. Inebraints: Methyl and ethyl alcohol.
   g. Gaseous poisons: Carbhon monoxide, carbon dioxide, War gases.
   h. Anaesthetic agents: Chloroform and ether.

i. Cardiac poisons: Aconite, Cerebra thevatia and nerium odorum, Oleanders, Hydrocyanic acid.
j. Miscellaneous : Aspirin, Paracetamol, Barbiturates, Diazepam and Antihistamines
k. Insecticides: Organophosphorous compound, Endrin, Kerosene, turpentine, Rodenticides.
l. Food poisoning: Botulism.
m. Organic vegetables: Abrus, Calotropis.

Desirable to know

a. Inorganic non metallic poisons: phosphorous.
b. Metallic poisons: Antimony, Nitrites and Arsenic
c. Vegetable Alkaloids.
d. Spinal poisons : strychnine
e. Paralytic agents.
f. War gases and industrial gases : MIC
g. Sedatives; Chloral hydrate and Bromides.
h. Mechanical Poisons.
i. Drug Dependence.

PRACTICALS

1. Demonstration of ten medico legal autopsies
2. Age estimation from bones, x-rays, dentition
3. Injuries and weapons
4. Examination of intoxicated persons
5. Possible videotape of examination of victim and accused in sexual offences
6. Specimens of poisons

SKILLS

1. Examine & prepare certificates in the following medico-legal situations:
   a) injured patient
   b) sexual offences
   c) determination of age
   d) intoxicated patient
2. Prepare proper certificates of birth and death.
3. Prepare dying declaration
4. Give evidence in a court of law as an expert witness
5. collect and do proper labeling, preservation and dispatch of medico-legal specimens
6. Witness and record the finding and issue a report for a medico legal autopsy
7. Diagnose and manage common acute and chronic poisonings

PRACTICAL EXERCISES

1. Medico Legal Autopsies – Witnessing and recording (10 cases)
2. Age estimation of an individual by Physical, Dental and Radiological examination.
3. Examiantion of skeletal remains
4. Study of:
   a) Lethal Weapons
   b) Wet specimen/models/Photography/Micro slides – Like sperms, Diatoms, Hairs, Human & Animal RBCs.
   c) Poisons
5. Medical certificates/ Medico-legal reports, Physical fitness, sickness and death certificates, injury report, drunkenness, sexual offences.
6. Students should be taken to courts whenever possible to acquaint themselves with the court proceedings.

Note: Practical Exercises conducted shall be entered in the practical record book edited and published by Karnataka Medico legal society.

TEACHING HOURS

III term – 1 hr Theory / week
IV term – 1 hr Theory & 1 Practical / week
V term – 2 hrs Theory & 1 Practical / week
The course will be for 18 months in III, IV and V terms

SCHEME OF EXAMINATION

INTERNAL ASSESSMENT

It shall be based on evaluation of assignment, preparation of seminar, clinical presentation etc., (see Annex – I for examples).Regular periodic examinations should be conducted throughout the course. Although the question of number of examinations is left to the institution, there should be a minimum of at least three (3) sessional examination marks should be taken into consideration while calculating the marks of the internal assessment. Day to day records should be given importance in the internal assessment.

Proper record of the work should be maintained which will be the basis of all students internal assessment and should be available for scrutiny.

THEORY: 30 Marks

Minimum of three examinations are recommended. The examination preceding the University examination will be similar to the University Examination. The total marks would be 30. Average marks of best of two notified internal examinations should be reduced to 30 and should be sent to the University.

PRACTICALS : 10 Marks

Internal Assessment examination for Practicals and allotment of marks for records will be as follows: the total of 10 marks will be first increased notionally to 50. Out of the 50 marks, 40 will be allotted to terminal practical tests and 10 marks for records. Four practical tests shall be conducted each carrying 10 marks. The marks obtained in the four practical tests and records would be reduced to 10 and sent to the University.

UNIVERSITY EXAMINATION:

A. WRITTEN PAPER:100 Marks

There shall be one theory paper of 100 marks. The patterm of questions would be of three types.

Types of Questions	**Number of questions**	**Marks for each question**	**Total**
Long Essay	2	10	20
Short Essay	10	5	50
Short Answer	10	3	30
Total Marks			**100**

The distribution of topics and weightage of marks for University examination is as under*:

Forensic Medicine (I, II & III): **80 Marks**

Toxicology: **20 Marks**

I Forensic Medicine – 1,2,3,4 & III – Medical Jurisprudence	12 Marks
5,6,7,8.	12 Marks
9,10,11	12 Marks
12,13,14,15,	12 Marks
16,17,18.	10 Marks
19,20,21	12 Marks
II Forensic psychiatry	10 Marks
Toxicology	20 Marks

B. PRACTICAL EXAMIANTION: 40 Marks

This will carry 40 Marks. The distribution of marks for different components are:

Age estimation - 10 Marks
X Rays / Bones - 10 Marks
Autopsy questions - 05 Marks
Spotters - 10 Marks
Medical certificates - 05 Marks

C. VIVA-VOCE EXAMINATION: 20 Marks

This will carry 20 marks. All the examiners will examine the candidates.

RECOMMENDED BOOKS:

1. Narayanareddy K. S., The Essentials of Forensic Medicine & Toxicology, 20th Edition, 2001, Published by K. Suguna Devi, Hyderabad.
2. Apurbanandy, Principles of Forensic Medicine, 2nd Edition, 2001, Pages 606, Published by New Central Book Agency.
3. Parikh C. K., Patikh's Textbook of Medical Jurisprudence and Texicology, 7th Edition, 2001, CBS. Publishers, Bangalore.
4. Guharaj P. V., Forensic Medicine, Rs. 140/-, Orient Longman Limited
5. C.A. Franklin, Modi's Medical, jurisprudence and Toxicology, 21st Edition, Rs. 180/- Published by M. Tripathi Private Limited, Bombay.
6. Parikh C.K., Medico Legal Post Mortem in India, Rs. 230/- Published by Medical Publication.
7. Keith Simpson, Bernard Knight, forensic Medicine, Ninth Edition, 1985, ELBS.
8. Pillay V.V., Text book of Forensic Medicine, Paras Publication, III edition, 2004.

* Specification mentioned such as edition, number of pages, cost etc., subject to change with newer edition.

CURRICULUM IN THE SUBJECT OF PHARMACOLOGY

i) Goal

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

ii) Objectives

a) Knowledge

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

1. Describe the pharmacokinetics and pharmacodynamics of essential and commonly used drugs.
2. List indications, contraindications, interactions and adverse reactions of commonly used drugs.
3. Inculcate the use of appropriate drug in a particular disease with considerations to the cost, efficacy and safety for

i) individual needs

ii) mass therapy under national health programmes

4. List the drugs of addiction and their management
5. Classify environmental and occupational pollutants and state the management issues
6. Prescription of drugs in special medical situations such as pregnancy, lactation, infancy and old age.
7. Integrate the concept of rational drug therapy in clinical pharmacology
8. State the principles underlying the concept of 'Essential Drugs'
9. 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:

1. Prescribe drugs for common ailments
2. Recognize adverse reactions and interactions of commonly used drugs
3. Observe experiments designed for study of effects of drugs, bioassay and interpretations of the experimental data.
4. Scan information on common pharmaceutical preparations and critically evaluate drug formations.

c) **Affective domain**

1. The knowledge gained by students and their application in medical practice is assessed by conducting tutorials, viva voce, MCQ & theory tests periodically.
2. Students are also made to visit the wards and follow up the patients for the therapeutic benefit following the treatment& also report any adverse drug events.

d) Integration

Practical knowledge of use of drugs in clinical practiced will be acquired through integrated teaching with clinical departments and pre-clinical departments.

COURSE CONTENTS & TEACHING HOURS

THEORY: **(120-130 hours)**

Theoretical coverage of various aspects of pharmacology will be covered in lectures, tutorials, group discussions, student seminars,self study topics etc. Spread over the three terms of 6 months each. Stress to be given for the basic principles and pharmacotherapeutic basis for clinical use of drugs. The term wise distribution of topics is as given below:

I} TERM (3rd TERM)

General Pharmacology:

I TERM (3rd Term):
A: General Pharmacology **18 hrs**
1. Introduction , Pattern of Theory Exam, Calculation of I. A .Marks
2. History of Pharmacology
3 Definitions & sources of drug, **Pharmacokinetics.**
4. Routes of drug administration.
5. Absorption of drugs.
6. Bioavailability & distribution of drugs.
7. Factors affecting absorption & bioavailability.
8. Metabolism of drug-I
9. Metabolism of drug-II
10. Excretion of drugs.
11. Methods to prolong duration of action of drugs
12. Clinical Pharmacokinetics & Pharmacodynamics**.**
13. Mechanism of drug action- receptor mediated
14. Non receptor mediated drug action.
15. Adverse drug reactions
16. Drug interactions
17. Factors modifying the effects of drugs
18. Clinical Pharmacology.
Desirable to know:

Molecular mechanisms of drug action Rational approach to therapy: Concepts of essential drugs and rational drug prescribing and adverse drug reactions, cost benefits, therapeutic drug monitoring. Drug toxicity, Drug interactions, principles of assay of drugs: Bioassay, radio immune assay etc., Principles of drug development and clinical evaluation of drug.
B: Autonomic Nervous System **11hrs**
19. Introduction & Adrenergic System
20. Catecholamines
21. Non-Cate chol amines
22. Alpha Adrenergic Blocking Drugs
23. Beta Adrenergic Blocking Drugs
24. Cholinergic drugs
25. Anti-cholinesterase Agents
26. Cholinergic Blocking Drugs -I
27. Cholinergic Blocking Drugs –II & Ganglion Stimulating/ Blocking Drugs
28. Skeletal Muscle Relaxants
29. Drug Therapy of Parkinsonism & Other neurodegenerative disorders
Desirable to know 1. Molecular and biochemical mechanisms of action of cholinergic drugs. Adrenergic drugs and their blockers.
C: C.V.S. **09 hrs**
30. Introduction to CVS & Digitalis
31. Digitalis & Pharmacotherapy of Cardiac Failure
32. Pharmacotherapy of Cardiac Arrhythmias-I
33. Pharmacotherapy of Cardiac Arrhythmias-II
34. Vasodilator Drugs &Pharmacotherapy of Angina Pectoris
35. Pharmacotherapy of Hypertension -I
36. Pharmacotherapy of Hypertension -II
37. Pharmacotherapy of shock
38. Hypo lipedemic Agents
D: DIURETICS & ANTIDIURETICS **02 hrs**
39. Diuretics
40. Diuretics & Anti-Diuretic Drugs
Desirable to know 1. Diabetes insipidus.
E: Biogenic Amines & Polypeptides **04 hrs**
41. Histamine and Antihistaminic Drugs
42. 5-Hydroxytryptamine & Antagonists
43. Angiotensin , Kinins, leukotrienes,
44. Prostaglandins & Cytokines
Desirable to know 1. Drugs which release histamine in the body and clinical implications of this property. 2. The sub types of 5-HT receptors and their antagonists. 3. Antioxidants

IInd TERM (4th Term)
F: CENTRAL NERVOUS SYSTEM INCLUDING LOCAL ANAESTHETICS **18 hrs**
45. Introduction to CNS & alcohol.
46. Inhalational G A agents.
47. I.V. Anaesthetic agents
48. Pre-anaesthetic Medication
49. Local anaes thetics
50. Sedatives,& Hypnotics-I
51. Sedatives,& Hypnotics -II ,Pharmacotherapy of Insomnia
52. Drugs effective in Convulsive Disorders-I
53. Drugs effective in Convulsive Disorders -II
54. Opioid analgesics-I
55. Opioid analgesics -II
56. NSAID's –I
57. NSAID's-II
Psychopharmacology:
58. Anti-depressants -I
59. Anti-depressants -II
60. Anti-Psychotic s
61. Drugs used in Mania
62. Drug therapy of Gout. & Rheumatoid Autocoids
Desirable to know 1. Names of hallucinogens: actions and abuse potential of cannabis indica,cocaine and opioids. 2. Other anaesthetics like ketamine and neuroleptic analgesia. 3. The pharmacology of dantrolene and centrally acting muscle relaxants like diazepam, carisoprodol and baclofen.
G : Blood & Blood forming organs: **05 hrs**
63. Coagulants & Anticoagulants
64. Drugs Effective in Iron Deficiency Anemias
65. Drugs Effective in Megaloblastic Anemias
66. Fibrinolytics & Antiplatelet drugs
67. Antiplatelet drugs
Desirable to know 1. Disadvantages of 'shot gun' anti-anemia preparations. 2. Hypolipoproteinemic drugs: mechanisms of action, adverse effects and indications.
H: CHEMOTHERAPY -I **15 hrs**
68. Introduction
69. Sulfonamides & Cotrimoxazole.
70. Beta lactams: Penicillins -I
71. Beta lactams: Penicillins -II
72. Beta lactams: Cephalosporins & Others
73. Aminoglycosides

74. Macrolides & other Antibiotics
75. Broad spectrum Antibiotics: Tetracyclines, Chloramphenicol
76. Fluroquinolones & Chemotherapy of Urinary Tract Infections
77. Chemotherapy of Sexually Transmitted Diseases
78. Chemotherapy of Tuberculosis-I
79. Chemotherapy of Tuberculosis -II
80. Chemotherapy of Leprosy
81. Chemotherapy of Malaria-I
82. Chemotherapy of Malaria-II
IIIrd TERM(5th Term)
I: ENDOCRINES **15 hrs**
83. Introduction & Anterior Pituitary Hormones
84. Thyroid & Anti thyroid Drugs-I
85. Thyroid & Anti thyroid Drugs-II
86. Insulin –I
87. Insulin –II
88. Oral Anti diabetic Drugs
89. Management of Diabetes mellitus
90. Adrenal Cortico Steroids -I
91. Adrenal Cortico Steroids -II & Gonadotropins
92. Estrogens & antiestrogens
93. Progestins & antiprogestins
94. Oral Contraceptive Pills
95. Ovulation Inducing Drugs
96. Androgens, Anabolic Steroids & Anti androgens
97. Calcium, Phosphorus, Magnesium & Fluoride Metabolism, Parathyroid & Vit -D
Desirable to know 1. Hormones and drugs affecting calcium metabolism their therapeutic indications, contraindications and side effects. 2. Importance of drug induced alterations in prolactin levels. 3. Pharmacology of Anterior Pituitary hormones.
J: CHEMOTHERAPY -II **09 hrs**
98. Chemotherapy of Amoebiasis & other Protozoal Infections
99. Chemotherapy Viral Infections -I
100. Chemotherapy Viral Infections -II
101. Chemotherapy of Helminthiasis
102. Chemotherapy of Fungal Infection
103. Chemotherapy of Malignancy-I
104. Chemotherapy of Malignancy-II
105. Chemotherapy of Malignancy-III
106. Bacterial resistance
Desirable to know 1) Methods to circumvent toxic/side effects of chemotherapeutic agents wherever possible. 2) Antiseptics and disinfectants and their uses based on their Pharmacological properties.
K: RESPIRATORY SYSTEM **02 hrs**

107. Pharmacotherapy of Cough & Mucolytics
108. Pharmacotherapy of Bronchial Asthma
Desirable to know 1. Classification of antitussives pharmacological actions, indications, contraindications and their side effects. 2. Expectorants and mucolytic agents: mechanisms of action, indications, side effects and precautions to be taken during their use. Principles of choosing appropriate combination of cough remedies.
L: G.I.T. **04 hrs**
109. Emetics,& Anti emetics
110. Pharmacotherapy of Peptic Ulcer
111. Pharmacotherapy of Constipation
112. Digestives, Carminatives & Appetite suppressants
Desirable to know 1. Drugs used in therapy of ulcerative colitis outlining the pharmacological basis for their use. Side effects, contraindications and precautions during use of these agents
M:DRUGS ACTING ON UTERUS **01 hr**
113. Uterine stimulants & relaxants
N: MISCELLANEOUS: **06 hrs**
114. Metals and their antagonists
115. Immuno modulators
116. Drugs, Pregnancy and the Newborn.
117. Enzymes in Therapy
118. Vitamins and Antioxidants
119. Gases : Therapeutic and Toxic
Desirable to know 1. Heavy metal toxicity and heavy metal antagonists. Management of over dosage with commonly used therapeutic agents.
O: 1. ESSENTIAL DRUGS & RATIONAL USE OF DRUGS **2.** Pharmacovigilance & Pharmacoeconomics

PRACTICALS: **148 – 150 hrs**

The practical training should be made need based. It should be relevant to the future function of a basic doctor as well as make the student to understand some of the theoretical knowledge imparted to them through lectures. Some of the experiments in the experimental laboratory may be done by the students themselves while others can be demonstrated depending upon the local conditions.

I TERM:

PRACTICAL PHARMACY

Mixtures, percentage solutions, ointments, paints, paste, powders, liniments etc. At least one exercise on each of these type of preparations to be done by the students. Exercises done in these are to be asked as practical exercise at the qualifying examination.

1. The students should be trained to identify, handle and explain the use of various dosage forms to the patient.
2. Students should be trained to interpret the label of commercial preparations.

Practicals are conducted as follows:

1. Dosage forms: I, II & III
2. Calculating dosage and percentage of solutions.
3. Counseling for different dosage forms.

II TERM

EXPERIMENTAL PHARMACOLOGY

Experiments designed to elucidate and demonstrate some basic principles like mechanism of drug action, drug antagonism, drug interactions etc. are demonstrated and some done by the students.

Some of the exercise listed below may be suitably utilized / modified for the above purpose.

1. Frog heart preparation to show effect of autonomic drugs on ions (Demo.)
2. Frog rectus preparation to show neuromuscular drugs action (Demo.)
3. Difference in Onset & duration of actions of drugs given by different routes- Rat.
4. Mydriatic, miotic and local anaesthetic effects on rabbit pupil.
5. Demonstration of animal experiment using computer aided Simulation is included in place of isolated tissue.

   Convulsant and anticonvulsant effect in rats (Demo.)

BIOCHEMICAL PHARMACOLOGY:

Identification of the nature of drug. eg: Alkaloids, Glycosides, Steroids, Iodides and Salicylates.

III TERM:

1. Clinical Pharmacology:

a) Clinical problem solving exercises oriented toward drug interaction,
b) Rational drug therapy including WHO essential drugs.
c) Prescription writing for common clinical conditions.
d) Criticize, correct and rewrite the given prescriptions (Therapeutic & drug interactions oriented).
e) Case studies to study rational therapeutics.
f) Analysis of rationality of fixed dose combinations.
g) Critical evaluation of promotional drug literature.
h) Getting conversant with source of drug information.
i) Exercises on Pharmacovigilance and Pharmacoeconomics.

CLINICAL PHARMACOLOGY AND RATIONAL DRUG USE

Must know

1. Principles of prescription writing.
2. Prescriptions of common disorders.
3. Essential drug concept.
4. Drug in children and pregnancy (perinantal pharmacology)
5. Drugs in geriatrics.
6. Drug- drug interactions (with specific examples)
7. Drug resistance
8. ADR monitoring and reporting

Desirable to know

9. Therapeutic drug monitoring
10. Clinical use of drugs in hepatic and renal failure.

BIO-MEDICAL WASTE: TYPES, POTENTIAL RISKS AND THEIR SAFE MANAGEMENT.

SKILLS

1. Plan and institute a line of treatment which is need based, cost effective and appropriate for common ailments taking into consideration:
    a. Patient
    b. Disease
    c. Socioeconomic status
    d. Institutional/ governmental guideline.
2. Identify irrational prescriptions and explain their irrationality.
3. Persuade patients to stick to therapeutic recommendations especially with reference to dosage and duration of therapy and monitor compliance.
4. Warn patients about important side effects of drugs without alarming them.
5. Recognize drug induced untoward effects and take appropriate steps

COMMON AREAS FOR INTEGRATED TEACHING OF PHARMACOLOGY

Sl.No.	Area	Collaborating Department
1.	Drugs in anaesthetic practice	Anesthesiology
2.	Drug therapy of psychiatric disorders	Psychiatry
3.	Principles of rational use of drugs	Medicine,Pediatrtics,Surgery,Obst.&Gynae.
4.	The concept of essential drug	Community Medicine
5.	Therapy of hypertension	Medicine and Physiology
6.	Management of diabetes& its complications	Medicine ,Physiology & Surgery
7.	Therapy of peptic ulcer	Medicine , Physiology, Surgery
8.	Therapy of CCF	Medicine
9.	Therapy of Asthma	Medicine
10.	Therapy of Malaria	Medicine & Microbiology
11.	Therapy of tuberculosis	Medicine & Microbiology
12.	Therapy of Leprosy	Medicine & Microbiology

INNOVATIVE TEACHING METHODS

Students are asked to follow up the patients admitted in our teaching hospital to assess the therapeutic benefit received by them after the treatment

Students are asked to write down the medications received by the patients during their stay in the hospital. They have to refer the text books and write the known adverse effects of those drugs. They have to go back to the patient and mention if they have suffered from any of those adverse effects.

Similarly they have to write adverse effects of drugs taken by them or their parents during their course of study in pharmacology. This will make them understand the importance of monitoring adverse events of drugs.

Students have to estimate the total cost of drugs taken by the patients admitted in our hospital. They have to find out the cost of similar drugs having the same contents and quality & compare with the drugs prescribed to patients. This will expose them to the concept of Pharmacoeconomics and prescribe drugs available at lower cost.

SCHEME OF EVALUATION

Theory papers two of 100 marks each. Practical examination of 80 marks
Internal assessment theory -60 marks Practical 20 marks
Viva voce examination 40 marks Total marks = 400

INTERNAL ASSESSMENT: (IA)

Theory: 50 marks for Term end examination & 10 marks for day today assessment
Theory IA marks (50) based on marks scored in two (best) of three term end examinations
Day today assessment: marks scored in other tests, viva voce, participation in seminars, tutorials & other assignments.
Practical IA marks (20) based on all 3 term end examinations (15) & practical record book (05)
A student has to score a minimum of 35 % marks to be eligible to appear for examination.

UNIVERSITY EXAMINATION

A) WRITTEN PAPER: 200 MARKS.

There shall be two theory papers of 100 marks each and duration of each paper will be of 3 hours.

Type of Questions	Number of questions	Marks for each question
Essay type questions	2	10
Short Essay types questions	10	5
Short answer questions	10	3

Distribution of chapters/ topics for paper I & II with weightage of marks for University Examination is given below:

Paper I: 100 Marks:

1. General Pharmacology including clinical pharmacology 15 Marks.
2. Central Nervous System & Local Anaesthetics 25 Marks.
3. Autonomic Nervous System including Parkinsonism, Skeletal Muscle Relaxants 25 Marks
4. Cardio Vascular System 20 Marks
5. Blood and Pharmacotherapy of shock |
6. Diuretics and Antidiuretics | 15 Marks.

Paper II : **100 Marks.**

1. Chemotherapy 40 Marks.
2. Endocrines (Hormones) 20 Marks.
3. Gastro Intestinal System 10 Marks.
4. Autocoids 10 Marks.
5. Respiratory System
6. Chelating agents 10 Marks.
7. Immunosuppressives
8. Drugs used in GOUT & Rheumatoid Arthritis
9. Vitamins
10. Enzymes in Therapy 10 Marks.
11. Drugs acting on Uterus
12. Antiseptic and Disinfectants

B. PRACTICAL EXAMINATION: I & II (Three hours) **80 Marks.**

Distribution of Marks for Practical Examination

Practical I **40 Marks**.
Spotters 10 Marks.
Prescriptions(1) C.C.R.(1) 10 Marks.
Practical Pharmacy Exercise 20 Marks.

PRACTICAL : II **40 Marks**.

i) Experimental Pharmacology Experiments on intact animals.
ii) Rabbit eye : identification of drugs
iii) Routes of drug administration (Rat)

or

iv) Biochemical pharmacology: Identification of nature of drug. 20 Marks.

Interpretation of Graph 10 Marks.
Clinical Pharmacology Problems (2) 10 Marks

C.VIVA- VOCE EXAMINATION: **40 Marks.**

All the four examiners will examine all the candidates

Distribution of Marks for Viva Voce Examination

1. General Pharmacology, CNS, local anaesthetics, Biogenic amines and polypeptides, Gout and rheumatoid arthritis. 10 Marks.
2. ANS, Parkinsonism, CVS, Blood and Blood forming organs, Hypolipedemic agents, Diuretics. 10 Marks.
3. Endocrines, GIT, Uterus, Respiratory System. 10 Marks.
4. Chemotherapy, Antiseptics and Disinfectants, Chelating agents, Vitamins, Immunopharmacology. 10 Marks.

RECOMMENDED BOOKS

Theory

1. R.S.Satoskar, S.D. Bhandarkar, S.S.Ainapure,Pharmacology and pharmacotherapeutics, 18th Edition Single Volume, M/S Popular Prakashan, 350, Madan Mohan Marg, Tardeo, Bomaby- 400 034.
2. K.D.Tripathi, Essentials of Medical Pharmacology, V.Edition, M/s Jaypee Brothers, Post Box.,7193, G-16 EMCA House, 23/23, Bansari Road, Daryagani New Delhi.
3. Laurence and Bennet, Clinical Pharmacology, ELBS Edition, 9th Edition.
4. Katzung, Basic and Clinical Pharmacology, 9th Edition, Lange Medical Books, McGrawHill Medical Publishing Division.
5. S.D.Seth Textbook of Pharmacology, 2nd Edition. B.I.Churchil Livingstone.

REFERENCE BOOKS:

Goodman & Gilman, The Pharmacological basis of Therapeutics, 10th Edition (International Edition), Toel G,. Hardman Lee E.Limbird.

PRACTICAL

1. R.D.Budhiraja, Manual of Practical Pharmacy, M/s popular Prakashana, Bombay- 34, Pages: 101, Rs. 45/-
2. S.K.Kulkarni, Practical Pharmacology
3. B.P.Jaju, Pharmacology Practical Exercise Book, Jayapee Brothers, P.B.No.:719 G-16 EMCA house, 23/23, B. Ansari Road, Daryaganj, New Delhi.
4. Ravinder Rao, Hand Book of Practical Pharmacology.

SECTION - IV

MEDICAL ETHICS

INTRODUCTION

Medical ethics is a systematic effort to work within the ethos of medicine, which has traditionally been service to sick.

There is now a shift from the traditional individual patient, doctor relationship, and medical care. With the advances in science and technology and the needs of patient, their families and the community, there is an increased concern with the health of society. There is a shift to greater accountability to the society. Doctor and health professionals are confronted with many ethical problems. It is, therefore necessary to be prepared to deal with these problems.

In keeping with its goal to improve quality of education, BLDE University, recommends introduction of medical ethics in the regular teaching of M.B.B.S. course beginning from first year and containing till internship.

OBJECTIVES

The objectives of teaching medical ethics should be to enable to students develop the ability to:

1. Identify underlying ethical issues and problems in medical practice.
2. Consider the alternatives under the given circumstances, and
3. make decisions based on acceptable moral concepts and also traditions practices.

COURSE CONTENTS (SYLLABUS)

1. Introduction to Medical Ethics

   What is Ethics
   What are values and norms
   Relationship between being ethical and human fulfillment.
   How to form a value system in one's personal and professional life
   Heteronomous Ethics and Autonomous Ethics\
   Freedom and personal Responsibility

2. Definition of Medical Ethics

   Difference between medical ethics and bio-ethics
   Major Principles of Medical Ethics

Beneficence	=	fraternity
Justice	=	equality
Self determination (autonomy)	=	liberty

3. Perspective of Medical Ethics

   The Hippocratic oath
   The Declaration of Helsinki
   The WHO Declaration of Geneva
   International code of Medical Ethics (1993)
   Medical Council of India Code of Ethics (2002)

4. Ethics of the Individual

The patient as a person
The Right to be respected
Truth and Confidentiality
The autonomy of decision
The concept of disease, health and healing
The Right to health
Ethics of Behaviour modification
The Physician – Patient relationship
Organ donation

5. The Ethics of Human life

What is human life
Criteria for distinguishing the human and the non-human
Reasons for respecting human life
The beginning of human life
The beginning of human life
Conception, contraception
Abortion
Prenatal sex-determination
In vitro fertilization (IVF), Artificial Insemination by Husband (AIH)
Artificial Insemination by Donor (AID0,
Surrogate motherhood, Semen Intrafallopian Transfer (SIFT),
Gamete Intrafallopian Transfer (GIFT), Zygote Intra fallopian Transfer (ZIFT),
Genetic Engineering.

6. The Family and Society in Medical Ethics

The Ethics of human sexuality
Family Planning perspectives
Prolongation of life
Advanced life directives – The Living Will
Euthanasia
Cancer and Terminal Care

7. Death and Dying

Use of life-support systems
Death awareness
The moment of death
Prolongation of life
Ordinary and extraordinary life support
Advanced life directives
Euthanasia – passive and active
Suicide – the ethical outlook
The right to die with dignity

8. Profession Ethics

Code of conduct
Contract and confidentiality
Charging of fees, Fee-splitting
Prescription of drugs
Over-investigating the patient
Low-Cost drugs, vitamins and tonics
Allocation of resources in health cares
Malpractice and Negligence

1. Research Ethics

Animal and experimental research / humanness
Human experimentation
Human volunteer research – Informed consent
Drug trials

2. Ethical workshop of cases

Gathering all scientific factors
Gathering all human factors
Gathering all value factors
Identifying areas of value-conflict, Setting of priorities,
Working our criteria towards decisions

4. TEACHING / LEARNING EXPERIENCE

Classroom teaching would focus on professional relationship, patient-doctor relationship, issues at the beginning and end of life, reproductive technologies, resource allocation and health policy. It will also deal with values, ethical concepts and principles.

Clinical ethics must be taught as part of bedside teaching group discussions, case studies, problem analyzing and problem solving exercises may also be employed.

Demonstrating by example, how to identify and resolve a particular problem

Increasing the awareness and knowledge of students of the value dimensions of interactions with the patients, colleagues, relations and public.

Fostering the development of skills of analysis, decision making and judgment.

Making the students aware of the need to respect the rights of the patient as also duties and responsibilities of the doctor.

Recommended distribution of Teaching hours in different phases of MBBS Course

Total Teaching Hours : 40

Phase I : Preclinical Period – 6 hours
2 hours each by Anatomy, Physiology, Biochemistry during 1 year.

Phase II : Paraclinical Period - 6 hours
2 hours each from Pharmacology, Pathology and Micribiology.

Phase III : Community Medicine – 4 hours
2 hours each from Ophthalmology and ENT – 4 hours.
2 hours each in two terms from Medicine, Surgery, and OBG = 12 hours
8 hours from other clinical departments.

N.B.: The teaching of Medical Jurisprudence by the department of Forensic Medicine will continue as before.

5. EVALUATION

At least one short answer question may be asked on medical ethics appropriate to the subject in all major subjects in the university question paper. A few questions may be asked during viva voce examination.

6. RECOMMENDED READING

1. Francis C. M., Medical Ethics, 2nd Edn, 2004, Jaypee Brothers, New Delhi, Rs. 25/-
2. Ethical Guidelines for Biomedical Research on Human Subjects, Indian Council of Medical Research, New Delhi, 2000.

SECTION - V

ANNEXURE - I

Different Methods Recommended for Internal Assessment by MCI

The Medical Council of India has given some examples of methods for internal assessment of student, which may be followed by the colleges. They are;

1. Credit for preparation and presentation of seminars by students
2. Preparation of clinical case for presentation.
3. Clinical case study / problems solving exercises.
4. Participation in project for health care in the community
5. Proficiency in conducting a small research project or assignment.
6. Multiple choice questions (MCQ) test after completion of a chapter / system.

Each item shall be objectively assessed and recorded. Some of the items can be assigned as homework/vacation work.

ANNEXURE - II

CATEGORIES OF BIO-MEDICAL WASTE
SCHEDULE-I
(See Rule 5)

**Waste Category No.	Waste Category ** Type	Treatment & Disposal ** Options
Category No. 1	**Human Anatomical Waste** (human tissues, organs body parts)	Incineration[o]/ deep burial*
Category No.2	**Animal waste** (animal tissues, organs, body parts, carcasses, bleeding parts, fluid, blood and experimental animals used in research, waste generated by veterinary hospitals, colleges discharge from hospitals, animal houses)	Incineratin [o]/ deep burial*
Category No.3	**Microbiology & biotechnology Waste** (wastes from laboratory cultures, stocks or specimens of micro-organisms live or attenuated vaccines human and animal cell culture used in research and infectious agents from research and industrial laboratories, wastes from production of biologicals, toxins, dishes and devices used for transfer of cultures.)	Local autoclaving/micro-waving/incineration [o]
Category No.4	**Waste sharps** (needles, syringes, scalpels, blades, glass etc., that may cause puncture and cuts. This includes both used and unused sharps)	Disinfection (Chemical treatment [oo]/auto claving/ micro-waving and mutilation/shredding[aa]
Category No.5	**Discarded Medicines and Cytotoxic drugs** (waste comprising of outdated, contaminated and discarded medicines)	Incineration [o]/destruction and drugs disposal in secured landfills
Category No.6	****Soiled Waste** (items contaminated with blood and body fluids including cotton, dressings, soiled plaster casts, liners, beddings, other material contaminated with blood)	Incineration [o] autoclaving/micro-waving
Category No.7	**Solid Waste** (waste generated from disposable items other than the waste**sharps such as tubings, catheters, intravenous sets, etc.)	Disinfection by chemical treatment [oo] autoclaving/micro-waving and mutilation/shredding[aa]
Category No.8	**Liquid Waste** (waste generated from laboratory and washing, cleaning, housekeeping and disinfecting activities	Disinfection by chemical treatment[oo] and discharge into drains
Category No.9	**Incineration Ash** (ash from incineration of any bio-medical waste)	Disposal in municipal landfill
Category No.10	**Chemical Waste** (chemicals used in production of biologicals, chemicals used in disinfectin as insecticides etc.,)	Chemical treatment[oo] and discharge into drains for liquieds and secured landfill for solids

** As per Bio-Medical Waste (Management & Handling) (Second Amendment) Rules, 2000, dated 2nd June, 2000.

oo Chemicals treatment using at least 1% hypochlorite solution or any other equivalent chemical reagent. It must be ensured that chemical treatment ensures disinfection.

aa Mutilation/shredding must be such so as to prevent unauthorized reuse.

o There will be no chemical pretreatment before incineration. Chlorinated plastics shasll not be incinerated.

* Deep burial shall be an option available only in towns with population less than five lakhs and in rural areas.

COLOUR CODING AND TYPE OF CONTAINER FOR DISPOSAL OF BIO-MEDICAL WASTES

SCHEDULE – II

(See Rule 5)

Colour Coding	Type of Container	Waste Category	Treatment Options as per Schedule-I
Yellow	Plastic bag	Cat. 1, Cat.2, Cat.3, Cat.6.	Incineration/deep burial
Red	Disinfected container/plastic bag	Cat.3, Cat.6, Cat.7.	Autoclaving/Micro-waving chemical Treatment.
Blue/White Translucent	Plastic bag/puncture proof container	Cat.4, Cat.7.	Auto claving/Micro-waving/Chemical Treatment and destruction/shredding
Black	Plastic Bag	Cat.5, and Cat.9 and Cat.10 (solid)	Disposal in secured landfill

Notes:

1. Colour coding of waste categories with multiple treatment options as defined in Schedule-I shall be selected depending on treatment option chosen, which shall be as specified in Schedule-I
2. Waste collection bags for waste types needing incineration shall not be made of chlorinated plastics.
3. Categories 8 and 10 (liquid) do not require containers/bags.
4. Categories 3 if disinfected locally need not be put in containers/bags.

BLDE UNIVERSITY

Ordinance Governing M.B.B.S. Degree Course Curriculum

(Revised Curriculum 2012 Batch onwards)

Phase III Part I & II : Clinical Subjects

Published by

B.L.D.E. UNIVERSITY

(Declared as Deemed to be University u/s 3 of UGC act, 1956, vide notification No.F.9-37/2007-U.3 (A) dated 29-2-2008, of the MHRD, Government of India)

The Constituent College

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MEDICAL COLLEGE, HOSPITAL AND RESEARCH CENTRE
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B.L.D.E. UNIVERSITY

(Declared vide notification No. F.9-37/2007-U.3 (A) Dated. 29-2-2008 of the MHRD, Government of India under Section 3 of the UGC Act,1956)

The Constituent College

SHRI. B. M. PATIL MEDICAL COLLEGE, HOSPITAL AND RESEARCH CENTRE

BLDEU/REG/GEN/2012-13/ 845 September 20, 2012

NOTIFICATION

Sub: Revised Curriculum for the MBBS Degree – 2012

Ref: 1. Medical Council of India Regulation on Graduate Medical Education, 1997 and subsequent amendments of the same from time-to-time.
2. Minutes of the meeting of the Academic Council of the University held on April 11, 2012.
3. Minutes of the meeting of the BOM of the University held on May 23, 2012.

The Board of the Management of University is pleased to approve the curriculum for MBBS Degree course at its meeting held on May 23, 2012.

The revised curriculum shall be effective from the Academic Session 2012-13 onwards, for MBBS degree course in the constituent College of the University viz Shri. B. M. Patil Medical College Hospital and Research Centre from the academic session 2012-13 onwards.

REGISTRAR
REGISTRAR.
BLDE University, Bijapur.

To,
The Dean, FoM & Principal
BLDE University's
Shri. B. M. Patil Medical College, Hospital and Research Centre,
BIJAPUR.

Copy to:
1.Secretary UGC New Delhi.
2.Controller of Examinations, BLDE University, Bijapur.
3.Prof. & HOD's Pre Para & Clinical departments.
4.PS to Hon'ble President, BLDE University.
5.PS to Hon'ble Vice Chancellor, BLDE University.
6.Office Copy

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BLDE UNIVERSITY

Vision and Mission

- Committed to provide globally competitive quality medical education.
- To provide the best health care facilities in this backward region, in particular, to socially disadvantaged sections of the society.
- Constantly striving to become a reputed research University with world-class infrastructure, latest tech-tools for teaching/research and adopting global best practices.

Objectives

- To provide for instruction and training in such branches of learning as it may deem fit.
- To provide for research and for the advancement of and dissemination of knowledge.
- To undertake extramural studies, extension programmes and field outreach activities to contribute to the development of society.
- To do all such other acts and things as may be necessary or desirable to further the objects of the Institute.
- To provide education in medical and health sciences or any other branches that will imbibe humane qualities in our students in order to enable them to practice medical and health care prudently and equitably.
- To endeavor to improve quality of undergraduate and postgraduate education by providing necessary infrastructure and learning resources required.
- To encourage use of learner oriented methods that would cultivate logical thinking, clarity of expression, independence of judgment, scientific habits, problem solving abilities, self initiated self directed and life learning.
- To encourage innovations in education, teaching methods, student assessment and in extension service.
- To provide educational experience that allow hands-on- experience both in institutional as well as in community setting.
- To encourage development of scientific temper, acquire educational experience for proficiency in profession and promote healthy living.
- To constantly display sensitivity and respond to changing educational, social, and community needs.

- To enable students to become exemplary citizens by observation of moral and ethical code of conduct and fulfilling social and professional needs as to respond to national aspirations.
- To plan and implement transparency and accountability in governance of academic and administrative activities.
- To promote staff student welfare programmes.
- To promote public private partnership in various fields including health care.
- To provide for interaction in training and research programs with concerned National or International institutes such as University / Board / R & D Organizations / Centers of excellence such as ICMR, AIIMS, NIMHANS, etc.,
- To introduce the short-term courses for award of PG Diploma and certificates in the University.
- To evolve distance education programs or modularly designed programs leading to degrees that can be awarded on a credit-accumulation basis in the Deemed University system.
- To create an academic and administrative structure in tune with the changing needs of the society, so as to enable the growth of each institution of the University into a center of excellence.
- To promote and sustain international collaborations with institutions, including twinning programs and award of degrees/diplomas.
- To bring in all aspects of creative human activities in medical and allied sciences such as art.
- To organize and promote conferences, seminars, lectures, public debates and exhibitions in matters relating to education.
- To give awards, prizes and scholarships to promote the objectives
- To form centers at convenient places and promote the objectives
- To promote education research, training and professional development in medical, Bio-medical or any other branches of education.
- To collaborate with individuals or universities outside India for the purpose of research, education and extension of knowledge.
- To assist the Government in the formation and implementation of policies relating to health promotion.
- To promote educational activities in habitat related environmental issues such as human waste management, hospital and other medical waste management.
- To promote educational activities in habitat related environmental issues such as pollution, energy and conservation.

Introduction

The revised M.B.B.S curriculum of The Medical Council of India (MCI) came into effect from May 1997 and it has undergone amendments thereof. The BLDE University has implemented the new regulations for the batches of students admitted to the M.B.B.S course from the academic year 2008-09 and onwards.

University will implement the revised curriculum for the batches of students admitted to the M.B.B.S Course from the academic year 2012-13 onwards.

These regulations recommend the following:

1) That the medical curriculum should be oriented towards educating students to take up the responsibilities of physicians of first contact. The medical graduate should be capable of functioning independently in both urban and rural environment of our country and internationally.

2) Every effort should be made to provide educational experience that allows hands-on-experience both in hospital as well as in community setting. For this purpose, a comprehensive list of clinical skills that a graduate must acquire at the end of the course including internship has been prepared.

3) That maximum effort is made to encourage integrated teaching and every attempt be made to de-emphasise compartmentalization of disciplines so as to achieve horizontal and vertical integration in different phases.

4) That educational experience should emphasise health rather than only disease, and community orientation also instead of only hospital orientation. Population control and family planning should also be given due emphasis.

5) Due importance to be given to teaching common problems of health and disease and to the national programmes.

6) That every effort should be made to use learner oriented methods which would encourage cultivation of logical thinking, clarity of expression, independence of judgment, scientific habits, problem solving abilities, and self-directed learning.

7) Reduction of "didactic lectures (not more than 1/3 of total teaching hours) and increasing use of active methods of learning such as group discussion seminars, role play, field visits, demonstrations, peer interactions etc. which would enable students to develop personality, communication skills and other qualities which are necessary.

8) Examinations be designed with a view to assess not merely the knowledge but also practical and clinical skills, habits and values which are necessary for a graduate to carry out professional day to day work competently.

9) Regular periodic assessment to be done throughout the course for internal assessment. The assessment need not be limited to written tests. It should relate to other items such as maintenance of records, participation in seminars and group discussions, clinical case study, proficiency in carrying out practical or clinical skill or participation in projects and assignments (even) during vacation. These be evaluated objectively and recorded.

10) That every medical institution should evolve institutional objectives, which would be in consonance with the national goals (See Section II) and health policy. The institutional objectives should describe the attributes of their product.

11) Shift in the role of medical teachers from mere imparting knowledge to that of a facilitator and motivator of student learning.

12) That every medical college establishes a medical education unit for faculty development, preparation of learning resource materials and improved evaluation methods.

13) That every medical college should have curriculum committee which would plan curricula and instructional method which would be updated regularly.

With advances in science and technology, integration of ICT in teaching learning process is required and be implemented.

Doctors are confronted with many ethical issues and problems. It is necessary for every doctor to be aware of these problems. The doctors need to be trained to analyze the ethical problems and deal with them in an acceptable manner. It is recommended that teaching of medical ethics be introduced in phase I and continued throughout the course including the internship period.

Awareness regarding history of medicine is necessary to understand the developments.Teaching of History of Medicine to be incorporated in the course .

BLDE University endorses these recommendations and strongly desires to implement them while conducting the MBBS course.

SECTION - I

Objectives of Medical Education

(As stated in MCI Regulations, 1997)

This section contains the goals and general objectives of graduate medical education as stated in MCI Regulations, It is desired that in consonance with these national goals, each medical college should evolve institutional objectives.

(1) NATIONAL GOALS:

At the end of undergraduate programme, the medical student shall endeavour to be able to:

(a) Recognise 'health for all' as a national goal and health right of all citizens and by undergoing training for medical profession fulfill his/her social obligations towards realization of this goal;

(b) Learn every aspect of National policies on health and devote himself/herself to its practical implementation;

(c) Achieve competence in practice of holistic medicine, encompassing primitive, preventive, curative and rehabilitative aspects of common diseases.

(d) Develop scientific temper, acquire educational experience for proficiency in profession and promote health living.

(e) Become exemplary citizen by observation of medical ethics and fulfilling social and professional obligations, so as to respond to national aspirations.

(2) INSTITUTIONAL GOALS

The undergraduate students coming out of a medical institution should:

(a) Be competent in diagnosis and management of common health problems of individual and the community, commensurate with his/her position as a member of the health team at the primary, secondary or tertiary levels, using his/her clinical skills based on history, physical examination and relevant investigations;

(b) Be competent to practice preventive, promotive, curative and rehabilitative medicine in respect to the commonly encountered health problems;

(c) Appreciate for different therapeutic modalities, be familiar with the administrations of the "essential drugs" and their common side effects;

(d) Be able to appreciate the social-psychological, cultural, economic and environmental factors affecting health and develop humane attitude towards the discharging one's professional responsibilities.

(e) Possess the attitude for continued self learning and to seek further expertise or to pursue research in any chosen area of medicine, action research and documentation skills.

(f) Be familiar with the basic factors, which are essential for the implementation of the National Health Programs including practical aspects of the following:-

- i) Family Welfare and Maternal and Child Health (MCH)
- ii) Sanitation and water supply,
- iii) Prevention and control of communicable and non-communicable diseases,
- iv) Immunisation,
- v) Health Education;
- vi) IPHS standard of health at various levels of service delivery and medical waste disposal.
- vii) Organizational institutional arrangements

(g) Acquire basic management skill in the area of human resources, materials and resource management related to health care delivery, general and hospital management, principal inventory skills and counseling.

(h) Be able to identify community health problems and learn to work to resolve these by designing, instituting corrective steps and evaluating outcome of such measures.

(i) Be able to work as a leading partner in health care teams and acquire proficiency in communication skills.

(j) Be competent to work in a variety of health care settings.

(k) Have personal characteristics and attitude required for professional life such as personal integrity, sense of responsibility and dependability and ability to relate to or show concern for other individuals.

(l) All efforts must be made to equip the medical graduate to acquire the detailed in Appendix B of Medical Council of India Regulations on Medical Education, 1997.

[Source:GME Regulations amended up to February 2012]

SECTION - II

REGULATIONS GOVERNING M.B.B.S. DEGREE COURSE

(Eligibility for Admission, Duration, Attendance and Scheme of Examination.)

1. ELIGIBILITY

1.1 Qualifying Examination

Student seeking admission to first MBBS course:

i) shall have passed two year Pre University examination conducted by Department of Pre University Education, Karnataka State, with English as one of the subjects and Physics, Chemistry and Biology as optional subjects. The candidate shall have passed subjects of English, Physics, Chemistry and Biology individually.

OR

ii) shall have passed any other examination conducted by Boards / Councils / Intermediate examination established by State Governments / Central Government and recognized as equivalent to two year Pre University examination by the BLDE University / Association of Indian Universities (AIU), with English as one of the subjects and Physics, Chemistry and Biology as optional subjects and the candidate shall have passed subjects of English, Physics, Chemistry and Biology individually.

OR

iii) shall have passed Intermediate examination in Science of an Indian University / Board / council or other recognized examining bodies with Physics, Chemistry and Biology, which shall include a practical test in these subjects and also English as compulsory subject. The candidate shall have passed subjects of English, Physics, Chemistry and Biology individually.

OR

iv) shall have passed first year of the three year degree course of a recognized University with Physics, Chemistry and Biology including a practical test in these subjects provided the examination is an 'University Examination' provided that the candidate shall have passed subjects of English, Physics, Chemistry and Biology individually in the Pre University or other examinations mentioned in the clauses above.

OR

v) shall have passed B.Sc. Examination of an Indian University, provided that he/she has passed the B.Sc. examination with not less than two of the following subjects: Physics, Chemistry, Biology (Botany, Zoology) provided that candidate has passed subjects of English, Physics, Chemistry and Biology individually in the qualifying examinations mentioned in clauses (i) (ii) and (iii).

Note: Candidates who have passed "Physical Science" instead of Physics and Chemistry as two separate subjects are not eligible for admission to MBBS course as per Medical Council of India Regulations vide letter MCI-37(2)/2001/Med.922 dated 14.02.2001

1.2 Marks

The selection of students shall be based on merit provided that:

a) In case of admission on the basis of qualifying examination, a candidate for admission to MBBS course must have passed individually in the subjects of Physics, Chemistry, Biology and English and must have obtained not less than 50% marks for general category,40% for SC,ST and OBC students taken together in Physics, Chemistry and Biology in the qualifying examination.

The minimum marks shall not be less than 45% taken together in Physics, Chemistry and Biology for physically handicapped candidates with lower limb locomotor disability of 40 to 70%.

b) The student shall appear for the competitive entrance examination conducted by the BLDE University, must have come in the merit list prepared as a result of such competitive entrance

examination by securing not less than 50% marks for general. category,40% for SC,ST and OBC category students and 45% for candidates with lower limb locomotor disability of 40 to 70%. in Physics, Chemistry and Biology taken together in the competitive examination.

1.3 **Age:** The candidate should have completed 17 years of age on or before 31st day of December of the year of admission.

DURATION OF THE COURSE

i) Every student shall undergo a period of certified study extending over $4^1/_2$ Academic years from the date of commencement of this study for the subject comprising the medical curriculum to the date of completion of the examination followed by one year compulsory rotating Internship.

The $4^1/_2$ years course has been divided into three Phases.

1. **Phase – I** – 1 year, consisting of two terms of 6 months each.
2. **Phase – II** - $1^1/_2$ years, consisting of three terms of 6 months each
3. **Phase – III** - 2 years, consisting of 4 terms of 6 months each.

ii) The first year shall be occupied in the study of the Phase - I (Pre Clinical) subject of Human Anatomy (650 hours), Physiology including Bio Physics (480 hours), Bio Chemistry (240 hours) and Introduction to Community Medicine (60 hours). A detailed syllabus is given in later Section.

iii) After passing pre-clinical subjects in Phase – I, the Phase – II shall be 3 terms ($1^1/_2$ years), devoted to Para clinical and Clinical subjects. Para Clinical subjects shall consist of Pathology, Pharmacology, Microbiology, Forensic Medicine including Toxicology and part of Community Medicine. During this phase the clinical subjects shall be taught concurrently. The clinical subjects taught will be Medicine and its allied specialties, Surgery and its allied specialties and Obstetrics and Gynecology.

iv) Phase – III Part-I consists of Community Medicine, ENT and Ophthalmology.

v) Phase – III Part-II consists of Medicine, Pediatrics Surgery and their allied specialties, Obstetrics and Gynecology.

ACADEMIC TERMS

All candidates admitted beyond the last date stipulated by the University shall have to appear for I Professional Examination to be held subsequent to the regular examination after completion of the prescribed duration.

ATTENDANCE

Every candidate should have attendance not less than 75 % of the total classes conducted in theory, practical and clinical jointly in each calendar year calculated from the date of commencement of the term to the last working day as notified by the University in each of the subjects prescribed to be eligible to appear for the University Examination. (vide Medical Council of India Notification on Graduate Medical Education (Amendment) Regulations 2003, published in the Gazette of India Part III, Section 4, Extraordinary issued on 15th October 2003)

The Principal should notify at the college the attendance details at the end of the each term without fail under intimation to this University.

The candidate lacking in the prescribed attendance and progress in any subject(s) in theory or practical/clinical in the first appearance should not be permitted to appear for the examination in that subject(s).

Teaching Hours and Hospital Postings

Number of teaching hours allotted for various subjects are as under:

Table 1:- Theory Lectures, Demonstrations and Seminars etc.

SUBJECTS	HOURS
General Medicine -	300 hours
Pediatrics	100 hours
Tuberculosis and Chest diseases	20 hours
Psychiatry	20 hours
Skin & STD	30 hours
Community Medicine	50 hours
Anaesthesia	20 hours
General Surgery	300 hours
Orthopedics	100 hours
Ophthalmology	100 hours
Oto-Rhino-Laryngology	70 hours
Radiology (includes Radio-diagnosis & Imaging and Radiotherapy)	20 hours
Dentistry	10 hours
Obstetrics & Gynaecology - 300	300 hours

Clinical Course: Hospital Postings.

During third to ninth terms, clinical postings of three hours duration daily as specified in Table 2 is suggested for various departments, after introductory course in Clinical Methods in Medicine and Surgery of two weeks each for the whole class at the start of 3rd term.

Table 2: **Hospital Postings**

SUBJECT	WEEKS							TOTAL
Terms	3rd	4th	5th	6tb	**7th**	**8th**	**91h**	
Gen. Medicine	6	-	4	-	4	6	6	26
Paediatrics	-	2	-	2	2	4	-	10
TB & Chest Diseases	-	2	-	-	-	-	-	02
SKIN & STD	-	2	-	2	-	2	-	06
Psychiatry	-	-	2	-	-	-	-	02
Radiology	-	-	-		2	-	-	02
Gen. Surgery (c)	6	-	4	-	4	6	6	26
Orthopedics	-	-	4	4	-	-	2	10
Ophthalmology	-	-	4	4	2	-	-	10

Otorhinolaryngology	-	-	-	4	4	-	-	08
OBGY including FWP	2	4	4	-	4	4	6	24
Corn. Medicine	4	4	-	4	-	-	-	12
Casualty	-	-	-	2	-	-	-	02
Dentistry	-	-	-	-	2	-	-	02
Total	18	22	18	22	20	22	20	142

a) This posting includes exposure to laboratory medicine and infectious diseases.
b) This posting includes training in Radio-diagnosis and Radiotherapy where existent.
c) This posting includes exposure to dressing and Anesthesia.
d) This posting includes exposure to Rehabilitation and Physiotherapy.
e) This includes maternity training and the 3d semester posting shall be in Family Welfare Planning.

Scheme of Examination

Internal Assessment

It shall be based on evaluation of assignment, presentation of seminar, clinical a Clinical presentation etc., (see Annex — I for examples). Regular periodic examinations should be conducted throughout the course. Although the question of number of examinations left to the institution, there should be a minimum of at least three (3) sessional examinations during the course. One of these tests can be in the form of MCQS.One of the practical/clinical examination can be in the form of OSPE. Average of best two examination marks should be taken into consideration while calculating the marks of the internal assessment. Day-to-day records should be given importance in the internal assessment.

Proper record of the work should be maintained, which will be the basis of internal assessment of all students and should he available for scrutiny.

Weightage for internal assessment shall be 20% of total marks in the subject.

A student must secure at least 35% of total marks fixed for internal assessment in a particular subject in order to be eligible to appear in the University Examination of that subject. (Vide Medical Council of India Notification on Graduate Medical Education (Amendment.) Regulations 2003, published in the Gazette of India Part III, Section 4.

Extraordinary issued on 15th October 2003).

Assistant Professor and above or lecturer with five years of teaching experience can conduct internal assessment examination.

Theory

Minimum of three examinations is recommended. The examination preceding the University examination may be similar to the University examination. The marks allotted for internal assessment for different subjects is shown in Table 3 and 4. Average marks of best of two notified internal examinations should be reduced to the marks allotted for internal assessment for each subject and should be sent to the University.

Practical / Clinical

A minimum of one clinical test may be conducted at the end of each ward postings in all the clinical subjects. At least two ward leaving tests in Ophthalmology and Otorhinolaryngology and three ward leaving tests in Medicine, Surgery and Obstetrics and Gynecology are recommended. Average of best two examination marks should be taken into consideration while calculating the marks of the internal assessment.

Assistant Professor and above or lecturer with five years of teaching experience can conduct internal assessment examination.

The internal assessment marks of both theory and practical obtained by the candidates should be sent to the University atleast fifteen days prior to the commencement of theory examination.

University Examination - Subjects and Marks

Third Professional examination - Part I: Seventh term: Ophthalmology, Otorhinolaryngology and Community Medicine.
Third Professional examination - Part 11: (Final Professional) 9th term: Medicine. Surgery, Obstetrics & Gynecology and Paediatrics.

The distribution of marks for theory and practical / clinical examination for various subjects of Phase III, Part — I and Part II are shown in Tables - 3 and 4.

Eligibility to appear in Phase III Examination

a) A student who fails in the II professional examination shall not be allowed to appear in III professional part I examination unless he/she passes all subjects of II professional examination.

b) Passing in III Professional - Part I examination is not compulsory before entering for 8th and 9th term training, however passing of II Professional - Part I examination is compulsory for being eligible for III Professional Part II examination.

Criteria for Pass

For declaration of pass at the University examination, a candidate shall pass both in Theory and Practical/Clinical Examinations separately in the same examination, and as stipulated below:
A candidate must obtain 50% marks in aggregate with a minimum of 50% marks in Theory including viva-voce and minimum of 50% marks in Practical / Clinical, in each of the subjects.

A student has to secure marks as follows to pass in a subject:

i) **35% in internal assessment (for eligibility to appear for University examination)**
ii) **50% of the total marks for Theory with Orals (only externals)**
iii) **50% of the marks of Practical / Clinical (only externals)**
iv) **50% of the aggregate (total of externals and internals)**

A candidate not securing 50% marks in aggregate in Theory or Practical/Clinical examination in a subject shall be declared to have failed in that subject and is required to appear for both theory and Practical/Clinical again in the subsequent examination in that subject.

Table — 3: **Distribution of** Marks **for university Examination of Part-I Subjects**

Subject	**Community Medicine**	**Ophthalmology**	**Otorhinolaryngology**
A. Theory 1.Written Paper. No. of Papers & Maximum marks for each paper	2 x 100 = 200	1 x 100 =100	1 x 100= 100

2.Viva-Voce (Oral Examination)	40	20	20
3.Internal Assessment (Theory)	60	30	30
Total Theory	**300**	**150**	**150**
B. Practical I Clinical			
1. Practical / Clinical	80	80	80
2. Internal Assessment (Practical)	20	20	20
Total Practical/Clinical	**100**	**100**	**100**
Grand Total	**400**	**250**	**250**

Table 4: Distribution of Marks for University Examination of Part — II Subjects

	Pediatrics	**Medicine**	**Surgery**	**Obstetrics & Gynaecology**
A. Theory Written paper No. of papers & Maximum marks for each paper	1x100=100	2x100=200	2x100=200	2x100=200
1. Viva voce (Oral Examination)	20	40	40	40
2. Internal Assessment (Theory)	30	60	60*	60
Total Theory	**150**	**300**	**300**	**300**
B. **Practical / Clinical**				
1. Practical/ Clinical	80	160	160	160
2. Internal Assessment (Practical)	20	40	40*	40
Total Practical I Clinical	**100**	**200**	**200**	**200**
Grand Total	**250**	**500**	**500**	**500**

Note : The Internal Assessment for Surgery shall consist of 45 marks for General Surgery and 15marks for - Orthopaedics in Theory component and 30 marks for General Surgery and 10 marks for orthopaedics in clinical component.

Declaration of Class.

a. A candidate having appeared in all the subjects in the same examination and passed that examination in the first attempt and secures 75% of marks or more of grand total marks prescribed will be declared to have passed the examination with distinction.

b. A candidate having appeared in all the subjects in the same examination and passed that examination in the first attempt and secures 65% of marks or more but less than 75% of grand total marks prescribed will be declared to have passed the examination in First Class.

c. A candidate having appeared in all the subjects in the same examination and passed that examination in the first attempt and secures 50% of marks or more but less than 65% of grand total marks prescribed will be declared to have passed the examination in Second Class.

d. A candidate passing a university examination in more than one attempt shall be placed in Pass class irrespective of the percentage of marks secured by him/her in the examination.

[Please note fraction of marks should not be rounded off for clauses (a), (b) & (c).

SECTION III

COURSE CONTENTS
(PHASE Ill, PART I)

OPHTHALMOLGY

Goal :

The broad goal of the teaching of students in Ophthalmology is to provide such knowledge and skills to the student that shall enable him/her to practice as a clinical and as a primary eye care physician and also to function effectively as a community health leader to assist in the implementation of National programme for the prevention of blindness and rehabilitation of the visually impaired.

Objectives

Knowledge

a) At the end of the course the student have knowledge of

1) Common problems affecting the eye
2) Principles of management of major ophthalmic emergencies
3) Main systemic diseases of affecting the eye
4) Effects of local and systemic diseases on patients vision and the necessary action required to minimize the sequelae of such diseases.
5) Adverse drug reactions with special reference to Ophthalmic manifestations
6) Magnitude of blindness in India and its main causes
7) National programme for control of blindness and its implementation at various levels
8) Eye care education for prevention of eye problems
9) Role of primary health centre in organization of eye camps
10) Organization of primary health care and the functioning of the Ophthalmic assistant.
11) Integration of the nation programme for control of blindness with the other national health programmes.
12) Eye Bank Organization

b) Skills at the end of the course students shall be able to perform are:

1. Elicit history pertinent to general health and ocular status.
2. Assist in diagnostic procedure such as visual acuity testing, examination of eye, schiotz tonometry, staining for corneal pathology confrontation Perimetry subjective refraction including correction of presbyopia and aphakia, direct ophthalmoscopy and conjunctival smear examination and cover test.
3. Diagnose and treat common problems affecting the eye.
4. Interpret ophthalmic signs in relation to common systemic disorders
5. Assist / observe therapeutic procedures such as sub conjunctival injection, corneal conjunctival foreign body removal, carbolic cautery for corneal ulcers, nasolacrimal test syringing and tarsorraphy
6. Provide first aid in major ophthalmic emergency
7. Assist to organize community surveys for visual check up.
8. Assist to organize primary eye care service through primary health centres.
9. Use ellective means of communication with public and individual to motivate for surgery in cataract and from eye donation
10. Establish rapport with his seniors colleagues and para medical workers so as to effectively function as member of the eye care team.

c) Integration the under graduate training in ophthalmology will provide an integrated approach toward disciplines' especially neurosciences. Otorhino-laryngology. General surgery and medicine.

Examination skills

Skills	Able to perform independently	Able to perform under guidance	Assist	Observe
1. Visual acuity test and use of pinhole(including light projection)	✓			
2. Color vision test		✓		
3. Visual field by confrontation	✓			
4. Harschberg rest to detect obvious squint	✓			
5. Examination of ocular movements	✓			
6. Assessment of corneal sensation	✓			
7. Flourescein staining to identify corneal abrasion		✓		
8. Assessment of anterior chamber depth	✓			
9. Papillary size and reaction	✓			
10. Distant direct ophthalmoscopy pupils to diagnose lens opacities		✓		
11. Method of direct ophthalmoscopy		✓		
12. Schiotz's tonometry	✓			
13. Regurgitation for NLD block.				✓
14. Syringing				✓
15. Instillation / ointment		✓		
16. Irrigation of conjunctiva		✓		
17. Applying an eye patching				✓
18. Epilation of cilia				✓
19. Eversion of upper eye lid	✓			
20. Use of lid retractors to examine the eye of child			✓	
21. Digital tonometry	✓			
22. Removal of foreign body				✓
23. Entropion surgery				✓
24. Cataract surgery				✓
25. Glaucoma surgery				✓
26. Keratoplasty				✓
27. Chalazion/ stye				✓
28. Tarsorraphy			✓	
29. Phoria/tropia / BSV, preliminary knowledge of cranial nerves II,III,IV,VI	✓			
30. Assessment of opacity in the media	✓			

Course Contents:

Theory

I) Introduction

II) Basic Sciences

1) Anatomy: Development of the eye .
Coats of the eye
Blood supply, Nerve supply of the eye
Pupillary pathways, Visual pathways
Extra – Ocular muscles. Ocular motor nerves

2) Physiology: Physiology of vision.
Tear film
Aqueous humor formation.

3) Pharmacology: Ophthalmic preparation and routes of administration.
Antibiotics, Antivirals and Anti- Fungal drugs.
Cycloplegics, antiglaucoma drugs.

4) Pathology: Histopathology of Retinoblastoma, Malignant melanoma. squamous cell carcinoma etc.

5)Elementary Optics: Reflection, refraction, Optical system of Normal eye, Reduced eye, Strum's conoid, Estimation of Refraction.

III) DISEASE OF THE EYE

1) CONJUNCTIVA

MUST KNOW

Acute infective conjunctivitis: Bacterial conjunctivitis- purulent conjuctivitis,
Ophthalmia neonatorum: Membranous conjuctivitis
Chlamydial conjunctivitis- Trachoma.
Viral conjunctivitis.
Allergic conjunctivitis: Simple,Phlyctenular,Conjunctival Degenerations: Pterygium,pinguecula,Concretions.

DESIRABLE TO KNOW

Chronic conjunctivitis, Inclusion conjunctivitis, Pseudomembranous conjuctivitis, Mucocutaneous diseases affecting conjunctiva. Conjunctival tumours.

2) CORNEA

MUST KNOW

Corneal ulcer: Etiology, clinical features, complications and treatment of baterial,
Viral and fungal corneal ulcers.
Vitamin A deficiency and keratomalacia.
Exposure Keratitis,
Neuroparalytic keratitis,
Interstitial keratitis: Aetiology, Clinical features and treatment.
Basics of Eye donation and Keratoplasty.

DESIRABLE TO KNOW

Other forms of deep keratitis.
Degenerations and dystrophies of cornea, Keratoconus
Kerato - refractive surgery.

3) SCLERA

MUST KNOW

Clinical features and differantial diagnosis, investigations and treatment of Episcleritis and Scleritis.

DESIRABLE TO KNOW

Scleromalacia perforans,Blue sclera .

4) UVEAL TRACT

MUST KNOW

Classifications of Uveitis
Acute anterior uveitis - Aetiology,clinical features,complications differential Diagnosis and management .
Purulent uveitis: Endophalmitis, Pan Ophthaslmitis.

DESIRABLE TO KNOW

Association of systemic disease in uveitis, Chronic uveitis,cyclitis, Posterior uveitis
Degenerative changes in the tract.Congenital anomalies- coloboma of Iris and Choroid.

5) LENS

MUST KNOW

Classification of cataract
Senile cataract : Aetiology,clinical features and evaluation.Differential diagnosis from open angle glaucoma.Surgical management of cataract,and complications of cataract surgery.
Aphakic corrections Intra – ocular lens implantation,Congenital cataract –types.
Awareness of Amblyopia, assessment and early reference .
Degeneration and opacities

DESIRABLE KNOW

Other forms of cataract – complicated,Traumatic,Metabolic,Toxic and after cataract.
Recent advances in cataract surgery - phacoemulsification

6) VITREOUS

Vitreous detachment,Asteroid hyalosis,Synchysis scintillans,
Vitreous haemorrhage – causes and treatment.

7) GLAUCOMA

MUST KNOW

Classification
Angle closure glaucoma : Risk factors, mechanism' clinical features and management,
Open angle glaucoma : Risk factors,cardinal signs,medical and surgical treatment.
Differebtial diagnosis from cataract.
Congential glaucoma : Clinical features and management .

DESIRABLE TO KNOW

Secondaly glaucomas – Lens induced, Inflammatory, Neovascular, Traumatic, Intraocular tumours, steroid induced.

8) RETINA

MUST KNOW

Fundus changes in ; Diabetes mellitus, Hypertension, Toxemia of pregnancy, Renal diseases, Haematological diseases, AIDS, Myopia.

Diabetic Retinopathy _ Risk factors,assessment and treatment,role of Laser Photo-coagulation.

Retinal vascular diseases _ CRAO, CRVO, Eale's disease.

Retinal detachment - Risk factors, clinical features, treament .

DESIRABLE TO KNOW

Retinal degeneration - Retinitis pigmentosa, Familial lipid degenerations

Retinal infections - Toxoplasma, Toxocara,CMV.

Other: Phacomatosis.

9) OPTIC NERVE

MUST KNOW

Papilloedema : Aetiology and fundus picture differential diagnosis from papillitis

Papillitis : Aetiology and fundus picture,Retrobulbar neuritis

Optic atrophy – primary, secondary, Vascular, Glaucomatous.

DESIRABLE TO KNOW

Toxic amblyopia, optic nerve coloboma.

10) INTRA – OCULAR TUMOURS

Retinoblastoma- Clinical features and treatment, differential diagnosis of leucocoria

Malignant melanoma – Clinical features and treatment.

11) SQUINT

Classification

Differentiation of paralytic and non-paralytic squint,types,aetiology,assessment and principlaes of management of concomitant squint.

Awarness of Amblyopia,assessment & early reference.

12)ORBIT

Causes of Epiphora

Aetiology, clinical features and treatment of Orbital cellulitis and cavernous sinus thrombosis

Common tumours of the orbit.

13) LACRIMAL SYSTEM

Causes of Epiphora

Aetiology, clinical features, complications and Management of congential and acquired acute and chronic Dacryocystitis

Dry Eye – Diagnosis and management

14) LIDS

Inflamations – Blepharitis, Hordeoclum

Anomalies in the position – Trichiasis, entropion, Ectropion, Symblepharon, Ankyloblepharon, Lagophthalmos, ptosis, Tumours of the lids.

15) REFRACTIVE ERRORS

MUST KNOW

Types, Clinical presentation & optical correction of Myopia, Hypermetropia, Astigmatism, Ankyloblepharon, presbyopia, Aphakia.

DESIRABLE TO KNOW-

Anisometropia, Anisokonia,Anomalies of Accomodation & Convergence.

16) INJURIES

MUST KNOW

Perforating injuries : Mechanical effects, immediate and late complications including Sympathetic ophthalmitis and Endophthalmitis. Immediate management and referral

Contusion Injuries : Mechanical effects, delayed complications and referral, chemical Burns, Immediate first aid, assessment and referral.

DESIRABLE TO KNOW

Other forms of injuries, industrial, retained intraocular foreign body.

Medico Legal Aspects of Injuries.

17) OPHTHALMIC SURGERY

Cataract surgery

Glaucoma operations .

Enucleation, Evisceration, Excenteration, Dacryocystectomy,

18**) COMMUNITY OPHTHALMOLOGY**

Definition and types of blindness.

Causes of blindness .

Objective of NPCB and Trachoma control project.

Organisation of ophthalmic screening and cataract surgery camps.

19) MISCELLANEOUS

Symptomatic disturbance of vision.

Hemianopia, Amblyopia,Amaurosis, Night blindness, colour blindness, word-blindness, Malingering.

Ocular emergencies- trauma, chemical burns, acute congestive glaucoma, endophthalmitis, sudden loss of vision. Investigative Ophthalmology – Ophthalmic ultrasound, computerised visual field testing, ERG,VEP,CT Scan.

CLINICAL TEACHING DURING POSTING

Clinical posting in batches during 5th,6th and 7th SEMESTER – 60 sessions of 3 hrs each .

5th term - 4 weeks

6th term – 4 weeks

7th term – 2 weeks

Theory Lectures 30 hrs and Tutorial 60 hrs , Seminar 10 hrs total 100 hrs

INNOVATIVE TEACHING:

6th /7th term students are posted for eye camp once their postings Slow learners are taken special classes, MCQ and seminars will conducted for fast learners..

SCHEME OF EXAMINATION

INTERNAL ASSESSMENT

Theory : 30 marks

There shall be at least two theory examination. The marks obtained should be reduceds to 30 and sent to the university. Minimum 35% Internal Assessment marks are necessary to be eligible to appear for university exam.However there is no weightage of internal assessment marks for passing theory paper. Candidate has to score minimum 50% in theory including viva voce.

Clinical : 20 marks

Clinical examination shall be held at the end of each clinical posting.One of the clinical examination can be OSCE.The marks obtained for clinical examination shall be reduced to 20 and sent to the university. Candidate has to score minimum 35% to be eligible to appear for university examination. Candidate has to score minimum 50% in practical and 50% in theory independently to pass the examination.

University Examination

i) Written Paper

Theory One paper. Duration - 3 hours. Maximum marks - 100

Theory type of questions distribution of marks shall be :

Q.No. I – Long essay questions	….. 2 x 20 marks	= 20
Q.No. II - Short Essay questions	….. 10 x 5 marks	= 50
Q.No.III - Short answer type of questions	….. 10 x 3 marks	= 30
	Total	100

ii) Clinical Examination

Clinical Examination of 2 cases ….. 80 marks

iii) Viva – Voce ….. 20 marks

Total 100 marks

Teaching schedule and hours allotted

Sl.No.	Topics	Lectures (30x1 hr)	Tutorials (20x3hrs)	Seminars (5x2hrs)
1	Basic science	2 hrs	3hrs	
2	Disease of Conjunctive	2hrs	3 hrs	
3	Disease of Cornea & Sclera	2hrs	6hrs	
4	Disease of Uvea	2hrs	6hrs	
5	Disease of Lens	2hrs	6hrs	
6	Glaucoma	2hrs	6hrs	
7	Disease of Retina & Vitreous	2hrs	3hrs	
8	Disease of Optic Nerve	1hr	3hrs	
9	Squint & Neuro-Ophthalmology	2hrs	3hrs	
10	Disease of Orbit	1hr	3hrs	
11	Disease of Eye Lids	1hr	3hrs	
12	Disease of Lacrimal Apparatus	1hr	3hrs	
13	Refractive Errors and Presbyopia	2 hrs	3hrs	
14	Ocular Injuries	2hrs	3hrs	
15	Community Ophthalmology	2hrs	3hrs	
16	Miscellaneous	2hrs	3hrs	
17	Miscellaneous a) Ocular neoplasms. b)Ocular emergencies c)Ocular Pharmacology d) Ocular surgeries e) Recent Advances. f) Systemic diseases (T.B.,Syphilis,Leprosy) g) D/D of red eye	2hrs		
	Total	30hrs	60hrs	10hrs

TEXT BOOKS OF OPHTHALMOLOGY

1. Parsons Disease of the eye, 21st Ed Revised by Dr. Ramanji Sihoti and Radhika Tandon, Published by Butterworth – Heinemann, Elsevier.

2. Text of Ophthalmology by Khurana, 5thEd 2012 published by new Age International P. Ltd

3. Clinical ophthalmology by Kanski, 7th Ed Published by Elsevier.

4. Systemic Ophthalmology by Kanski.

5. Text book of Ophthalmology by NEMA 6th edition.

Otorhinolaryngology & Head & Neck Surgery

A. **Goals**

The goal of training in this subject is to make the candidate familiar with common problems. He should be competent enough to diagnose and treat routine problems. He should be in a position to identify the cases, which require specialist care and identify the deaf individuals at the earliest and refer them for proper rehabilitation.

B. **Objectives**

At the end of the course, the student should :

- know the common problems related to the subject of ENT
- be competent to evaluate the symptoms, analyze the findings, diagnose the malady and suggest and implement the treatment modalities to treat the common ENT conditions.
- perform emergency life saving procedures commonly seen in ENT practice
- be aware of the Program on prevention of deafness and have knowledge of methods for screening for early detection of hearing loss.
- have the attitude, communicative skills, adapt to changing trends in education, learning methods and evolve new diagnostic and therapeutic techniques in the subject of ENT
- know the rational use of pharmaco-therapeutic agents used in treating ENT diseases and have the knowledge of the common side effects and interactions of commonly used drugs.

Knowledge

1. Describe surgical anatomy and physiology of the Ear, Nose and Throat and Head and Neck
2. Describe basic pathophysiology of common ear, nose and throat diseases and emergencies.
3. Suggest common investigative procedures and their interpretation.
4. Describe common infective conditions of ENT and treat them.
5. Identify congenital deafness as early as possible.

Skills

1. Examine and diagnose common problems of Ear, Nose and Throat region and manage at first aid level of care.
2. Recognize premalignant and malignant cases of head and neck region at an early stage.
3. Remove foreign bodies in the ear and nose.
4. Perform life saving procedures like tracheostomy.
5. Should be familiar with drainage of intraoral and neck abscesses.
6. Able to do anterior and posterior nasal packing to control epistaxis.

Integration

NEUROSURGERY- Knowledge of intracranial complications caused by diseases of ENT region, meningitis, intracranial abscesses, cavernous sinus thrombosis.

OPHTHALMOLOGY- Knowledge of orbital complications of sinonasal disease.

General Surgery- General principles of surgical treatment like wound healing, acid base balance, blood transfusion and sterilization.

C. **Course Contents**

Diseases of Ear

Must know

Surgical anatomy : external, middle and inner ear.

Physiology of hearing and vestibular function.

Examination of the Ear: Tuning Fork tests; hearing assessment in children-broad outline, referred pain in the ear, otalgia tinnitus.

Functional examination of inner ear (vestibule): caloric test, positional nystagmus test

Deafness: Types and causes

Diseases of the external ear: perichondritis, otitis externa, cerumen, foreign body, furunculosis keratosis.

Diseases of middle ear

Must know

- Acute and Chronic suppurative otitis media, Obturans, Otitis media with effusion, Otosclerosis, Cholesteatoma**.**
- Audiometry – pure tone

- Complications of otitis media; Mastoiditis (acute and chronic), lateral Sinus thrombosis, labyrinthitis, otogenic brain abscess.
- Mastoidectomy-principles.

Deaf mutism.

Diseases of inner ear,

Good to know

- .Meniere,s disease
- Tumours of the ear – Glomus tumours, Acoustic neuroma.

Diseases of Nose and para nasal sinuses (PNS)

Must know

- Surgical anatomy and physiology of nose and P.N.S including olfaction.
- Congenital diseases of the Nose, Cleft lip and palate and Choanal Atresia.
- Diseases of external nose-furunculosis, vestibulitis, Rhinophyma, rodent ulcer.
- Trauma, nose & PNS-fracture of nasal bones, blowout fracture of orbit, fracture of maxilla with Lefort's classification
- Foreign body in the nose-Classification of foreign bodies & management of animate and inanimate foreign bodies, Rhinolith.
- Causes of epistaxis and management
- Diseases of nasal septum-Haematoma, abscess, DNS, perforation.
- Diseases of nasal cavity- Acute rhinitis, Nasal Diphtheria, Granulomatous conditions of the nose, allergic, allergic rhinitis, vasomotor rhinitis, atrophic rhinitis, fungal infections of nose and paranasal sinuses.
- Diseases of PNS: Acute and Chronic sinusitis. Complications of sinusitis and management.
- Sino nasal polyposis – Diagnosis and management.
- Basic principles of FESS (Functional Endoscopic Sinus Surgery)
- Tumours of the nose and PNS-Benign tumours like papilloma, inverted papilloma, fibrous dysplasia. Malignant tumours like squamous cell carcinoma, Melanoma, Olfactory neuroblastoma.

Diseases of the Nasopharynx

Good to know

- Surgical anatomy and physiology of nasopharynx
- Nasopharyngeal carcinoma-diagnosis and management.
- Adenoid – diagnosis and management.
- Juvenile angiofibroma: Diagnosis and management

Diseases of the Pharynx

- Surgical anatomy and physiology of oral cavity, oropharynx, tonsils, Waldeyer's ring, Anatomy of retropharyngeal and parapharyngeal spaces.
- Physiology of mastication.
- Diseases of the tonsils: acute and chronic tonsillitis, Vincent's angina, Diphtheric tonsillitis diagnosis and management.
- Neck space infections and abscess- Retropharyngeal, parapharyngeal abscess, peritonsillar abscess, Ludwig's angina.

Surgical anatomy and physiology of salivary glands, submandibular Sialadenitis, Salivary calculi, Parotits, tumours of salivary glands.

Diseases of the Larynx

Must know

- Surgical anatomy and Physiology of Larynx with reference to phonation and respiration.
    - Acute infection of the larynx – Acute laryngitis, LTB, Diphtheretic, Acute epiglottitis.
    - Stridor – Causes of stridor and management.
    - Chronic infections of Larynx – Chronic nonspecific and specific laryngitis, granulomatous conditions of larynx.
    - Neurological infections of larynx-Cord palsy-Diagnosis and management.
    - Tumours of larynx-Diagnosis of laryngeal tumours and management.

Diseases of Trachea and oesophagus

Good to know

- Surgical anatomy of trachea, stridor, tracheostomy in detail.
- Oesophagus

- Surgical anatomy, physiology of deglutition.
- Causes of dysphagia, diagnosis and management.
- Diseases such as congential atresia, injuries (traumatic and chemical),
- Foreign body in Oesophagus ,Oesophagoscopy, Neurologic Indication for Oesophagoscopy and Ca Oesophagus.
- Bronchoscopy – Indication, contraindication and complications of foreign body in bronchus.

BIO-MEDICAL WASTE**:** Types, potential risks and their safe management.

Teaching hours

Theory: 70 hours including 48 hours of **tutorials**

Ear-28hours,Nose-21hours,Throat-21hours

Clinical :Total 8 weeks, 4weeks each in 6^{th} and 7^{th} terms.

Integrated teaching; each batch will have 3 classes of 3 hours duration each during tutorials

Innovative teaching methods; mind mapping, website teaching, student feedback system, remedial coaching for slow learners and student adaptation system are done.

Scheme of examination

Internal Assesment

Theory : 30 marks

There shall be at least two theory examinations one at the end of VI term and another

during VII term. The marks obtained should be reduced to 20. 10 marks may be demarcated for day to day work, skill acquired, sincerity, punctuality, analytical ability and communication skills.

Clinical : 20 marks

It should be based on Log book in which records of at least 10 case are maintained for which 5 marks be allotted and clinical examination and log book should be reduced to 20 and sent to the university.

UNIVERSITY EXAMINATION

1) Written paper

There shall be one theory paper of one hour duration carrying 100 marks. It shall have three types of questions:

1) Long Essay Questions-2 Questions 10 marks each = 20

2) Short Essay Questions-10 questions 5 marks each = 50

3) Short Answer Questions-10 questions 3 marks each= 30

The average of two evaluations by separate examiners may be taken as final marks.

2) Clinical Examinations

One Internal Examiner & One External Examiner will examine as follows:

Clinical examination - two cases [40 marks for each case=80 marks)

3) Viva Voce : 20 marks

a) Instruments +Viva : 10 marks

b) X rays +Viva : 10 marks

RECOMMONDED BOOKS

1. Logan Turner's Diseases of ENT, edited by AGB Maran(Wright). 10th edition, Butter worth. K.M Verghese and Company, Bombay, Rs.425.

2. Dhingra. P.L Diseases of Ear, Nose and Throat. 4th Ed. Churchill Livingstone.

3. Mohd. Maqbool, Textbook of ENT Diseases. 8th Ed. Jaypee Brothers.

4. Synopsis of Otolaryngology- John Ballantine

REFERENCES

1. Scott-Brown's Otolaryngology.

2. Ballenger's Text book of Otorhinolaryngology.

COMMUNITY MEDICINE

I. GOALS

The goal of teaching Community Medicine is to prepare medical students (undergraduates) to function as a Community and Primary Care Physicians.

The student should be able to apply the clinical skills to recognize and manage common health problems including their physical, emotional and socio-economical aspects at the individual, family and community level and deal with public health emergencies.

The student should realize the importance of doctor as a team leader and develop the qualities required to lead a health team.

He should be able to interact & communicate efficiently and bring the necessary behavioural changes so as to improve & maintain the health of the members of the community.

II. OBJECTIVES:

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

1) Organize elementary epidemiological studies to assess the health problems in the area.

2) Prioritize the most important problems and help formulate a plan of action to manage them under National Health Programme guidelines including population control and family welfare program. (He/She should be a ble to assess and allocate resources, implement and evaluate the programmes).

3) Demonstrate knowledge of principles of prevention and control of communicable and non-communicable diseases.

4) Organize health care service for special group like mother, infants, under five children and school children, handicapped, adolescents and geriatrics, rural, tribal and urban slum dwellers.

5) Organize health care in case of disasters/emergencies.

6) Inculcate values like compassion, empathy, honesty, sincerity and integrity to ensure high quality ethical professional practice.

7) Work as an effective leader of the health team within the primary health care set-up.

8) Must be able to maintain liaison with various agencies. (Government, non-government and voluntary organizations) involved in providing health.

9) Plan and implement health education programmes.

10) Perform administrative functions of health centers.

11) Promote community participation especially in areas of disease control and implementation of national programmes.

12) Understand different types of Bio-medical waste, their potential risks and their management.

II. OBJECTIVES :

a) KNOWLEDGE :

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

1) describe the health care delivery system including rehabilitation of the disabled in the country;

2) describe the National Health Programmes with particular emphasis on maternal and child health programmes, family welfare planning and population control;

3) list epidemiological methods and describe their application to communicable and non-communicable diseases in the community or hospital situation;

4) apply biostatistical methods and techniques;

5) outline the demographic pattern of the country and appreciate the roles of the individual, family, community and social cultural milieu in health and disease;

6) describe the health information systems;

7) enunciate the principles and components of primary health care and the national health policies to achieve the goal of 'Health for All' ;

8) identify the environmental and occupational hazards and their control;

9) describe the importance of water and sanitation in human health;

10) to understand the principles of health economics, health administration, health education in relation to community.

b) SKILLS :

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

1. use epidemiology as a scientific tool to make rational decisions relevant to community and individual patient intervention;

2. collect, analyse, interpret and present simple community and hospital based data;

3. diagnose and manage common health problems and emergencies at the individual, family and community levels keeping in mind the existing health care resources and in the context of the prevailing socio-cultural beliefs;

4. diagnose and manage maternal and child health problems and advise a couple and the community on the family welfare planning methods available in the context of the national priorities;

5. diagnose and manage common nutritional problems at the individual and community level;

6. plan, implement and evaluate a health education programme with skill to use simple audio-visual aids;

7. interact with other members of the health care team and participate in the organization of health care services and implementation of national health programmes.

c. INTEGRATION:

Develop capabilities of synthesis between cause of illness in the environment of community and individual health and respond with leadership qualities to institute remedial measures for this.

PHASE – II

TERM – III

1. Concept in Health and Disease including Medical Sociology
2. Environment and Health, including Biomedical Waste management
3. Occupational Health
4. Nutritional Health
5. Genetics and Health
6. Screening for Diseases
7. Demography

Total No. Theory– 40 Hours Practical : 40 Hrs.

TERM – IV

1. General Epidemiology including infectious disease epidemiology.
2. Epidemiology of Communicable Diseases
3. Maternal & Child Health.

Total No. of Hrs – 40 Practical : 40 Hrs.

Community Posting of 1 month of 3 Hrs duration

TERM-V

Specific Epidemiology

1. School Health Services
2. Epidemiology of Non-Communicable Diseases
3. Geriatrics

Total No. of Hrs – 12

PHASE – III

Term – VI

1. Health Education & National Health Programme.
2. Mental Health
3. Planning & Management & Disaster Management
4. National Health Policy
5. Health Information System
6. Health Care in the Community.
7. International Health.
8. Epidemology of non communicable diseases.

Total No. of Hours – 60

PRACTICAL

PRACTICALS/CLINICO-SOCIAL

1. Spotters from nutrition, environmental health and entomology, helminthes and Parasites, Occupational health, Immunization, MCH & FP devices, etc.
2. Problem solving exercises including epidemiology and biostatistics.
3. Clinico-Social case studies of common communicable diseases, non-communicable conditions and MCH & FP beneficiaries.

Theory Classes in Total Hours : 227

Term	Topics	No. of Hours
I	1. Medicine and Social Sciences	7
III	2. Man & Medicine,	4
	3. Concept of Health & diseases,	6
	4. Nutrition & Health.	8
	5. Seminars	8
	6. Environmental Health,	8
	7. Occupational Health,	4
	8. Genetic & Mental Health	2
	Total	**40**
IV	1. Preventive medicine in Obstetrics, Paediatrics & Geriatrics	11
	2. Nutrition	2
	3. Epidemiology,	16
	4. Screening,	2
	5. Mental Health	1
	6. Demography & Family Planning	4
	7. Seminar	4
	Total	**40**
VI	1. Planning and Management	6
	2. Health information system	2
	3. Communication for health education	5
	4. International Health	2
	5. Health Programmes in India	13
	6. Hospital Waste Management	1
	7. Health Care of the community	2
	8. Epidemiology of Communicable diseases	9
	9. Epidemiology of Non-communicable diseases.	4
	10. Disaster Management	1
	11. Occupational Health	7

	12. Seminar	8
	Total	**60**
VII	Test & Viva **Total**	80
	Grand Total	**227**

Practicals Classes in Total Hours : 135

Term	**Topic**	**No. of Hours**
I	**Field Visits :**	
	UHTC, ICTC, MRS, Boothnal Tank, Hospital Waste Management, Incinerator Room, Sterilization Unit, RHTC,	
	Total	**30**
III	1. Entomology	15
	2. Nutrition	15
	3. Family Planning	15
	4. Water related problems	12
	Total	**57**
VI	1. Statistics	30
	2.Occupational Health	3
	3. Immunization	15
	Total	**48**
	Grand Total	**135**

Block Posting / Clinico Social Study

Total 180 Hours Approximately:

Medico Social Case 60 Hours	**Epidemiological Problems 60 Hours**	**Family Health Study/ Visits 60 Hours**
Introduction to MSCS	TB	Briefing of ICDS
TB	TB Indices	Visit to Anganawadi Center
_do_	Odds Ratio	Briefing of PHC
Malaria	Vaccine Requirement	Visit to PHC
_do_	_do_	Briefing of Water works

Hypertension	ARI	Visit to water purification
_do_	Food Poisoning	Briefing of Meteorological Stn.
Diabetes	Rabies	Visit to Meteorological Stn.
_do_	Contraceptive Failure Rate	Briefing of DTC
ANC	Secondary Attack Rate	Visit to DTC
_do_	Cholera	Briefing of Catering Estbl.
PNC	Vaccine Efficacy	Visit to Sainik School
_do_	DHF	Record Correction
PEM/GE	PIH	Introduction to F H S.
_do_	Leprosy	Family Health Study
Leprosy	Filaria Indices	_do_
_do_	Relative/Attributable Risk	_do_
ARI	Sensitivity & Specificity	_do_
_do_	Malaria	_do_
Hepatitis	_do_	_do_
_do_	Record Correction	Diet Calculation
Record Correction	_do_	Record Correction
Test	_do_	PPT of Family Health Study
Test	Test	Viva

PRACTICAL

PRACTICALS/CLINICO-SOCIAL

Block Posting of 3 months during 7th Term

Total 180 Hours Approximately:

A. One month posting of Medico Social Case constituent of

1) Public Health Importance communicable diseases like TB, Malaria, Leprosy, Diarrheal diseases etc.
2) Public Health Importance non communicable diseases like – Diabetes, Hypertension etc.
3) Obstetric & Gynecology cases Antenatal Care, Postnatal Care.

B. One month posting of Epidemiological Problems constituent of TB indices, Vaccine requirement, contraceptive failure rate, vaccine efficacy.

C. One month posting of Family Health Study and Visits.

1) One family will be allotted to students for period of 10 days to assess the socio economic status, housing conditions, nutritional status & individual health assessment of each family members.
2) Visits to public health important places like: PHC, ICDS Centre, Water Purification Centre, Catering establishment etc.

3.Spotters from nutrition, environmental health and entomology, helminthes and Parasites, Occupational health, Immunization, MCH & FP devices, etc.

4. Problem solving exercises including epidemiology and biostatistics.
5. Clinico-Social case studies of common communicable diseases, non-communicable conditions and MCH & FP beneficiaries.

Internal Assessment:

1. 1st Internal Assessment will be held at the end of 4th term, 2nd Internal Assessment at the end of 6th term and 3rd Internal Assessment (Preliminary examination) at the end of 7th term. 3rd Internal/Preliminary examination will be similar to the pattern of University examination.

   Total Marks – 80 (Theory – 60, Practical- 20)

   Theory – 60 Marks :

   Out of 3 Internal Assessment exams conducted average of any two best Internal Assessment Marks obtained will taken into consideration for calculating internal assessment. 30 Marks are allotted for theory exams. Other 30 marks are distributed as follows:

   A) Medico Social Case Study examination will be conducted at the end of Block Posting – 10 Marks.
   B) Seminars - 10 Marks
   C) Journals/Record keeping - 10 Marks

Practicals:

A minimum of 2 practical tests will be conducted one at the end of 4th term and second at the end of 7th term. Average of these 2 tests shall be reduced to 20 marks.

UNIVERSITY EXAMINATION :

* Note: The examination for Community Medicine will be held in Phase III along with Part – I subjects.

A. WRITTEN PAPER : 200 MARKS

There shall be two papers, each carrying 100 marks. Each paper shall be of 3 hours duration. The pattern of questions would be of three types:

Long essay question – each question carrying	- 10 Marks x 2 questions
Short essay question – each question carrying	- 5 Marks x 10 questions
Short answer question – each question carrying	- 3 Marks x 10 questions

Distribution of subjects in Paper I and Paper II, from the University examination is given below*

Paper I : 100 Marks

Evolution of public health and concepts of health, environment and health, health education, nutrition and dietetics, occupational health, medical sociology and community mental health, bio-statistics, basic epidemiology.

Paper II : 100 marks

Epidemiology of specific diseases : Communicable & Non-communicable diseases, demography, reproductive and child health, school health, geriatrics, urban health, health system in India, health planning & management including disaster management, international health.

*The topics assigned to the different papers are generally evaluated under those sections. However a strict division of the subject may not be possible and some overlapping of topics is inevitable, students should be prepared to answer overlapping topics.

B. PRACTICAL : 80 MARKS

The distribution of different components shall be :

- Problem solving exercises - 35 marks
  (Problems based on Epidemiology, Biostatistics, Demography, Environmental health, Nutrition and Health care of Community).
- Clinico-Social case presentation - 35 marks
- Spotters - 10 marks

C. VIVA VOCE : 40 MARKS
Consist of questions on all aspect of syllabus.

List of text books and reference books :-

1.K. Park, text book of Preventive and Social Medicine, 21st Edition.

2.A. H. Suryakanta, text book of Preventive and Social Medicine with recent advances, 3rd Edition.

3.B.K. Mahajan, text book of Biostatistics, 6th Edition.

4.J. Kishore, text book for National Health Programme of India, 8th Edition.

5.Sunderlal, text book of Preventive and Social Medicine, 3rd Edition.

PHASE III, PART II

PAEDIATRICS INCLUDING NEONATOLOGY

a) **Goals**

The course facilitates systematic learning of common pediatric diseases, evaluation of growth and development, nutrition, immunization, social and preventive pediatrics, and counseling.

b) **Objectives**

Knowledge

- At the end of the course students will acquire the Knowledge of normal growth and development during foetal, neonatal, childhood and adolescence periods.
- Knowledge of common pediatric disorders including adolescence and emergencies, in terms of epidemiology, etiopathogenesis, clinical manifestations, diagnosis, rational therapy, rehabilitation, and prevention.
- Knowledge of age related requirements of calories, nutrients, fluids, drugs etc., in health and disease.
- Knowledge of preventive strategies for common infectious disorders, poisoning, accidents, and child abuse.
- Knowledge of national programmes related to child health, including immunization programmes.
- Knowledge of common pediatric procedures.
- Knowledge of management of the common pediatric disorders as per IMNCI, (Government of India or World Health Organization recommendations in force from time to time.)

Skills

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

- Take a detailed pediatric history, conduct an appropriate physical examination of children including neonates, make clinical diagnosis, conduct common bedside investigations, interpret common laboratory investigation results, and institute therapy.
- Know the skills of basic life support and cardio pulmonary resuscitation.
- Distinguish between normal newborn babies and those requiring special care and institute essential newborn care.
- Take anthropometric measurements, prepare oral rehydration solution, perform tuberculin test, administer vaccines available under current national programs, perform intraosseus access, start an intravenous line, provide naso-gastric feeding, and insert foleys catheter.

1. Would have observed procedures such as lumbar puncture, liver and kidney biopsy, bone marrow aspiration, pleural tap including intercostal drainage insertion, ascitic fluid tapping, venesection, and neonatal & pediatric advanced life support.

2. Provide appropriate guidance and counseling in breast feeding and complimentary feeding.

3. Provide ambulatory care to all sick children, identify indications for specialized/inpatient care and ensure timely referral of those who require hospitalization.

4. Be aware and analyze ethical problems that arise during practice and deal with them in an acceptable manner following the code of ethics.

Integration

The training in pediatrics should prepare the student to deliver preventive, promotive, curative and rehabilitative services for care of children both in the community and hospital as part of a team in an integrated form with other disciplines, e.g. Anatomy, Physiology, Biochemistry, Pharmacology, Forensic Medicine, Pathology, Microbiology, Community Medicine, Obstetrics, Medicine, and Physical Medicine and Rehabilitation.

c) Course contents
Course Contents

Knowledge Must Know	**Knowledge Desirable to Know**
The Field of Paediatrics	
1. History of Paediatrics	1. Traditions and Cultural Issues pertaining to child care
2. Overview of Child Health	2. Ethical Issues in Paediatrics
3. The normal child	
4. Preventive and Social Paediatrics	
5. Epidemiology, Basic Statistics	
Growth and Development	
1. Biopsychological Models of Development	1. IQ assessment
2. Fetal growth and development	2. Approach/management of obesity
3. The newborn G/D	
4. Infant, Preschool, Early school, Adolescence G/D/	
5. Assessment of Growth	
6. Development Assessment	
7. Standards/Normograms (including Indian)	
8. Approach to short stature	
9. Approach/management of Undernutrition	

Knowledge Must Know	**Knowledge Desirable to Know**
Psychological Disorders	
1. Assessment and Interviewing	1. Autism
2. Vegetative Disorders-Rumination, Pica, Enuresis, Encopresis, Sleep	2. Learning Disorders
3. Habit Disorders	
Social Issues	
1. Separation, death	1. Adoption
2. Abuse and Neglect	
3. Child Labor	
4. Media (TV, Movies) and its effect on the child	
Children with Special Needs	
1. Failure to Thrive – Problems, Approach and Management	1. Children in Poverty
2. Development disabilities, Chronic Illness	
3. Mental Retardation – Problems, Approach and management.	
4. Care of Child with fatal illness	

Nutrition

1. Nutritional Requirements – Water, energy, proteins, CHO, Fats, Minerals, Vitamins,
2. Diet/Nutrition Evaluation
3. Breast Milk Feeding, Human Lactation Management, BFHI
4. Infant and Child Feeding
5. Feeding through 1 and 2nd years
6. Protein Energy Malnutrition
7. Vitamin Deficiencies and Excess

1. Nutrition in Special situations – LBW, IEM, Chronic illness, Surgery, Critically ill child
2. Nutrition Values of Indian Foods, Recipes

Knowledge Must Know	**Knowledge Desirable to Know**
Patho-physiology of Body Fluids and Fluid therapy (Approach and Management) 1. Physiology of Fluids, Electrolytes and Acid Bases 2. Dehydration and fluid management 3. Approach and Management of dyselectrolytemia and Acid-base abnormalities	
Acutely Ill child (Approach and Management) 1. Evaluation in Emergency 2. Injury Control 3. Emergency Medical Services 4. Paediatric Critical Care 5. Recognition of a) Respiratory Failure b) Circulatory Failure and Shock c) Acute Neurological Dysfunction 6. Resuscitation – Basic	1. Concepts of Ventilation 2. Level II equipment for Intensive care 3. Transportation of Sick Child/neonate
Emergencies/Critical Care **Paediatrics**(Approach and Management) 1. Congestive Cardiac failure 2. Cardiogenic shock 3. Cyanotic spells 4. Vomiting and Diarrhea 5. GI Bleeds – Hematemesis, Melena, Hematochezia 6. Animal Bites 7. severe complicated malaria 8. Acute severe asthma, Bronchiolitis 9. Status epilepticus 10. Febrile seizure	1. Septicemic shock, Viral infections and shock 2. Penumothorax, empyema, pleural effusion, ascites 3. Burns/electrocution 4. Coma, Increased intra-cranial pressure

11. Cardiopulmonary resuscitation
12. Poisoning
13. Snake bite
14. Scorpion sting

Human Genetics

1. Inheritance Patterns
2. Chromosomal/genetic clinical Abnormalities
3. Genetic Counseling

1. Dysmorphism

Metabolic Disorders (Approach and Management)

1. Approach to IEM
2. Mucopolysaccharidosis
3. Hypoglycemia

Knowledge Must Know	**Knowledge Desirable to Know**
Fetus and New born (Approach and Management)	
1. Mortality and morbidity	1. Organization and levels of newborn care
1. Newborn – history, examination, routine delivery care,	2. Antenatal Diagnosis/treatment
3. High risk pregnancies	3. Congenital amomalies/malformations- Recognition and Referral
5. Fetus Fetal distress Maternal diseases Maternal medications	4.Ambiguous genitalia – Recognition and Referral
6. High risk infant Multiple pregancies Prematurity Postdated IUGR/LBW	5. Surgical problems-Recognition and referral
7. Birth injuries	6. Thermoregulation
8. Hypoxia – ischemia, asphyxia	7. Genitourinary disturbances
9. Normal Newborn	8. Neonatal transport
10. Common problems in a normal newborn	
11. Delivery room emergencies	
12. Respiratory disorders	
13. Oxygen therapy, toxicity	
16. Cardiac problems	
17. Blood disorders-- Anemia Hemorrhagic disease of newborn Hemolytic disease of newborn	
18. Metabolic disorders	
19. Nutrition and feeding the newborn-	

term/preterm, LBW, IUGR
20.Neonatal sepsis/meningitis

Knowledge Must Know	Knowledge Desirable to Know
Adolescent Health	
1. Epidemiology 2. Sexual development and SMR stages 3 . Menstrual problems – Recognition and Referral	1. Pregnancy 2. Contraception 3. STD
Immunological system	
1. Basics of Immunology 2. Approach to immunodeficiency 3. HIV	1. Bone marrow transplantation
Allergic disorders	
1. Allergy and Immunological basis 2. Allergic Rhinitis 3. Asthma 4. Atopic dermatitis 5. Urticaria, Angioedema 6. Anaphylaxis	1. Insect allergy 2. Ocular allergy 3. Adverse food reaction
Rheumatology (Approach and Management) 1. Autoimmunity 2. JRA	1. SLE

Knowledge Must Know	Knowledge Desirable to Know
Infectious diseases (Approach and Management) 1. Fever 2. Clinical use of Micro Lab 3. Fever without a focus 4. Sepsis and Shock 5. CNS Infections 6. Pneumonia 7. Gastroenteritis 8. Bacterial Infections 9. Anaerobic infections 10. Viral Infections 11. Parasitic infections Helminthiasis 12. Protozoal a. Malaria b. Giardia c. Amoeba	1. Osteomyelitis, Septic arthritis 2.Preventive measures a. Health advice for traveling. B.Infection control

13. Antimicrobials , Antiparasitic drugs, Antivirals drugs
14. Emerging and re-emerging diseases of tropics like dengue, chikungunya , H1N1 flu

Immunization

1. Principles, Schedules of Standard vaccines 2. Adverse events following vaccines	1. Optional Vaccines

Knowledge Must Know	**Knowledge Desirable to Know**
Digestive system (Approach and Management) 1. Normal tract – Physiology, Anatomy, Development 2. Clinical features of Disorders 3. Acid Peptic disease, GI bleeds 4. Malabsorption, Obstruction 5. Disorders of Liver and biliary system Acute Hepatitis, Chronic Hepatitis, Cirrhosis,	Peritonitis
Respiratory system (Approach and Management) 1. Development and Physiological function 2. Upper Respiratory tract infection 3. Lower Respiratory tract infection 4. Pleural disorders Empyema, Effusion 5. Bronchial Asthma	1. Pulmonary Function tests 2. Basics/Indications of Ventilation
Cardiovascular System (Approach and Management) 1. Investigations – Lab, ECG, CXR, 2. Congenital Heart Disease Approach --- Cyanotic Acyanotic 3. Acquired heart disease a. Rheumatic Heart Disease b. Infective endocarditis 4. Cardiac Therapeutics	1. Physiology and Pathophysiology of Transitional Circulation 2. ECHO 3. Cardiac Arrhythmia
Knowledge Must Know	**Knowledge Desirable to Know**
Blood (Approach and Management) 1. Anemia Inadequate production Nutrition – Iron, Folate, B12 Bone Marrow failure	1. Development of Hematopoietic system

Hemolytic
Congenital and Acquired
2. Pancytopenia
3. Hemorrhagic disorders –
acquired and congenital
Bleeding disorders
Coagulation disorders
4. Physiology and Disorders of the Spleen
5. Blood and component transfusions

Neoplasms (Approach and Management)

1. Principles of diagnosis
2. Principles of treatment
3. Leukemia
4. Lymphomas

1. Neuroblastomas
2. Retinoblastoma

Nephrology (Approach and Management)

1. Hematuria and conditions
2. Proteinuria
3. Nephrotic syndrome
4. Acute Glomerulonephritis

1. Tubular disorders
2. Renal Failure & Renal Replacement therapy

Knowledge Must Know

Knowledge Desirable to Know

Urological disorders
(Approach and Management

1. UTI
2. Vesicoureteral reflux
3. Obstructions
4. Investigations – imaging, renal function tests

1. Penis, urethra anomalies
2. Urinary lithiasis
3. Scrotal anomalies

Gynecological problems
(Approach and Management)

1. Menstruation – Normal
2. Vulvovaginitis

Endocrine (Approach and Management

1. Thyroid
Thyroid studies
Hypothyroidism
Hyperthyroidism
Goitre
3. Diabetes mellitus
3. Approach to short stature

1. Hypothalamus and pituitary
Hyperpitutarism
Hypopitutarism,
Growth hormone
DI
ADH
2. Adrenal Disorders
CAH
Cushing
Addisons
3. Parathyroid and disorders

Knowledge Must Know	Knowledge Desirable to Know
CNS (Approach and Management)	
1. Examination, Localization of lesions	1. Acute Flaccid paralysis
2. Seizures & Febrile seizure	
3. Antiepileptic drugs	
4. Headaches	
5. Coma	
6. Hydrocephalous	
7. Pyogenic Meningitis	
8. Viral meningoencephalitis	
9. TB meningitis	
10. Cerebral Palsy	
Neuromuscular	
(Approach and Management)	
1. Evaluation, investigations	1. GB syndrome
2. Muscular Dystrophy	
3. Floppy Infant	
4. Bell's Palsy	
Eye	
1. Examination of eye	1. Papilledema
2. Squint	2. Vision
5. Diseases of Conjunctiva - Conjunctivitis	3. Injuries to eye
5. Diseases of Lens – Cataracts	4. Retinopathy of Prematurity
6. Vitamin A deficiency	5.Diseases of Optic nerve – Papillitis, Neuritis
8. Lacrimal problems – Dacrocystitis	

Knowledge Must Know	Knowledge Desirable to Know
Skin	
1. Eczema	1. Leprosy
2. Cutaneous Infections – Bacterial, Viral, Fungal	
3. Arthropod bites, infestations	
4. Atopic dermatitis	
5. Nutritional diseases	
Bone/Joint	
1. Congenital Dislocation of Hip	1. Achondroplasia
2. Osteomyelitis	2. Osteopetrosis
3. Septic Arthritis	
4. Rickets – Nutritional and non nutritional	
5. Bone and vitamin D	
Unclassified disease	
1. SIDS	
Environmental	
1. Lead poisoning	
2. Envenomation	
3. Mammalian bites	

4. Common Poisonings – OP, Kerosene, Phenobarbitone, Iron, etc

VI TERM 16 CLASSES

VITAL STATASTICS

1. Introduction to age related disorders, IMR, PMR, EPMR, Child Mortality and Morbidity
2. Preventive pediatrics
   Different national programmes – ICDS, MCH, RCH, CSSM, IMCI, RCH and other preventive programmes.

BEHAVIOURAL PROBLEMS

3. Pica, Enuresis, Breath holding spells. Temper tantrums, Encopressis Thumb sucking, Tics.

GROWTH AND DEVELOPMENT

4. Growth and development, parameters of growth, and growth monitoring
5. Developmental milestones and assessment of development

NUTRITION

6. Normal Nutritional requirements of different age groups.
7. Breast feeding and lactation failure management
8. Infant feeding
9. Protein Energy malnutrition Part I
10. Protein Energy malnutrition Part II
11. Vitamin disorders – Fat soluble
12. Vitamin disorders – water soluble
13. Micronutrients disorders & Mineral disorders

MISCELLANEOUS

14. JRA
15. Communication skills and counseling the parents
16. Ethical consideration in pediatric practice with case illustrations (2 cases)

VII TERM 13 Classes

INFECTIONS

1. Exanthematous illness: Measles, Rubella, Chicken pox, Mumps etc.
2. Typhoid fever
3. Tuberculosis Part – 1
4. Tuberculosis part – 2
5. Parasitic infestations

6. Malaria symposium
7. HIV infection (prenatal / perinatal / postnatal)
8. Dengue hemorrhagic fever

HEMATOLOGY

9. Leukemia, Lympho reticular malignancy
10. Nutritional anemia
11. Hemolytic anemia
12. Bleeding / Coagulation disorder

GENETICS

13. Genetic terminology and definitions, common genetic disorders (Down's Syndrome)

VIII TERM 20 Classes

NEONATOLOGY

1. Classification of newborn, and Gestational age assessment
2. Normal newborn, and newborn care Neonatal infection
3. High risk pregnancy and high risk neonates
4. Neonatal jaundice
5. Low birth weight babies including their feeding
6. Birth asphyxia
7. Birth Injuries
8. Respiratory distress in the newborn
9. Neonatal Seizures
10. Congenital anomalies (diaphragmatic hernia, Cleft palate, Cleft lip, Pyloric stenosis)

GASTROENTEROLOGY

11. Viral Hepatitis
12. Cirrhosis of liver
13. Acute Gastroenteritis

RESPIRATORY SYSTEM

14. Acute Upper respiratory tract infections including Croup syndrome
15. Acute LRTI (Pneumonia and Bronchiolitis)
16. Foreign body and suppurative lung diseases
17. Bronchial Asthma

CARDIOLOGY

18. Rheumatic fever & RHD
19. Cyanotic congenital heart diseases
20. Acyanotic congenital heart diseases

IX TERM 17 Classes

ENDOCRINOLOGY

1. Common endocrinal disorders – hypothyroidism
2. Juvenile diabetes
3. Short stature – evaluation

CENTRAL NERVOUS SYSTEM:

4. Cerebral palsy
5. Mental retardation other than cerebral palsy
6. Hydrocephalus
7. Seizure disorders (including febrile seizures)
8. Acute central nervous system infections – bacterial
9. Acute central nervous system infection – viral

PEDIATRIC EMERGENCIES

10. Shock in children
11. Poisoning in children – Prevention / Management
12. Snake bite and scorpion sting
13. Drowning
14. Burns

NEPHROLOGY

15. Nephritis
16. Nephrotic syndrome
17. Urinary tract infection

The topics for integrated teaching involving other faculties (Two hours each)

1. Bleeding and coagulation disorders
2. Coma
3. PUO
4. Jaundice
5. Anemia
6. High risk pregnancy and the neonate (with Obstetrics and Gynecology)
7. Renal failure
8. Rheumatic Heart Disease
9. Portal hypertension
10. Tuberculosis
11. Malaria
12. Fetal and postnatal development (with Obstetrics and Gynecology)
13. Cerebral palsy

DEMONSTRATION:

IX TERM

1. Nutritional exhibition
2. Immunization : Administration of vaccines, vaccine preventable diseases, National immunization programme, individual vaccines, Newer vaccines, Pulse polio, Cold chain
3. Gastroenteritis - Diarrhea Treatment Unit (DTU)
4. Bronchial asthma including management of status asthmatics
5. Resuscitation of newborn
6. Developmental assessment
7. Pediatric procedures

Note: The number of classes mentioned are suggestive

d) Teaching hours

Theory: Total number of theory hours will be 100 hrs

d) Clinical postings: Total number of weeks of clinical postings – 10 weeks

6^{th} / 7^{th} term – 4 weeks

1. Introduction to Pediatrics
2. Pediatric History taking
3. Pediatric physical examination including neurological assessment
4. Common conditions like PEM, Acute gastroenteritis, and ARI.

8^{th} / 9^{th} Term – 6 weeks
An additional emphasis will be placed on Diagnosis and Management of individual cases.

Some suggested cases are:
Assessment of growth and development in a normal child
Gastroentertis with dehydration
Kwashiorkar , Marasmus
Down's Syndrome

Central Nervous System
Meningitis / meningitic sequelae
Cerebral palsy
Hemiplegia/ Monoplegia/ Isolated cranial nerve palsy
AFP, Rheumatic chorea

Cardio Vascular System
Rheumatic heart disease – M.S, M.R, Carditis
Congenital heart disease – VSD, PDA, TOF
Infective endocarditis

Respiratory System
Pneumonia
Empyema
Suppurative lung disease

Gastrointestinal System
Hepatosplenomegaly, Ascites, Hepatitis, Portal hypertension

Renal system
Nephrotic syndrome
Nephritis

Neonatology
Brief History
Examination of newborn, including common problems
Gestational age assessment including classification

Endocrine
Cretinism

During 2nd Clinical posting each student should write 10 case sheets in the students Journal

e) Scheme of Examination

INTERNAL ASSESSMENT: Total Marks 50 (Theory 30, and clinical 20)
Theory 30 Marks
Minimum of three examinations are recommended. Theory test will be of short answer type. The 9th term examination preceding the University examination may be similar to the pattern of University examination. Average of any two best marks obtained in the notified internal examination will be taken into consideration for calculating internal assessment. The total marks be reduced to 30 and sent to the University
Clinical 20 Marks
The clinical internal assessment will be conducted at the end of each posting-- that is 2 clinical internal assessment examinations. OSCE will be the method of assessment in the first internal assessment exam. The marks obtained in the clinical examination shall be reduced to 20 marks and sent to the University.

The internal assessment marks both theory and practical obtained by the candidates should be sent to the University at least fifteen days prior to the commencement of theory examination. Note that a student shall secure at least 50% of the total marks fixed for internal assessment in a particular subject in order to be eligible to appear in final university examination.

UniversityExamination
Theory (Written Paper)

There shall be one paper of 3 hours duration, carrying 100 marks.

The pattern of questions would be of three types:

Long essay question - each question carrying 10 marks

Short essay question -question - each question carrying 5 Marks

Short answer question - each question carrying 3 Marks

Clinical exams

Clinical--80 Marks (Two cases of 40 marks each)

Suggested cases for clinical examination:
Assessment of growth and development in a normal child
Gastroentertis with dehydration
Kwashiorkar , Marasmus
Meningitis / meningitic sequelae
Cerebral palsy
Hemiplegia/ Monoplegia/ Isolated cranial nerve palsy
Rheumatic heart disease – M.S, M.R, Carditis
Congenital heart disease – VSD, PDA, TOF
Pneumonia
Empyema
Suppurative lung disease
Hepatosplenomegaly
Cretinism
Normal newborn
Down's Syndrome

Viva voce-- 20 marks includes questions on

1. Nutrition
2. X-Rays
3. Drugs and vaccines
4. Instruments

Text Books-- Recommended

1. Indian Academy of Pediatrics (IAP) - Textbook of Pediatrics.
2. Ghai O P, Essential pediatrics CBS Publishers
3. Achar Text book of pediatrics Orient Longman
4. Meharban Singh's Clinical Methods, Sagar Publication
5. Hutchison's Clinical Methods Swash publication
6. Meharban singh, Care of the Newborn, Sagar Publications

Books-- Selected Reading

Nelson Textbook of Pediatrics Saunders Publications.

Note : Student must refer to the most recent edition of the recommended books .

MEDICINE & ITS ALLIED SPECIALITIES

Medicine and its allied specialties:

a) Medicine
b) Psychiatry
c) Dermatology
d) Tuberculosis & Respiratory Diseases

COURSE CONTENTS:

A) MEDICINE

a) Goal

The broad goal of teaching of undergraduate students in Medicine is to have the knowledge, skills and behavioral attitudes to function effectively as the first contact physician.

b) Objectives

Knowledge

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

1. Diagnose common clinical disorders with special reference to infectious diseases, nutritional disorders, tropical and environmental diseases.
2. Outline various modes of management including drug therapeutics especially dosage, side effects, toxicity, interactions, indications and contra-indications.
3. Perform diagnostic and investigative procedures and interpret them.
4. Provide first level management of acute emergencies promptly and efficiently and decide the timing and level of referral, if required.
5. Recognize geriatric disorders and their management.

Skills

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

1. Develop clinical skills (history taking, clinical examination)to diagnose various common medical disorders and emergencies.
2. Refer a patient to secondary and/or tertiary level of health care after having instituted primary care.
3. Perform simple routine investigations like haemogram, stool, urine, sputum and biological fluid examinations.
4. Assist the common bedside investigative procedures like pleural tap, lumbar puncture, bone marrow aspiration/biopsy and liver biopsy.

Integration

1. With Community Medicine and Physical Medicine and Rehabilitation to have the knowledge and be able to manage important current national health programmes, also to be able to view the patient in his/her total physical, social and economic milieu.
2. With other relevant academic inputs which provide scientific basis of clinical medicine e.g., anatomy, physiology, biochemistry, microbiology, pathology and pharmacology.

Departmental Objectives

- At the end of clinical postings in General Medicine, the medical student will;
- Be able to evaluate each patient as a person in society and not merely as a collection of organ systems.
- Have developed an interest in and care for all types of patients.
- Be able to discern the hopes and fears of patients, which inevitably underlie the symptom complexes and know how to handle these emotions, both in himself and in others.
- Possess adequate knowledge in the sciences of Medicines and be able to
- Elicit a good clinical history and physical findings, elucidate the clinical problems based on these and discuss the means of solving the problems common side lab procedures.
- Outline the principles of management of various diseases.
- Have an open attitude to the developments in medicine so as to be aware of the need to keep abreast of new knowledge.
- Learn to be adaptable to new ideas and new situations where resources may be limited.
- Possess knowledge of and perform certain procedures.
- Understand the ethical and legal implications of his medical decisions.

c) Course Contents

Knowledge

I. Clinical methods in the practice of medicine:

1. Clinical approach to the patient: The art of medicine, doctor Patient relationship, communication skill and doctor's responsibilities.

2. Clinical approach to disease and care of patient; Diagnostic possibilities based on interpretation of history, physical findings and laboratory investigations and principles of rational management.

II. Common symptoms of disease:

1. Pain: Pathophysiology, clinical types, assessment and Management
2. Fever: Pathophysiology of heat regulation, its disturbances, clinical types, clinical assessment and management.
3. Cough expectoration and hemoptysis.

4. Dyspnoea, tachypnea, and cyanosis.
5. Common urinary symptoms including dysuria, oliguria, nocturia, polyuria, incontinence and enuresis.
6. Edema and Anasarca.
7. Shock and cardiovascular collapse.
8. Cardiac murmurs: functional and organic.
9. Anorexia, nausea and vomiting.
10. Constipation and diarrhoea.
11. Hematemesis, melena and hematochezia.
12. Jaundice and hepatomegaly
13. Abdominal swelling and ascities.
14. Weight loss and weight gain.
15. Fainting, syncope and seizures, headache, dizziness and vertigo
16. Paralysis, movement disorders and disorders of gait.
17. Coma and other disturbances of consciousness.
18. Pallor and bleeding.
19. Enlargement of lymphnodes and spleen.
20. Joint pain and pain in the extremities and back.

III. Nutrition/exposure to physical and Chemical agents:

1. Nutrition and dietary management:
   i) Nutritional requirements
   ii)Protein calorie malnutrition in adults.
   iii)Obesity
   iv)Vitamin deficiency and excess.
2. Fluid and electrolyte balance; acidosis and alkalosis in particular relevance to vomiting, diarrhoea, uremia and diabetic ketoacidosis.
3. Poisoning: Phenobarbitone, Organophoshorous compounds, sedative/hypnotic, and other common poisons in the locality.
4. Acute and chronic effects of alcohol and their management.
5. Venoms, stings, insect bites: poisonous snakes, insects and scorpions.
6. Disturbances of temperature: heat stroke, heat exhaustion and cold exposure.
7. Drowning, electrocution and radiation hazards.

IV. Infections:

- Approach to infectious diseases, diagnostic and therapeutic principles.
- General principles of rational use of antibiotics and other chemotherapy against the following:
- Common gram positive infections
- Common gram negative infections
- Enteric fever
- Cholera, gastroenteritis food poisoning and
- Dysentery.
- Influenza and other common viral respiratory

- infections
- Rabies
- Tetanus
- Herpes simplex and herpes zoster
- Amoebiasis and worm infestations
- Malaria, filariasis, leishmaniasis
- Common exanthemata
- HIV infections and infections in the
- Common sexually transmitted diseases.
- Common fungal infections.
- Viral encephalitis.
- Tuberculosis.
- Leprosy.
- Infectious mononucleosis.
- Brucellosis.

V HAEMATOLOGY:

Definition, prevalence, etiological factor, pathophysiology, Pathology, recognition, investigations and principles of, Treatment of:
Anaemia: iron deficiency, megaloblastic and common
Hemolytic anaemia (thalassemia, sickle cell and acquired hemolytic)
Common bleeding disorders (thrombocytopenia and hemophilia).
Agranulocytosis, aplastic anaemia and leukemia.

Lymphomas
Blood group and transfusion: Major blood group systems and histocompatibility complex, concepts of transfusion and component therapy; indications for transfusion therapy, precautions to be taken during blood transfusion, hazards of transfusion and safe handling of blood and blood products.

VI. RESPIRATORY SYSTEM:

1	Physiology and diagnostic methods: Sputum examination, X-ray chest, pulmonary function tests and bronchoscopy.
2	Upper respiratory infections
3	Pneumonias.
4	Bronchiectasis and lung abscess.
5	Bronchial asthma and tropical eosinophilia.
6	Chronic obstructive airway disease and corpulmonale.
7	Acute and chronic respiratory failure.
8	Disease of pleural effusion, empyema, pneumothorax.
9	Pulmonary tuberculosis.
10	Neoplasms of lung
11	Common occupational lung diseases.

VII. CARDIO VASCULAR SYSTEM:

1. ECG, X-ray chest with reference to common cardiovascular diseases.
2. Coronary artery disease.
3. Rheumatic fever and rheumatic heart disease
4. Infective endocarditis
5. Hypertension and hypertensive heart disease.
6. Acute and chronic heart failure.
7. Common congenital heart disease in adolescents and adults : ASD,VSD,PDA,TOF and Coarctation of aorta.
8. Common cardiac arrythmias.
9. Acute and chronic pericarditis, pericardial effusion and cardiac tamponade.
10. Common aortic diseases, peripheral vascular disease, arterial and venous.

VIII. GASTRO-INTESTINAL TRACT:

1 Stool examination, endoscopy in reference to common Gastrointestinal diseases.
2. Acid peptic disease.
3. Malabsorption syndrome.
4. Inflammatory bowel disease and irritable bowel syndrome.
5. Acute and chronic hepatitis.
6. Cirrhosis of liver.
7. Abdominal tuberculosis.

IX. EMERGENCY MEDICINE:

1. Cardiopulmonary resuscitation
2. Acute pulmonary oedema.
3. Hypertension emergencies.
4. Diabetic keto acidosis and hypoglycemia.
5. Status epilepticus.
6. Acute severe bronchial asthma.
7. Shock and anaphylaxis.
8. Acute myocardial infarction.
9. Upper GI bleeding and hepatic coma.
10. Diagnosis and management of comatose patient.
11. Management of unknown poisoning.

X. NEUROLOGICAL SYSTEM:

1 Cerebrovascular diseases.
2 Meningitis: Viral, bacterial and tuberculous.
3 Peripheral neuropathy
4 Epilepsy
5 Extra pyramidal diseases.
6 Common compressive and non-compressive spinal cord syndromes.
7 Motor system disease, motor neuron disease.
8 Myasthenia gravis.
9 Common myopathies in India.
10 Degenerative, nutritional and metabolic diseases of the nervous system.

XI. NEPHROLOGY AND URINARY SYSTEM:

1. Acute renal failure.
2. Chronic renal failure
3. Nephritis and nephrotic syndrome.
4. Urinary tract infections/pyelonephritis.
5. Tubulointerstitial diseases and toxic neuropathies.

XII. CONNECTIVE TISSUE DISORDERS:

1. Rheumatoid arthritis.
2. Degenerative joint disease including cervical spondylosis.
3. Systemic lupus erythematous, systemic sclerosis and other collagen vascular diseases.
4. Gout

XIII. ENDOCRINES:

1. Diabetes mellitus.
2. Hypo and hyperthyroidism, Iodine deficiency disorders.
3. Cushing's syndrome and Addison's disease.
4. Pituitary disorders: Acromegaly and Sheehan's syndrome.
5. Calcium and phosphorus metabolism: parathyroid and Metabolic bone disease.

XIV. GERIATRICS:

1. Geriatric medicine: general principles of dealings with Health problems of the elderly.

XV. BIO-MEDICAL WASTE:

Types, potential risks and their safe management (see Annexure 3)

Skills

1. Obtain a proper relevant history, and perform a humane and through clinical examination including internal examinations (per-rectal and per-vaginal) and examinations of all organs/systems.
2. Arrive at a logical working diagnosis after clinical examination.
3. Order appropriate investigations keeping in mind their relevance (need based) and cost effectiveness.
4. Plan and institute a line of treatment which is need based, cost effective and appropriate for common ailments taking into consideration:
5. Recognise situations, which call for urgent or early treatment at secondary and tertiary centres and make a prompt referral of such patients after giving first and or emergency treatment.
6. Assessment and manage fluid/electrolyte and acid-base imbalance.
7. Interpret abnormal biochemical laboratory values of common diseases.
8. Interpret skiagrams of common diseases.
9. Identify irrational prescriptions and explain their irrationality.

10. Interpret serological tests such as VDRL, ASLO, Widal, HIV, Rheumatoid factor, Hepatitis and TORCH infections.
11. Demonstrate empathy and humane approach towards patients, relatives and attendants.
12. Demonstrate interpersonal and communication skills befitting a physician in order to discuss the illness and its outcome with patient and family.
13. Develop a proper attitude towards patients, colleagues and other staff.
14. Maintain an ethical behavior in all aspects of medical practice.
15. Develop a holistic attitude towards medicine taking social and cultural factors in each case.
16. Obtain informed consent for any examination/procedure.
17. Appreciate patients right to privacy.
18. Write a complete case record with all necessary details.
19. Write a proper discharge summary with all relevant information.
20. Write a proper referral note to secondary or tertiary centres or to other physicians with all necessary details.
21. Assess the need for issue proper medical certificates to patients for various purposes.
22. Adopt universal precautions for self protection against HIV and hepatitis and counsel patients.
23. Perform skin sensitivity tests for drugs and serum.
24. Record and interpret ECG and be able to identify common abnormalities like myocardial infarction and arrhythmias.
25. Start intravenous line and infusion.
26. Do venous cut down.
27. Give intra dermal, subcutaneous, intra muscular, intra venous injections.

d) Teaching Hours

Teaching of Medicine and its allied specialties starts from 3rd term and extends to 9th term during phase II and III. Theory is taught for 300 hours starting from 4th term till 9th term as follows:

Integrated Teaching: 36 hours for group discussions, seminars etc., involving multi-speciality teachers.

Clinical Posting:26 weeks (see table)

Phase	Term	No. of classes Per week	Total Hours
Phase II	4th Term	1	24
Phase II	5th Term	1	24
Phase III	6th Term	1	24
Phase III	7th Term	2	48
Phase III	8th Term	3	72
Phase III	9th Term	3	72
Total			264

b) PSYCHIATRY

Course Description

As specified by Medical Council of India

a) Goal

The aim of teaching the undergraduate student in Psychiatry is to impart such knowledge and skills that may enable to diagnose and treat common Psychiatric disorders, handle Psychiatric emergencies and to refer complicated/unusual manifestations and refer Psychiatric disorders to the specialist.

b) Objectives

Knowledge

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

1. Comprehend nature and development of different types of normal human behavior like learning, memory, motivation, personality and intelligence;

2. Recognize difference between normal and abnormal behavior,

3. Classify psychiatric disorders;

4. recognize clinical manifestations of the following common syndromes and plan their appropriate management; organic psychosis, functional psychosis, schizophrenia, affective disorders, neurotic disorders, personality disorders, psycho-physiological disorders, drug and alcohol dependence, psychiatric disorders of childhood and adolescence;

5.Describe rational use of different modes of therapy in psychiatric disorders.

Skills

The student shall be able to

1. Interview the patient and understand different methods of communication in patient doctor relationship.
2. Elicit detailed psychiatric case history and conduct clinical examination for assessment of mental status;
3. Define, elicit and interpret psycho-pathological symptoms and signs;
4. Diagnose and manage common psychiatric disorders;
5. Identify and manage psychological reactions and psychiatric disorders in medical and surgical patients in clinical practice and in community setting.

Integration

Training in Psychiatry shall prepare the students to deliver preventive, promotive, curative and re-habilitative services for the case of patients both in the family and community and to refer advance cases to a specialized Psychiatry/Mental Hospital. Training should be integrated with the department of Medicine. Neuro-Anatomy, Behavioral Sciences and Forensic Medicine.

Departmental Objectives

At the end of the course, the student will be able to comprehend nature and development of different aspects of normal human behavior like learning, memory, motivation, personality and intelligence.

Recognise difference between normal and abnormal behavior.

Classify psychiatric disorders.

Recognise clinical manifestations of common syndromes, and plan their appropriate management.

Describe rational use of different modes of therapy in psychiatric disorders.

C) Course Contents

1. History aspects of the diagnosis and treatment of mental illness; concept of mental health v/s illness; classification system currently in use in psychiatry.
2. Eliciting a detailed psychiatric history and conduction of a mental status examination; defining, eliciting and interpreting psycho pathological symptoms and signs.
3. Concept of underlying normal and abnormal human behavior; principles o learning, memory, personality and intelligence; psychopathology (ef.Behavioural sciences).
4. Classification of the different types of psychoses; differences between psychoses and neuroses; difference between functional and organic psychoses.
5. Clinical features, diagnosis and management of:

a) Schizophrenia. b) Mania and depression

c) Anxiety disorders and hysteria. d) Dementia.

e) Alcoholism.

6. Clinical recognition and initial therapy of psychiatric emergencies.
7. Clinical features, diagnosis and management of psychiatric disorders of childhood and adolescence.
8. Use of questionnaires in psychology.
9. Use of intelligence test.
10. Personality disorders.

Skills

Do psychiatric evaluation and recognize common psychiatric illness.

d) Teaching Hours

Theory: 20 Hours, Clinical Posting:2 weeks.

DERMATOLOGY, VENEROLOGY AND LEPROSY

Goals

The main goal of undergraduate teaching in Dermatology, Venereology and Leprosy is to train the student in such a way that he/she acquires knowledge and skills to diagnose and treat common dermatoses, and refer complications of common dermatoses or emergencies or rare diseases to a specialist.

Objectives

At the end of the course in Dermatology, Venereology and Leprosy, the student should demonstrate the following knowledge and skills:

A. Knowledge

1. Clinical manifestations and complications of common dermatological conditions and emergencies
2. Relevant investigations to confirm the diagnosis of common dermatoses
3. Pharmacology of commonly used topical preparations and systemic drugs in Dermatology, Venereology and Leprosy
4. Various therapeutic options (both medical and surgical) available for a given disease and selection of appropriate therapy after discussing the same with patients and/or their relatives
5. Recognition of need for referral in case of complications developed during the treatment of common dermatoses, or emergencies, or rare diseases

B. Skills

1. Elicitation of relevant and correct clinical history and presenting it in a chronological order
2. Complete clinical examination and demonstration of diagnostic clinical signs and/or tests that will help in arriving at the correct diagnosis of common dermatoses and emergencies
3. Simple side-lab procedures or tests required to make bedside diagnoses
4. Method of application of various topical preparations and compresses used in the treatment of common dermatoses

Syllabus

a. Theory

- <u>Topics that a student must know</u>
  1. Structure and functions of skin and its appendages
  2. Common cutaneous bacterial infections: impetigo, ecthyma, folliculitis, furuncle, carbuncle, cellulitis, erysipelas
  3. Common cutaneous fungal infections: pytiriasis versicolor, dermatophytoses, candidal infections
  4. Common cutaneous viral infections and viral examthems: varicella, herpes simplex, herpes zoster

5. Common ectoparasitic infestations and arthropod bites: scabies, pediculosis, papular urticaria
6. Contact dermatitis, atopic dermatitis, seborrheic dermatitis
7. Urticaria, angioedema, erythema multiforme, Steven-Johnson's syndrome and toxic epidermal necrolysis
8. Papulosquamous disorders: psoriasis and lichen planus
9. Nutritional dermatoses: Cutaneous manifestations of protein energy malnutrition, pellagra, riboflavin and vitamin A deficiencies
10. Pigmentary disorders: vitiligo, melasma
11. Others: acne vulgaris
12. Leprosy: microbiology, pathology, clinical features, reactions and deformities, investigations, management and control
13. Sexually transmitted diseases: cutaneous manifestations of HIV infection
14. Cutaneous manifestations of emerging diseases like chikungunya, dengue, rickettsial fevers

- Topics that are desirable to know
  1. Diseases causing acute skin failure: erythroderma, pemphigus, staphylococcal scalded skin syndrome, severe adverse cutaneous drug reactions
  2. Cutaneous manifestations of common systemic diseases: diabetes mellitus, renal failure, hepatobiliary disorders, thyroid disorders

b. Practical

- Skills that a student must perform independently

  1. Identification of primary, secondary and special skin lesions, and general principals of approach to a patient with skin diseases
  2. Clinical signs and tests: Auzpitz's sign, dermographism, Nikolsky's sign, diascopy
  3. Slide lab procedures: wet mount preparation, KOH mount, Gram staining, Tzanck smear, Z-N staining
  4. Potassium permanganate and saline compresses
  5. Leprosy: testing for anesthesia/impaired sensations in skin patches and extremities, demonstration of peripheral nerve thickening, care of deformities and trophic ulcers, prevention of disabilities through counseling, and foot and hand care
  6. Sexually transmitted diseases: syndromic management, Gram staining of genital discharge for gonococci

- Skills that a student must perform under supervision
  1. Slit skin smear for demonstration of M. leprae
  2. Incision and drainage of abscesses
  3. Management of urticaria and angioedema

- Skills that a student must learn by assisting the specialist
    1. Skin biopsy
    2. Management of dermatological emergencies

- Skills where a student participates as an observer
    1. Molluscum and wart removal techniques
    2. PUVA and NBUVB therapy
    3. Patch testing
    4. Dark ground microscopy
    5. Tissue smear
    6. Vitiligo surgeries

Teaching methods

A. Structured interactive sessions (lectures)
B. Small group discussions (demonstration and discussion of clinical cases during clinical postings)
C. Self-learning tools
    - Assignments
    - Problem based learning
    - Written case scenarios
    - Simulated patient management problems
    - One to one teaching in wards

Learning resource materials

Textbooks, internet, teaching aids: CDs, videos and slides

Assessment

Formative at the end of capsule course and clinical postings, and summative at the end of the course

A. Theory

    1. Problem solving MCQs
    2. Structured long questions
    3. Problem solving long questions
    4. Short answer questions

B. Practical

    1. Short cases
    2. Spotters

Recommended textbooks (latest editions)

1. Roxburg's common skin diseases
2. Jopling's handbook of leprosy
3. Tropical venereology by Arya and Osaba

d) TUBERCULOSIS AND RESPIRATORY DISEASES

As specified by Medical Council of India

a) Goal

The aim of teaching the undergraduate student in Tuberculosis and Chest Diseases is to impart such knowledge and skills that may enable him/her to diagnose and manage common ailments affecting the chest with the special emphasis on management and prevention of Tuberculosis and National Tuberculosis Control Programme.

b) Objectives

Knowledge

At the end of the course of Tuberculosis and Chest-diseases, the student shall be able to:

1. demonstrate knowledge of common chest diseases, their clinical manifestations, including emergent situations and of investigative procedures to confirm their diagnosis;
2. demonstrate comprehensive knowledge of various modes of therapy used in treatment of respiratory diseases;
3. describe the mode of action of commonly used drugs, their doses, side-effects/toxicity, indications and contra-indications and interactions;
4. Describe commonly used modes of management including medical and surgical procedures available for treatment of various diseases and to offer a comprehensive plan of management inclusive of National Tuberculosis Control programme.

Skills

The student shall be able to:

1. interview the patient, elicit relevant and correct information and describe the history in chronological order;
2. conduct clinical examination, elicit and interpret clinical findings and diagnose common respiratory disorders and emergencies;
3. perform simple, routine investigative and office procedures required for making the bed side diagnosis, especially sputum collection and examination for etiologic organisms especially acid fast bacilli 9AFB), interpretation of the chest x-rays and respiratory function tests;
4. interpret and manage various blood gases and pH abnormalities in various respiratory diseases;
5. manage common diseases recognizing need for referral for specialized care, in case of inappropriateness of therapeutic response;
6. Assist in the performance of common procedures, like laryngoscopic examination, pleural aspiration, respiratory physiotherapy, laryngeal intubation and pneumo-thoracic drainage aspiration.

Integration

The broad goal of effective teaching can be obtained through integration with departments of Medicine, Surgery, Microbiology, Pathology, Pharmacology and Preventive and Social Medicine.

c) Teaching Hours

Theory: 20 hours, Clinical posting: two weeks.

SCHEME OF EXAMINATION OF MEDICINE AND ITS ALLIED SPECIALITIES

Internal Assessment: Total marks: 100; (Theory 60 and Clinical 40)

Theory: 60 marks

Minimum of three examinations are recommended. The 9th term examination preceding the University examination may be similar to the pattern of University examination. Average of any two best marks obtained in the notified internal examination is taken into consideration for calculating internal assessment. The total marks be reduced to 60 and sent to the University.

Clinical: 40 marks

There will be ward leaving examination at the end of each posting. Average of any two best marks obtained in the clinical examination shall be reduced to 40 marks and sent to the University.

The internal assessment marks both theory and practical obtained by the candidates should be sent to the University at least fifteen days prior to the commencement of theory examination. Note that a student shall secure at least 35% marks of the total marks fixed for internal assessment in a particular subject in order to be eligible to appear in final university examination.

University Examination

Total marks: 400 (Theory 200, Viva-voce 40 and Clinical 160)

Theory (Written Paper)

There shall be two papers, each carrying 100 marks. Each paper shall be of 3 hours duration. The pattern of questions would be of three types:

Long essay question – each carrying 10 marks
Short essay question – each carrying 05 marks
Short answer question – each carrying 03 marks

Distribution of subjects in Paper I and Paper II, for the University examination shall be as follows:

Paper I - General Medicine

Paper II- General Medicine including Psychiatry (20 marks), Dermatology, STD, Tuberculosis and Respiratory Diseases.

(Shall contain one question on basic sciences and allied subjects)

Clinical

Clinical examination consists of one long case carrying 80 marks and two short cases of 40 marks each. Max marks – 160.

Viva voce

Consists of oral questions on all aspects of syllabus and also interpretations of X-ray, ECG, prescriptions, etc., specimens, and instruments, 40 marks.

Recommended Books (Latest editions)

1. Davidson's Principles and Practice of Medicine, , Churchill Livingston, London.
2. API Text Book of Medicine.
3. Swash M, Hutchison's Clinical Methods,.
4. Chamberlain's Symptoms and Signs in Clinical Medicine, ELBS,.

Reference Books

1. Harrison's Principles of Internal Medicine , McGraw Hill.
2. Macleod's Clinical Examination ISE 9th Ed 1995.

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SURGERY AND ITS ALLIED SPECIALITIES

(a) General Surgery
(b) Orthopedics
(c) Radiodiagnosis
(d) Radiotherapy
(e) Anaesthesia

a) GENERAL SURGERY

(Including Pediatric Surgery)

COURSE DESCRIPTION
As specified by Medical Council of India

GOAL

Graduate capable of delivering first contact surgical care.

OBJECTIVES

Knowledge.

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

1.Comprehend and describe etiopathogenesis, and management, Principles of common surgical conditions including emergencies .

2. Understand and describe indications of fluid and electrolyte therapy.
3. Describe indications of blood transfusion and manage complications.
4. Understand and describe principles of asepsis, disinfection and sterilization and take up rational drug therapy and appropriate use of antibiotics in surgical conditions.
5. Develop basic awareness and detect common malignancies in the country, with principles of management and prevention.
6. Enumerate different types of anesthetic agents, their indications, uses contraindications and side effects.

SKILLS

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

1. Examine and diagnose common surgical conditions.
2. Plan for various tests and their interpretation.
3. Diagnose and manage patients with various types of shock.
4. Resuscitate and manage air-way, a critically injured, burns and patients with cardio-respiratory failure.
5. Resuscitate and provide basic care in polytrauma patients and refer them appropriately.
6. Diagnose and initiate treatment of acute surgical emergencies and refer appropriately.

7. Provide primary care for a patient of burns.
8. Management of wounds including tetanus, gas gangrene and prophylaxis.
9 Acquire knowledge of basic principles of operative surgery, including peri-operative procedures and manage patients in post operative period.
10.Diagnose neonatal and pediatric surgical emergencies and provide sound primary care before referring the patient to secondary/tertiary Centers
12. Identify congenital anomalies and refer them for appropriate management.
13. In addition to the skills referred above in items he shall have observed/assisted/ performed the following:
   a. Incision and drainage of abscess
   b. Debridement and suturing of open wounds and management of external hemorrhage
   c. Venesection/I.V.line insertion
   d. Excision of small lumps
   e. Biopsy of surface malignancy
   f. Catheterization and Nasogastric intubation
   g. Circumcision
   h. Vasectomy
   i. Peritoneal and pleural aspirations
   j. Diagnostic Proctoscopy
   k. Hydrocele operation
   l. Endotracheal intubation
   m. Tracheostomy and cricothyroidotomy
   n. .Chest tube insertion.

AFFECTOR DOMAIN:

1] Understand and follow ethical approach in management of surgical conditions.
2] Counsel and guide the patients regarding need, options, advantages and disadvantage of common surgical procedures.
3] Develop overall humane approach in management of terminal care for needy patients.
4] Co-ordinate and organize needful services at the time of natural disasters and mass casualties.
5] Work in tandem with National and State level health care policies.
6] Understand and follow medico legal aspects in surgical care.

Integration
The undergraduate teaching in surgery shall be integrated to various stages with pre clinical, paraclinical and other clinical departments.

C) COURSE CONTENTS

II Phase – 4th Term

(Two classes per week (48 Hours per term)

Must know

1. Introduction of Surgery, Historical background and progress made.
2. Metabolic response to injury.
3. Wounds, Wound healing, wound management and scars.
4. Asepsis, antisepsis, sterilization and universal precautions.
5. Surgical infections, causes and management.
6. Prevention of surgical site infections.
7. Tetanus, gas gangrene- management & prevention
8. Chronic specific infections, Tuberculosis, Filariasis and syphilis.
9. Boils, cellulites, abscess, necrotizing fascitis and Hospital infections.
10. Acute specific and non–specific infections
11. Antibiotic therapy
12. AIDS and Hepatitis
13. Tumours, Cysts, Ulcers, Sinuses and Fistulae, and Pressure sores.
14. Haemorrhage and Shock:-
    etiology ,pathophysiology ,symptomatology & management
15. Fluid, Electrolyte and Acid Base Balance, Nutrition
    a. Introduction to Physiology of fluids and Electrolytes
    b. Dehydration and over hydration
    c. Specific electrolyte losses, clinical presentation & management of Hypokalaemia, Hyponatraemia, Hypocalcaemia, Acidosis, Alkalosis & acid Base balance
    d. Various replacement fluids in Surgery, mode of administration and complications.
    e. Blood grouping, Blood transfusion,indications and complications.
    f. Nutrition,pre-operative, post-operative & intravenous alimentation.
    g. Nutritional support to surgical patients.

    Desirable to know
    h. Electrolyte changes in specific diseases, Pyloric obstruction, Intestinal obstruction, & Renal failure.

    Must know
16. a. Basic principles in management of trauma patients
    Mechanisms and management of missile, blast and gunshot injuries
    b. Bites and stings
    c. Infections of the hand and foot
    d.Common skin and subcutaneous conditions.
    e.Skin tumours, Skin Grafting & flaps.
    f. Burns causes, prevention & management
    g. Diagnostic Imaging.
    h. Common preoperative preparation and postoperative complications
    i. Anaesthesia and pain management

Desirable to know

j. Organ transplantation: Basic Principles

k. Diseases of muscles, tendons, bursae and fascia

II Phase – 5th Term

One class per week (24 Hours per term)

Must know

1.Arterial diseases: -

a. Assessment of a case of peripheral vascular disease
b. Acute arterial occlusion, diagnosis and initial management-Thrombosis and Embolism
c. Thromboangitis Obliterans (Buerger's disease)
d. Arterio sclerosis
e. Gangrene- Types of gangrene & management.
f. Conservative management of an ischaemic limb& Amputations.
g. Diabetic foot

Desirable to know

h. Surgical management of an ischaemic limb-direct arterial surgeries.
i. Vascular injuries-basic principles and management
j. Sympathetic system: -Anatomy, Indications for sympathectomy, Cervical sympathectomy & Lumbar sympathectomy

2.Venous diseases: -must know

a. Varicose veins
b. Superficial and deep vein thrombosis- Diagnosis, principles of therapy and prevention.
c. Chronic venous ulcers.

3.Lymphatics and Lymphnodes:

a. Diagnosis and principles of management of lymphangitis and lymphedema
b. Diseases of Lymphnodes

Desirable to know

The Reticulosis & Lymphomas

III/I Phase – 6th Term

Two class per week (48 Hours per term) must know

1 Basic principles of oncology
2 Basic principles of minimal access surgery
3 Hernia: Inguinal hernia,Femoral Hernia, Umbilical Hernia Epigastric Hernia & Ventral Hernias
4 Abdominal wall – Anatomy, Incisions, Burst abdomen,
5 **FACE**: rodent ulcer& jaw swellings
7 **MOUTH**:
   a) Ranula & retention cysts
   b) Lingual and Sublingual dermoids
   c) Carcinoma cheek
8 **TONGUE**:
   a) Hyperkeratosis and leucoplakia
   b) Ulcers of tongue& precancerous lesions
   c) Carcinoma tongue.

9 **SALIVARY GLAND**

a) Inflammation
b) Salivary calculi
c) Neoplasms

10. **NECK**: Differential diagnosis of swellings of the neck & basic principles in the management of secondaries in neck

11 **BIO-MEDICAL WASTE**: Types, Potential risks and their safe Management in relation to Surgical practice.

12. Surgical ethics and informed consent
13. Declaration of death and brain death.
14. Day care surgery

Desirable to know
Diseases of Umbilicus, Desmoid tumor, Development and Congenital anomalies cleft lip and cleft palate, Fascio-Maxillary injuries, Branchial cyst and fistula, Cystic Hygroma and solitary lymphatic cyst, Thoracic outlet syndrome.

III/I Phase – 7th Term

Two classes per week (48 Hours per term)

Must know

1.**THYROID GLAND, THYROGLOSSAL TRACT & ENDOCRINES**: -

a. Development, Anatomy, Physiology and Investigations
b. Thyroglossal cyst and fistula
c. Classification and management Goiters.
d. Solitary thyroid nodule
e. Thyroiditis,Hashimoto's disease & Riedel's thyroiditis
f. Thyroid neoplasms-Clinical features, diagnosis and management of Carcinoma of the thyroid.

Desirable to know

g. Parathyroid, adrenals and thymus

2.**BREAST**: -

a. Anatomy, physiology and lymphatic drainage
b. Clinical breast examination, breast self examination, Investigation of breast lump and Screening.
c. Inflammation of the breast and Breast abscess
d. Benign breast diseases-Fibroademoma, ANDI,Cystosarcoma phyllodes, Management of nipple discharge
e. Malignant tumors of the breast- clinical features,diagnosis, staging and principles of management.

4.**CRANIO – CEREBRAL INJURIES**:-

a. Mechanism, Pathology, investigations & Management
b. Cerebral concussion, contusion and laceration
c. Extradural haematoma

d. Subdural haematoma

Desirable to know

a. Intracerebral haematoma
b. Fractures of the skull

5. **DISEASES OF THE BRAIN**:-

a. Intracranial abscess
b. Intracranial tumors
c. Hydrocephalus

6.**DISEASES OF THE NERVES**:-

a. Injuries of nerves and nerve regeneration
b. Facial nerve

Desirable to know

c. Radial,Ulnar and Median nerve, Lateral Popliteal nerves.

7.CARDIOTHORACIC SYSTEM:

a. Injuries to the thorax- Recognition and treatment of pneumothorax, haemothorax, Flail chest, stove in chest.
b. Infections: - Empyema thoracis , Suppurative conditions of the lungs and pleura.
c. Pulmonary embolism: prevention,recognition and treatment
d. Postoperative pulmonary complications.

Desirable to know

e. Neoplasms of the lung, clinical features, diagnosis and principles of management.

III Phase – 8th Term

2 classes Theory + 1Tutorial Classes per Week/integrated teaching& student seminars

96 Hours

Must know

GENITO URINARY SYSTEM:-

Symptomatology and investigations of a genito-urinary case

1. KIDNEYS AND URETER:-

a. Congenital anomalies– Polycystic kidney
b. Trauma
c. Renal failure and dialysis
d. Hydronephrosis
e. Renal and Ureteric calculi: Diagnosis and principles of management of urolithiasis
f. Pyonephrosis, perinephric abscess
g. Genitourinary Tuberculosis
h. Neoplasms: Renal tumors Clinical features and diagnosis, Principles of management

2. **URINARY BLADDER**:-

a. Congenital anomalies- Ectopia vesicae[desirable to know]
b. Trauma –injuries to urinary bladder.

c. Retention of urine and cystitis
d. Vesical calculi
e. Bladder tumours.

3. **PROSTATE**:-
a. Surgical anatomy
b. Lower Urinary tract symptoms or prostatism
c. Benign prostatic hyperplasia; diagnosis and management.

Desirable to know
d. Carcinoma prostate-Clinical features, diagnosis and Principles of management

4**. URETHRA**:-[desirable to know]
a. Principles of management of Urethral injuries
b. Stricture and its complications.

5. **PENIS, TESTIS AND SCROTUM**:

PENIS:**-must know**
a. Phimosis,Paraphimosis,meatal stenosis & hypospadias.
b. Pre-cancerous conditions of the penis,
c. Carcinoma penis: Clinical features,diagnosis & Principles of management

TESTIS:-
a. Undescended testis and testicular torsion: Diagnosis and principles of Management.
b. Varicocele
c. Hydrocele & complications.
d. Acute epididymo orchitis
e. Testicular tumours. Clinical features and diagnosis, Principles of management[desirable to know]

SCROTUM: - Fournier's gangrene,
Carcinoma-scrotum[desiable to know]

VASECTOMY:- Indications, Techniques, Complications
Recanalisationdesirable to know]

Must know

1. **Introduction to paediatric Surgery**,
2. Fluid and electrolyte management.
   Anatomy and Physiology

3. Paediatric trauma common paediatric surgical conditions
a) Inguino-scrotal disorders,
b) Anomalies of penis,
c) Umbilical hernia,
d) Congenital hypertrophic pyloric stenosis,
e) Intussusception,
f) Acute abdomen in children.
g) Acute appendicitis,

h) UTI
constipation& prolapse rectum
i) Meckels diverticulum
g) Foreign body inhaled/swallowed.

4. Congenital malformations[desirable to know]

a) Oesophagheal atresia,
b) Intestinal atresia,
c) Intestinal malrotation,
d) Ano rectal malformation,
e) Urinary tract malformation,
f) Diagphgramatic hernia
g) Gastroschisis,
h) Biliary atresia,
i) Necrotising enterocolitis.

5. Paediatric surgery oncology

a) Neuroblastoma,
b) Wilms tumor,
c) Hepatoblastoma,
d) Rhabdomyosarcoma

III Phase – 9th Term
3 Classes per week (72 Hours per term)

Must know

1**. OESOPHAGUS**: -

a. I) Investigations of Upper G.I.tract diseases
   II) Dysphagia- differential diagnosis, investigations and management
b. Achalasia Cardia
c. Reflux Oesophagitis and hiatus hernia

d.carcinoma oesophagus : Clinical features, diagnosis and Principles of management.

2. **STOMACH AND DUODENUM:**

a. Congenital hypertrophic pyloric stenosis
b. Acute dilatation of the stomach
c. Gastritis types and clinical features.
d. Peptic ulcer: etiopathogenesis, diagnosis, management and Complications of peptic ulcer.
e. Cancer stomach, Clinical features and diagnosis, Principles of management
f. Miscellaneous-Bezoars.[desirable to know]

3. **SPLEEN**:

a. Splenic Injuries: Assessment, diagnosis and initial management of abdominal injuries.
b. Indications & complications of splenectomy

4**. LIVER**: **-**

a. Anatomy and segments of liver.
b. Hepatocellular dysfunction, failure & investigations.

c. Trauma
d. Amoebic liver abscess and pyogenic liver abscess.
e. Cysts of the liver, Simple and Hydatid cyst
f. Portal hypertension Clinical features and diagnosis, Principles of management
g. Neoplasms of the liver: primary and secondary.[desirable to know]

5.**GALL BLADDER AND BILE DUCTS**

a. Anatomy, Physiology and Investigations
b. Choledochal cyst
c. Extrahepatic biliary system, trauma & management[desirable to know].
d. Cholangitis & stricture
e. cholelithiasis and cholecystitis
f. Obstructive Jaundice
g. Carcinoma gall bladder Clinical features and diagnosis, Principles of management.[desirable to know]

6.**PANCREAS:**

a. Anatomy & Physiology
b. Trauma
c. Acute pancreatitis
d. Chronic pancreatitis
e. Pancreatic cysts-pseudocyst.
f. Carcinoma pancreas.[desirable to know]

7.**PERITONEUM:**

a. Peritonitis: causes, recognition, diagnosis, complications and principles of management
b. Subphrenic abscess
c. Abdominal Tuberculosis
d. Mesenteric cysts[desirable to know]

8.**INTESTINES:**

a. Congenital anomalies
b. Surgical aspects of intestinal amoebiasis
c. *Crohn's disease*
d. Ulcerative colitis
e. Round worm infestations and their clinical presentation
f. Carcinoma colon: Premalignant conditions of large bowel, Clinical features and diagnosis, Principles of management
g. Ileostomy & Colostomy

9. **INTESTINAL OBSTRUCTION**:

a.classification
b.Pathology
c.Signs and symptoms
d.Management

10. **SPECIFIC OBSTRUCTIONS**:

a. Intussusception
b. Volvulus of sigmoid and small bowel
c. Paralytic ileus.

11. **APPENDIX:**

a. Appendicitis: Diagnosis and management of acute appendicitis
b. Complications and Management

c. Other diseases of appendix[desirable to know]

12. RECTUM AND ANAL CANAL:

a. Anatomy, Anorectal anomalies
b. Clinical features of anorectal diseases & investigations.
c. Ano-rectal abscess & fistula in ano.
d. Fissures and Haemorrhoids.
e. Prolapse of rectum
f. Pilonidal sinus
g. Rectal polyps[Desirable to know]
h. Ano-Rectal Carcinoma

Tutorial Topics for III Phase – 8th Term
1 Class per week (48 Hours per term)

1. Ulcers in oral cavity
2. Thyroid swelling
3. Breast lumps
4. Shock & Haemorrhage
5. Abdominal Tuberculosis
6. Right iliac fossa mass
7. Thyrotoxicosis
8. Inguino-scrotal swelling
9. Scrotal swelling
10. Gastric outlet obstruction & Carcinoma Stomach
11. Upper gastrointestinal bleeding
12. Lower gastrointestinal bleeding
13. Portal Hypertension
14. Acute intestinal obstruction
15. Obstructive jaundice
16. Acute retention of Urine & Haematuria
17. Renal mass
18. Peripheral vascular diseases
19. Varicose veins
20. Lymphadenopathy

D) TEACHING LEARNING METHODOLOGY

1} Clinical Teaching – Students are posted to hospitals for clinical work every day for 3 hours. First 15 days/2 weeks are scheduled for teaching basics.

Later they are allotted units and rotated. Ward leaving clinical tests are conducted at the end of postings during 8th and 9th terms apart from preliminary exams. Best two performances are considered for calculating internal assessment in clinical. One of these ward leaving test will be in form of OSCE.

2} Lecture Classes – Total number of lecture classes will be around 350 hours[includes tutorials,integrated teaching etc].

Phase	Term	No. of classes Per week	Total Hours
Phase II	4th Term	**2**	**48**
Phase II	5th Term	**1**	**24**
Phase III	6th Term	**2**	**48**
Phase III	7th Term	**2**	**48**
Phase III	8th Term	**2 Theory + 1 Tutorials/integrated teaching[2hrs]**	**96**
Phase III	9th Term	**3**	**72**
Total		**14**	**336**

3} **Demonstration of**:

(a) X-rays and slides
(b) Pathological specimens **10 hrs**.
(c) Operative Surgery
(d) Instruments

4} **Integrated teaching along with concerned departments.[2HOURS EACH]**

1.Obstructive Jaundice, [anatomy,,pathology,radiology,G I Surgery]

2.Hyper thyroid diseases[medicine,biochemistry,]

3.Diabetes&diabetic foot,[biochemistry,microbiology,medicine & physiotherapy]

4.Critically ill patients[anaesthesia,medicine]

5.Management of polytrauma[anaesthesia,orthopaedics,radiology]

6.Cardiothoracic resuscitation[casualty,anaesthesia,cardiology]

7.Abdominal tuberculosis[OBGY,Urology]

8.Acid peptic diseases[gastro enterology,physiology psychiatry]

9.Pre malignant lesions and management of oral cavity malignancies[pathology, dentistry,community medicine]

10.HIV and surgeon[dermatology,microbiology ,ICTC]

Each of this topic will be announced earlier,a co ordinator will be chosen. The co ordinator will co ordinate with concerned departments and organize either a **student symposium**, **group discussion or panel discussion.**

Each topic will be allotted 2 hours.So total hours will be 20. These will be adjusted with theory classes.

Classes for slow learners will be conducted during 12-1pm.performance of first two tests will be the criteria to chose slow learners

Total 342+20 hrs= 362 Hrs.
Innovative teaching methods used are:
Grand rounds on post OPD days
Using videos of rare operative procedures
Student seminars
Basic skills workshop for interns at the beginning of their surgery postings.

Recommended Books;
1.Bailey & Love, A Short Practice of Surgery,.25th Edn. (International Students. Edition) 2007
2.Manipal manual of Surgery3rd edition,Dr.K.Rajgopal Shenoy&Anita Nileshwar2010,CBS Publishers.
3.Das S, Clinical Methods in Surgery 6th Edn. S.Das 13 Old mayors, Calcutta: 1999.
4.Pye's Surgical Handicraft,22nd edition,J Kyle,JAR Smith&D Johnson

Reference Books:

1.Mastery of Surgery by Robert J Baker & Joseph Fischer, vol I&II,6th edition
2.Sabiston's Text Book of Surgery,18TH edition
3.Farquharson's text book of operative surgery,9th edition.

ORTHOPAEDICS
(Phase III – 7th, 8th & 9th Terms)

a) Objectives

Knowledge

The student shall be able to:

1. Explain the principles of recognition of bone injuries and dislocations;
2. Apply suitable methods to detect and manage common infections of bones and joints;
3. Identify congenital, skeletal anomalies and their referral for appropriate correction or rehabilitation.
4. Recognize metabolic bone diseases as seen in this country;
5. Explain etiology, pathogenesis, manifestations, and diagnosis of neoplasms affecting bones.

Skills

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

1. Detect sprains and deliver first aid measures for common fractures and sprains and manage uncomplicated fractures of clavicle, Colle's fracture, and phalanges fractures;
2. Use techniques of splinting, plaster, immobilization;
3. Manage common bone infections;
4. Advise aspects of rehabilitation for polio, cerebral palsy and amputations.

Application

Be able to perform certain orthopedic skills, provide sound advice of skeletal and related conditions at primary or secondary health care level.

Integrated teaching

1. With surgery: Trauma, diabetic foot, deep venous thrombosis
2. With Radiology:Bone tumours, bone infection
3. With Paediatrics: Rickets, scurvy, congenital talipes equino varus deformity and developmental dysplasia of hip.

b) Course Contents

TRAUMATOLOGY:

Injuries of Bone and joints:

Fracture
general types
healing of fractures
principles and management
- diagnosis methods of reductions
- immobilization
- complications of fractures
management of open fractures
- pathological fractures.
Dislocations and subluxations-mechanism, clinical features and management.

I. Injuries of upper extremity:

Injuries of shoulder , arm & forearm.
Fracture clavicle, injuries of acromio clavicular joints.
Fracture scapula, upper end of humerus.
Dislocation of shoulder—acute and recurrent.
Fracture shaft humerus.
Fractures around the elbow, radius, ulna.
Monteggia fracture-dislocation - Injuries around the wrist. Fracture scaphoid bone.
Dislocation of lunate.

Injuries of the hand: Fractures of metacarpals and phalanges.
Bennett fracture dislocation, Tendon injuries.
POP slab application.

Must know: Colles fracture, supracondylar fracture of humerus, anterior shoulder dislocation, posterior elbow dislocation, monteggia fracture, gallezzi fracture, nerve injuries- radial nerve, median nerve, ulnar nerve, brachial plexus, vascular injuries- brachial artery.

Desirable to know: Clavicle fracture, scapular fracture, proximal humerus fracture, humerus shaft fracture, fracture both bones forearm and scaphoid fracture.

II. Injuries of Lower Extremity:

Dislocation of hip, Fracture neck of femur,
trochantric fracture,
fracture shaft femur.
Injuries - of knee-

fracture tibia,fracture dislocation of ankle, fracture calcaneum.
Traction splintage
-below knee slab and above knee slab.

Must know: Dislocations of hip joint, fracture of femur neck, femur intertrochantric fracture, patellar fractures, ankle fractures, nerve injuries- sciatic nerve, common peroneal nerve, vascular injuries- popliteal artery.
Desirable to know: Pelvic fractures, femur shaft and distal femur fractures, tibial plateau fractures, ligamentous injuries of knee joint.

III. Injuries of the Spine:

Incidence-mechanism, types, clinical features of cord injury, traumatic Paraplegia,
Must Know: Whiplash injuries, traumatic paraplegia
Desirable to know: Fractures and fracture dislocation of spine.

IV. Vascular Injuries:

Types, sub fascial compression, Brachial artery injury, Popliteal artery injury, Tibial artery injury.

V. Amputations: General indications , levels, technique of above knee amputation, below knee stump, Syme`s amputation, upper limb amputation, prosthesis.

Upper limb
Must know: Above elbow and below elbow amputations.

Lower limb
Must know: Above knee and below knee amputations.
Desirable to know: Syme's amputation.

Prosthesis:
Must Know: SACH foot, Jaipur foot, Madras foot
Desirable to Know: Patellar tendon bearing functional bracing.

COLD ORTHOPAEDICS:

I. Deformities: General, congenital, acquired, principles of management, splints, Club foot, Developmental dysplasia of hip, Congenital skeletal limb deficiencies,

Must Know: Congenital Talipes Equinus Varus deformity (club foot), Developmental dysplasia of hip joint (DDH)

Desirable to Know: Congenital Limb deficiencies.

II. Regional Conditions

Neck :Torticollis, Inter vertebral disc prolapse, Cervical rib
Shoulder, elbow arthritis, painful arc syndrome, Tennis elbow,
Cubitus Varus –Valgus deformities.
Wrist and Hand: wrist drop, claw hand, ganglion, Dupytrens contracture, deQuervain's disease, trigger thumb , Carpal tunnel syndrome
Spine: Backache examination, Intervertebral disc prolapse, Spondylolisthesis
Hip: Clinical Examination, Perthe's disease
Knee: Genu valgum , varum , recurvatum, recurrent dislocation of Patella
Semi membranous Bursa.
Foot: Plantar Fascitis, Flat foot, Foot drop

Must Know: Torticollis, cervical rib, tennis elbow, painful arc syndrome, cubitus varus, ganglion, dupytren's contracture, de quervain's disease, carpal tunnel syndrome, genu valgum, genu varum, foot drop, plantar fascitis, claw hand.
Desirable to Know: Lumbar disc prolapse, frozen shoulder, wrist drop, trigger finger, back examination, spondylolisthesis, perthes disease, recurrent dislocation of patella, bursae around knee joint, flat foot.

III. Neuromuscular Disorders
Cerebral Palsy: Clinical features, management
Anterior Poliomyelitis: pathology ; clinical features management, surgery.
Leprosy: pathology ,Orthopaedic problems - Claw hand, Foot drop - Wrist drop
Rehabilitation.

Must know: Claw hand, wrist drop, foot drop.
Desirable to know: Cerebral palsy, Poliomyelitis, Leprosy

IV. INFECTIONS:
Infections : Pyogenic osteomyelitis, acute, chronic, subacute & Brodie's abscess Mycotic infections, Syphilitic lesions.
Disease of joints : Clinical examination, synovial fluid analysis, septic arthritis
Rheumatic, Rheumatoid diseases, Haemophilic arthritis.

Bone and Joint Tuberculosis :

Aetiopathogenesis , clinical features ,management.
Tuberculosis of spine, Pott's paraplegia,
Tuberculosis of hip knee and other joints.

Must know: Acute and chronic osteomyelitis, Brodie ‘s abscess, septic arthritis of hip and knee joint, tuberculosis of hip joint, knee joint and spine(Pott ‘s spine)
Desirable to know: Mycotic infections, syphilitic infections.

V. Metabolic Disorders:
Metabolic disorders: Rickets, Osteomalacia , Osteoporosis, Scurvy , Gout

Must Know: Rickets, osteomalacia
Desirable to know: Scurvy, gout, osteoporosis

VI .Tumours:
Benign and malignant bone tumours
Benign : Osteochondroma, Enchondroma
Malignant: Osteosarcoma, Osteoclastoma, Ewing’s tumour, Multiple myeloma, secondaries

Must Know: Osteochondroma, osteoclastoma, Osteosarcoma, secondary deposits in the bone
Desirable to know: Enchondroma, Ewings sarcoma, Multiple myeloma

VII. Physical Medicine& Rehabilitation :

Short wave diathermy, interferential therapy, wax bath, ultrasound therapy, lumbar and cervical traction, continous passive motion.

Must Know: Short wave diathermy, wax bath, continous passive motion.
Desirable to know: interferential therapy, ultrasound therapy, lumbar and cervical traction,

VIII. Bio-Medical Waste:
Types, potential risks and their safe management. (See Annexure 3)

IX. Miscellaneous:
Miscellaneous : Paget disease, Various types of bone cysts.

Must Know: Rheumatoid arthritis, osteoarthritis
Desirable to know: paget’s disease, bone cyst, haemophilic arthritis

X. Innovative Teaching/ Learning Methods:
1. Objective structural clinical examination (OSCE)
2. Integrated teaching
3. Student seminars
4. Web teachings.

c) **Teaching Hours**
Theory classes : 100 Hours, including 20 hours of integrated teaching.
Clinical postings: 10 weeks (See Table 2)

Internal assessment: No of tests- three
Methodogy to be adapted: Theory and clinicals.

Scheme of examination: See section (d) under Surgery

Books recommended:

1. Natarajan M., Textbook of Orthopaedics — Vol. I & II
2. Maheshwari, Textbook of Orthopaedics.
3. Crawford Adams, Outline of Orthopaedics. Fractures and dislocation, 9th edition, ELBS, 1987.
4. Crawford Adams, Outline of Orthopaedics, 11th ed, ELBS; 1990.
5. Baily & Love, A Short Practice of Surgery, 25th ed., (International Students Edition); 2007.
6. Graham Apley, System of Orthopaedics.
7. Das S, Clinical Methods in Surgery, 6th ed, S Das .13 Old Mayors, Calcutta; 1996.

RADIO-DIAGNOSIS AND IMAGING

As specified by Medical Council of India

a) Goal

The broad goal of teaching the undergraduate medical students in the field of Radio diagnosis should be aimed at making the students realise the basic need of various radio diagnostic tools in medical practice. They shall be aware of the techniques to be undertaken in different situations for the diagnosis of various ailments as well as during prognostic estimations.

b)Objectives

Knowledge

The student shall be able to:

1. Understand basic of x-rays production, its uses and hazards.

2. Appreciate and diagnose changes in bones — like fractures, infections,tumours and metabolic

bone diseases;

3. Identify and diagnose various radiological changes in disease conditions of chest and mediastinum, skeletal system, Gastro intestinal Tract, 1-lepatobiliary system and Genito Urinary (G.U) system;

4. Learn about various imaging techniques, including isotopes Computerized Tomography (C.T), Ultrasound, Magnetic Resonance Imaging (M.R.l) and D.S.A.

Skills

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

1. use basic protective techniques during various imaging procedures;
2. interpret common x-ray, radio-diagnostic techniques in various community situatior
3. Advise appropriate diagnostic procedures in specialized circumstances to appropriate specialists.

Departmental Objectives

At the end of the course in Radiodiagnosis, the student should:

1. Be familiar with various imaging techniques, their advantages and disadvantages.
2. Be aware of indications for common x-ray investigations and view to be taken for various organs. Know the indications for C.T. Scan and Ultrasound.
3. Be aware of radiation hazards and protection with reference to self, patient and the public

c) Course Contents

I. RESPIRATORY SYSTEM

1. Diagnosis of common conditions like tuberculosis,consolidation,pleural effusion, pneumothorax, lung abscess, collapse, bronchogenic carcinoma and mediastinal masses.
2. Differential diagnosis of mediastinal masses.
3. Indications for bronchography, tomography and CT scan.

II. CARDIOVASCULAR SYSTEM

1. Normal topography of heart, cardiomegaly.
2. Common rheumatic heart diseases and pericardial effusion.

III. GASTROINTESTINAL SYSTEM

1. Diagnosis of acute abdominal conditions like intestinal obstruction, perforation.
2. Indications and contraindications for Barium studies.
3. Differential diagnosis of calcification and stones on plain x-ray.
4. Diagnosis of gastric ulcer / duodenal ulcer / cancer stomach / oesophageal cancer on Barium studies.

IV. OBSTETRICS AND GYNAECOLOGY

1. Radiation hazards to a pregnant woman and child. Appropriate time to take x-rays during pregnancy and the number of views to be taken.

V. SKELETAL SYSTEM

1. Diagnosis of common fractures, Caries spine, osteomyelitis of bones, nutritional deficiencies like rickets, and common bone tumours and diseases of joints.

VI. CENTRAL NERVOUS SYSTEM

1. Signs of raised intra cranial tension, ICT on plain x-rays of skull.

VII. EXCRETORY SYSTEM

1. Identification of renal claculi.

Skills

1. Interpret skiagrams of common diseases.

d) RADIOTHERAPY

Course Description

A. Specified by Medical Council of India

a) Goal

The broad goal of teaching the undergraduate medical students in the field of Radiotherapy is to make the students understand the magnitude of the ever-increasing cancer problem in the countly. The students must be made aware about steps required for the prevention and possible cure of cancers.

b) Objectives

Knowledge

The student shall be able to:

1. identify symptoms and signs of various cancers and their steps of investigations and management;
2. explain the effect of radiation therapy in human beings and the basic principles involved in it;
3. know about radioactive isotopes and their physical properties;
4. be aware of the advances made in radiotherapy in cancer management and knowledge of various radio therapeutic equipment while treating a patient.

Skills

At the completion of the training programme, the student shall be able to:

1. take a detailed clinical history of the case suspected of having a malignant disease;
2. assist various specialists in administration of anticancer drugs and in application and use of various radiotherapeutic equipment, while treating a patient.

Departmental Objectives

At the end of training in Radiotherapy, the student should be able to:

1. Exhibit awareness of the principles of radiotherapy, the radio-responsiveness of various tumours and management of common cancers like cervical, breast and oral cancers.
2. Refer for further consultation at appropriate time without delay.
3. State general complications of irradiation and their management.
4. List common chemo-therapeutic drugs and toxicity of the same.
5. Implement health education programmes regarding prevention and early diagnosis of tobacco related cancers, cervical cancers, and breast cancers.
6. Know the general outlines of use of radio-isotopes in diagnosis and therapy.

c) **Course Contents**

1. Physical principles of radiotherapy.
2. Principles of chemotherapy.
3. Prevention of cancer.
4. Early diagnosis of cancer.
5. Principles of nuclear medicine.

6. Radio responsiveness of various tumours and management.
7. Common radiation reactions and management.
8. Radiotherapy in some of the commonly seen cancers.
9. Chemotherapy in certain cancers like childhood tumours, leukemia and lymphomas.
10. Radio-isotopes in diagnosis and therapy.

d) **Teaching Hours**

Radio diagnosis and Radiotherapy

Theory: 20 hours Clinical Posting: 2 weeks

DEPARTMENT OF ANAESTHESIOLOGY

Goals:-

The undergraduate students should realise the importance of safe forms of anaesthesia for different kind of surgeries. They should also know the importance of maintenance of patency of the airway in an unconscious patient – anaesthetised or otherwise.

Objectives:-

The undergraduate shall be able to

1. Enumerate different local anaesthetic agents, general anaesthetic agents, muscle relaxants, sedatives and analgesics.
2. They shall also understand the indications, mode of administration, contraindications, and side effects of the agents mentioned above.
3. They shall be trained in CPBR on manikins.

COURSE CONTENTS

THEORY CLASSES

Sl.No.	TOPIC
01.	Introduction to Anaesthesiology.
02.	Pre-anaesthetic evaluation of Patients.
03.	Anatomy of upper airway.
04.	Respiratory obstruction and Management of airway in an unconscious patient.
05.	Various method of O_2 & O_2 & CO_2 transport.
06.	Muscle relaxants & reversal agents.
07.	Inhalational anaesthetic agents.
08.	Intravenous Anaesthetic agents.
09.	Local anaesthetic agent and simple blocks.
10.	Spinal & Epidural Anaesthesia.
11.	Blood & Blood component therapy.
12.	Crystalloids & Colloids.
13.	Monitoring during Anaesthesia.

14.	ICU & Role of Anaesthesiologists in ICU.
15	Role of Anaesthesiologists in acute and chronic pain relief.
16.	History & modern trends in practice of Anaesthesia.
17.	Day case anaesthesia.

PRACTICAL CLASSES

1.	Boyles machine.
2.	Intubation & and airway gadgets.
3.	C.P.B.R.

RECOMMENDED BOOKS FOR REFERENCE

Recent editions of the following books

1.Lee's synopsis of Anaesthesia: Atkinson,Rushman & David
2.Anaesthesia & Co-existing diseases:Robert K.Stoelting & Stephen.F.Dierdorf.
3.Clinical Anaesthesiology: G. Edvard. Morgan. Jr, Maged.S. Mikhail, Micharl.J.Murray. & C Philip Larson-Jr
4.Pharmacology & Physiology in Anaesthetic Practice :Stoelting R.K.

SCHEME OF EXAMINATION OF SURGERY and its ALLIED SPECIALITIES

Internal Assessment: Total Marks :100, (Theory 60 and Clinical 40)

Theory: 60 Marks *[45 for surgery and 15 for orthopaedics]

Minimum of three examinations are recommended. The 9th term examination preceding the university examination may be similar to the pattern of university examination. Average of any two best marks obtained in the notified internal examination be taken into consideration for calculating internal assessment. The total marks be reduced to 45 and sent to the University.

Among the theory tests,one test shall be based on MCQ's of 100 marks.

Clinical:40 Marks [30 marks for surgery and 10 marks for orthopeadics]

There will be ward-leaving examination at the end of each posting. Average of any two best marks obtained in the clinical examination shall be reduced to 30 marks and sent to the university. One of the clinical exam or ward leaving test shall be OSCE.

The internal assessment marks both theory and practical obtained by the candidates should be sent to the University at least fifteen days prior to the commencement of theory examination. Note that a student shall secure at least 35% marks of the total marks fixed for internal assessment in a particular subject in order to be eligible to appear in final university examination.

Note: The internal Assessment for surgery shall consist of 45 marks for General Surgery and 15 marks for Orthopaedics in Theory component and 30 marks for General Surgery and 10 marks for Orthopaedics in clinical component.

<u>Splitting of marks in surgery</u>

20% as stipulated

Theory : 45

-Break up : Test = 30/ best 3 among the conducted tests will be taken and reduced to 30.One test of 100 marks in the form of MCQs

-Record book = 5

-ICMR projects/assistance to any research activity = 5

- Participation in student seminar and group discussion = 5

  = 30 + 5 + 5 + 5 = 45

I. A. PRACTICALS

20% as stipulated

Total = 30

Ward leaving tests after clinical posting minimum one shall be

OSCE of 10 marks

5 marks for best of 3 ward leaving tests, 5+5+5+=15

10 marks for OSCE

5 marks for participation in dept. extension activities

Total 15+10+5= 30

University Examination

Total marks: 400 (Theory 200, Viva-Voce 40 and Clinical 160)

Theory (Written)

There shall be **two papers each carrying 100 marks**; each paper shall be of three hours duration. The pattern of **questions would be of three types.**

Long essay question	-	each question carrying	10 Marks
Short essay question	-	each question carrying	5 Marks
Short answer question	-	each question carrying	3 Marks

Distribution of subjects in Paper I and Paper II for the University examination shall be as follows :-

Paper-I

Max.Marks – 100 **Time 3 hours.**

Section A (Gen.Surgery)

1.Long essay questions	**2x10 Marks each**	**-**	**20**
2.Short essay questions	**3x5 marks each**	**-**	**15**
3.Short answers questions	**5x3 Marks each**	**-**	**15**
	Total		**50 Marks**

Section B (Orthopedics)

1.Long essay	**2x10 marks each**	**-**	**20**
2.Short essay	**3x5 marks each**	**-**	**15**
3.Short answers	**5x3 Marks each**		**-15**
		Total-	**50 Marks**

PAPER-II

Max.Marks: 100 **Time 3 hrs**.

(Gen.surgery including anaesthesiology, Dental diseases, Radiology, Electrotherapeutics and their application in surgery)

1.Long essay	**2x10 marks each**	**-**	**20**
2.Short essay	**10x5 marks each**	**-**	**50**
3.Short answers	**10x3 marks each**	**-**	**30**
	Total	-	**100 Marks**

Clinical Examination: 160 marks

Surgery : 120 marks (one long case of 60 marks and
Two short cases of 30 marks each)
Orthopaedics : 40 marks (Two short cases, 20 marks each)

Viva-voce Examination: 40 marks

Surgery 30 marks
Orthopaedics 10 marks

OBSTETRICS & GYNAECOLOGY

As Specified by Medical Council of India

Obstetrics and Gynecology includes family welfare and family planning.

a)Goal

The broad goal of the teaching of undergraduate students in Obstetrics and Gynecology is that he/she shall acquire understanding of anatomy, physiology and pathophysiology of the reproductive system and gain the ability to optimally manage common conditions affecting it.

b)Objectives

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

1. Outline the anatomy, physiology and pathophysiology of the reproductive system and the common conditions affecting it;
2. Detect normal pregnancy, labor, puerperium and manage the problems he/she is likely to encounter therein;
3. List the leading causes of maternal and perinatal morbidity and mortality;
4. Understand the principles of contraception and various techniques employed, methods of medical termination of pregnancy, sterlisation and their complications.
5. Identify the use, abuse and side effects of drugs in pregnancy, pre menopausal and post menopausal periods
6. Describe the national programme of maternal and child health and family welfare and their implementation at various levels;
7. Identify common gynecological diseases and describe principles of their management;
8. State the indications, techniques and complications of surgeries like Caesarean section, laparotomy, abdominal and vaginal hysterectomy, Fothergill's operation and vacuum aspiration for Medical Termination of pregnancy (MTP).

Skills

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

1. Examine a pregnant woman, recognize high risk pregnancy and make appropriate referrals;
2. Conduct a normal delivery, recognize complications and provide postnatal care;
3. Resuscitate new born and recognize congenital anomalies;
4. Advise a couple on the use of various available contraceptive devices and assist in insertion and removal of intra-uterine contraceptive devices;
5. Perform pelvic examination, diagnose and manage common gynecological problems including early detection of genital malignancies;
6. Make a vaginal cyotological smear, perforem a post coital test and wet vaginal smear examination for Trichomonas vaginalis, Moniliasis & papsmear.
7. Interpret data of investigations like biochemical, histopathological radiological, ultrasound etc.

Integration

The student shall be able to integrate clinical skills with other disciplines and bring about coordination of family welfare programme for the national goal of population control.

Departmental Objectives

At the end of training in Obstetrics and Gynaecology, MBBS student will be able to;

Knowledge

1. 1. Appreciate the socio-cultural, economic and demographic factors that influence the practice of Obstetrics and Gynaecology.
2. 2.Appreciate the principles of reproductive anatomy and physiology
3. Understand the preconception, antenatal, intranatal and postnatal factors including drugs that affect the mother and foetus.
4. Recognise the changes and adaptation that occur in the mother during pregnancy, labour & Puerperium.
5. 5.Impart antenatal care, detect deviations from normal pregnancy and refer risk cases appropriately
6. manage normal labor, recognize the factors that may lead to complications and refer such cases appropriately
7. Institute primary treatment in Obstetrics and Gynaecology emergencies
8. Resuscitate and take adequate care of the new born.
9. Assist couples wth infertility and those requiring contraception.
10. Know the aetio-pathology and management of menstrual abnormalities
11. Know about the benign and malignant tumors of the genital tract and appreciate the need for screening and prevention.
12. Recognise the importance of infection and other diseases of the genital tract and know about the displacements of genital tract and injuries.
13. Understand the implication, of mediocolegal and ethical issues concerning the specialty .
14. Acquire communication, decision making and managerial skills.

General guidelines for training

1. Students shall attend maternity hospital or maternity wards of a general hospital including i) antenatal care, ii) the management of puerperium. A minimum period of 6 months in the inpatient and outpatient sections including family welfare planning
2. Of this period of clinical instruction, not less than one month shall be spent as a resident pupil in the labor room of a maternity ward. During this period, the student shall conduct at least 5 deliveries under adequate supervision and assist in 10 other cases of deliveries
3. A certificate showing the number of cases attended by the student shall be signed by a responsible medical officer or the staff of the hospital and shall state;

a) that the student has been present during the course of and personally conducted each case, making the necessary abdominal and other examinations under the supervision of the certifying officer who shall describe his official position.
b) That satisfactory written history of the cases conducted including wherever possible antenatal and postnatal observations were presented by the student and initiated by the supervising officer.

4th TERM SYLLABUS;

OBSTETRICS

1.**ANATOMY OF THE FEMALE REPRODUCTIVE TRACT**:

1. Basic Anatomy: -2hours
   Relationship to other pelvic organs. Applied anatomy as related to Obstetrics & Gynaecological surgery.

2.PHYSIOLOGY OF CONCEPTION -2hours

1. Ovulation, menstruation, fertilization & implantation.
2. Gametogensis.

3.DEVELOPMENT OF FOETUS AND PLACENTA - 2 hours

1. Basic embryology, factors influencing fetal growth & development,
2. Anatomy and development of placenta

4.DIAGNOSIS OF PREGNANCY -2hours

1. Clinical features & differential diagnosis of pregnancy
2. Immunological tests & ultra sonogram.

5.MATERNAL CHANGES IN PREGNANCY -2hours

1. Genital tract, cardiovascular system and hematology.
2. Respiratory and gastrointestinal system.

6.ANTENATAL CARE -3hours

1. Objectives of antenatal care; assessment of period of gestation, detection of normal foetal pelvic relation (obstetrical palpation).
2. Clinical monitoring of maternal and Foetal well-being (gravidogram), basic investigations
3. Advise regarding nutrition; prescribing in pregnancy; immunization against tetanus.

7.NORMAL LABOR: -2hours

Physiology, mechanism in occipito anterior position, monitoring, partogram; Conduct of labor; pain relief.

8. NORAMAL PUERPERIUM. -2hours

GYNAECOLOGY

I.PHYSIOLOGY OF VAGINAL DISCHARGE -1hour

1. Clinical characteristics: Biology of vagina, cytology of vagina, natural defence mechanism against infections, bacterial flora of vagina.

II.PATHOLOGICAL VAGINAL DISCHARGE -2hours

1. Aetiology, characteristics; clinical recognition; investigation, treatment of common causes; genital hygiene.

6TH TERM SYLLABUS:

OBSTETRICS

BRODER PERSPECTIVES

1. **Vital statistics:** birth rate, maternal mortality, perinatal & neonatal mortality, live birth, still birth, abortion, period of viability including definition of all above. -2hours

2. **Foetal well-being; biophysical monitoring; pelvic assessment**. – 2hours

3. **PREGNANCY INDUCED HYPERTENSION** : - 3hours
   a) Preeclampsia: Definition; early detection ; investigations and management
   b) Eclampsia : Aetiopathology, differential diagnosis of convulsions in pregnancy, complications.

4. **ANEMIA IN PREGNANCY** -2hours

Aetiology, classification, diagnosis, investigations, adverse effects in the mother and foetus, management.

5. **MEDICAL TERMINATION OF PREGNANCY** -1hour

Legal aspects; indications, methods; complications & management of complications.

GYNAECOLOGY

1.PUBERTY - 2hours

2.AMENORRHOEA – 2hours

Primary & secondar y amenorrhoea; causes, principles of management.

3. **DYSFUNCTIONAL UTERINE BLEEDING**. – 1hour

Aetipathology, classification; clinical aspects and diagnosis, principles of investigation and management..

4.GENITAL INFECTIONS

- STD in the female. - 1hour
-Tuberculosis of female genital tract -1hour
-Pelvic inflammatory disease -1hour

5.DISPLACEMENTS OF UTERUS, GENITAL PEOLAPSE -2hours

6.BENIGN TUMOURS OF CERVIX & UTERUS, - 2hours

1. Cervix: cervical erosion, ectropion, chronic cervicitis
2. Benign lesions of uterus – fibroid

7.CARCINOMA CERVIX - 2 hours

Aetiopathology, classification ,clinical features, screening procedures, Investigations, diagnosis and principles of management

7th TERM SYLLABUS

OBSTETRICS

I.**COMPLICATIONS OF EARLY PREGNANCY**

1. Abortions: definition, types, causes & Management - 1hour
2. Recurrent abortions - 1hour
3. Ectopic pregnancy: Causes, clinical features, differential diagnosis of acute - 2hrs Abdomen, & conservative management of ectopic pregnancy, principles of surgical management
4. Trophoblastic diseases: Aetiopathology, clinical, features, differential diagnosis, Principles of management, follow up. Chorio carcinoma - 2hours
5. Hyperemesis gravidarum: Definition, aetiology, clinical features & management. -1hour

II**. MEDICAL DISORDERS LIKE HEART DISEASE/DIABETES MELLITUS & URINARY TRACT INFECTION** - 3hours

a)Clinical features; early detection; effect of pregnancy on the disease & impact of the disease on pregnancy.

b) Complications & management of the disease

III. GYNECOLOGICAL DISORDERS IN PREGNANCY: -2hours

Fibroid in pregnancy, ovarian tumour, Retroverted gravid uterus, Genital prolapse & pregnancy, cancer cervix with Pregnancy.

IV.COMPLICATIONS OF THIRD STAGE OF LABOR -2hours

Complications, predisposing factors, prevention,management of atonic PPH & Management of Traumatic PPH.

V.BREAST FEEDING -1hour

Physiology of lactation, care of breasts, counseling regarding Breast feeding, mastitis and breast abscess.

VI.ABNORMAL PUERPERIUM

clinical features of complications, recognition and principles of management, prevention & Treatment of puerperal pyrexia. -2 hours

VII. RH ISO IMMUNIZATION:

Mechanism, Foetal complications. ; prophylaxis, management -1 hour

SYLLABUS OF 8th TERM

OBSTETRICS

1. **ANTEPARTUM HAEMORRHAGE/ CLASSIFICATIONS,AETIOPATHOLOGY AND MANAGEMENT. -2hours**
   a) Accidental haemorrhage
   b) Placenta previa

2. CONTRACTED PELVIS, CEPHALOPELVIC DISPROPORTION, OBSTRUCTED LABOUR -3hours

3. ABNORMAL PRESENTATIONS & ABNORMAL POSTION.
occipito posterior -1hour
breech delivery.
face and brow presentation - -1hour
Cord prolapse – -1hour

4. MULTIPLE PREGNANCIES: CAUSES, CLINICAL FEATURES, INVESTIGATIONS, COMPLICATIONS, PRINCIPLES OF MANAGEMENT.1hr

5. INDUCTION OF LABOR -1hour

6. UTERINE DYSFUNCTION:
7. Foetal distress :causes; diagnosis, management & prevention; -2hours

8. Neonatal problems and resuscitation -1hour

9. Pre-term labor, P.R.O.M -1hour
Post maturity -1hour
Intra-uterine death -1hour

10.Teratogenesis, placental barrier

SYLLABUS OF 8th TERM
GYNAECOLOGY

1.MALFORMATIONS OF GENITAL TRACT -2hours
2.SEX AND INTERSEXUALITY -2hours

3. FERTILITY AND INFERTILITY -2hours

1. Causes in male and female; physical examination of both female and male partners; essential investigations and interpretation
2. Management options

4.. ENDOMETRIOSES -1hour

1. Aetiopathology' clinical features; investigation and management
2. Implications on health and fertility

5. GENITAL INJURIES AND FISTULAE -2hours

1. Injuries of female genital tract ; Causes, clinical features, prevention, management
2. Diseases of Urinary system

6. MENOPAUSE -1hour

7.HORMONES IN GYNAECOLOGY -2hours

8.BENIGN LESIONS OF VULVA & VAGINA & ENDOMETRIUM -1hour

9.PRECANCEROUS LESIONS OF GENITAL TRACT -1hour
Screening procedures in gynaecology

10. MALIGNANT LESIONS OF VULVA & VAGINA -1hour

11.DISEASES OF BROAD LIGAMENT, FALLOPIAN TUBES -1hour

12.LOW BACK ACHE -1hour

13.PSYCHOSOMATIC PROBLEMS IN GYNAECOLOGY -1hour

14.FAMILY PLANNING AND CONTRACEPTION -5hours

9th TERM SYALLABUS

OBSTETRICS

I. OPERATIVE OBSTETRICS -6hours

-Indications, technique, and complications of episiotomy
- vacuum extraction & low forceps,
- Indication and steps of operation of caesarean section,
- assisted breech delivery, external cephalic version,
-cervical cerclage,
-Destructive operations.

II.POST-CAESAREAN PREGNANCY -1hour

III.PHARMACO THERAPEUTICS IN OBSTETRICS -2hours
Oxytocin, prostaglandins,Antihypertensives, Tocolytics, anticonvulsants,

IV.SPECIAL TOPICS IN OBSTETRICS -3hours
High Risk pregnancy & Immunology in obstetrics
shock in obstetrics, Blood coagulation disorders in obstetrics.

V.CAUSES AND PREVENTION OF MATERNAL MORBIDITY AND MATERNAL MORTALITY IN HOSPITAL AND COMMUNITY SETTINGS

VI. REPRODUCTIVE AND CHILD HEALTH PROGRAMME (RCH)

VII.MEDICO LEGAL ASPECTS & DAY CARE IN OBSTETRICS -1hour

INTRODUCTION & FAMILY PLANNING -1hour
I.U.C.D's -1hour
HORMONAL CONTRACEPTION -1hour
SURGICAL STERLISATION -1hour
EMERGENCY CONTRACEPTION -1hour

9th TERM SYALLABUS
GYNAECOLOGY

1. **Carcinoma of Endometrium** **-1hour**

2. **Ovarian tumors**
   a) **Benign ovarian tumors** **-3hours**
   b) **Malignant ovarian tumors**

3. **RADIOTHERAPY IN GYNAECOLOGY** **-1hour**

4. **CHEMOTHERAPY IN GYNAECOLOGY** **-1hour**

5. **IMAGING TECHNIQUES IN GYNAECOLOGY** **-1hour**

6. **ENDOSCOPY IN GYNAECOLOGY** **-1hour**

7. **DISEASES OF BREAST** **-1hour**

8. **OPERATIVE GYNAECOLOGY**
   Dilatation and Curettage in gynaecology and fractional curettage **-1hour**
   Endometrial biopsy and tubal patency test. **-1hour**
   Amputation of cervix, trachelorrhaphy, .Fothergills operation **-1hour**
   vaginal hysterectomy with pelvic floor repair **-1hour**
   Abdominal hysterectomy. **-1hour**
   Laparotomy for ovarian tumours**.** **-1hour**

d) **Teaching Hours:**

Theory

Teaching of Obstetrics and Gynaecology extends from 4th term to 9th term, during II and III Phase of M.B.B.S. Total number of teaching hours would be 300 hours, out of which 40 hours are for integrated teaching.

Phase	**Term**	**No. of classes per week**	**No. of Hours**
Phase II	4h term	I class	20
Phase II	5th term	nil	Nil
Phase II	6th term	1 class	20
Phase III	7th term	I class_	20
Phase III	8th term	two theory classes of 1 hr one seminar of 2 hrs one tutorial of 2 hrs	40 40 40
Phase III	9th term	two theory classes of 1 hr one seminar of 2 hrs one tutorial of 2 hrs	40 40 40
Total No. **of teaching hours* 300**			

* Out of which 40 hours are for integrated teaching. Seminars/Tutorials may be used for integrated teaching

Clinical Course: Hospital Postings:

During Third to Ninth terms, clinical postings of three hours duration daily. This includes maternity training & training in Family welfare planning.

Hospital Postings

1st Posting	3rd Term	-7weeks
2nd Posting	4th Term	-7weeks
3rd Posting	8th Term	-6 weeks
4th Posting	9th Term	-4 weeks
	TOTAL:	-24 weeks

The Period of training suggested in minimum adjustments where required depending on the availability of time be made.

Integrated Teaching - 40 hours

Topics for integrated teaching with the other departments:

Sl. No.	Topics	No.of Hour(s)	Department
Pr 1	Family planning	4	Post partum centre
ob 2	Embryology –Integrated foetal growth and development	4	Anatomy
ab 3	Physiological changes in pregnancy with maternal adaptation	4	Physiology
4	Rational use of drugs and Prescribing in pregnancy	4	Pharmacology
5	Nutrition and anaemia in pregnancy	4	Medicine
6	Urological problems in Obst, & Gynaec	2	Urology
7	Acute abdomen-management & care of the abdomen	4	Surgery
8	Neonatal resuscitation	4	Pediatrics
9	Neonatal problems (Jaundice,umbilical,infection,convulsions)	2	Pediatrics
10	Ultrasound in Obstetrics	2	Radiology/Radio/diagnosis
11	Radiology in obstetrics	1	Radiology
12	Gynaecological malignancies	2	Pathology
13	MCH services: objectives & Implementation	2	Community medicine
14	Psychiatric problems related to obst. gynec	1	Psychiatry

SCHEME OF EXAMINATION: OBSTETRICS AND GYNAECOLOGY

Internal Assessment : Total marks:100, (Theory 60 and clinical 40)
Theory: 60 marks
Minimum of three examinations are recommended. The 9th term examination preceding the University examination will be preliminary exam.. Average of any two best marks obtained in the notified internal examinations be taken into consideration for calculating internal assessment. The total marks be reduced to 60 and sent to the university.
Clincal: 40 marks:
There will be ward leaving examinations at the end of each postings 10 marks is allotted to record. Average of any two best marks obtained in the clinical examinations shall be reduced to 40 marks and sent to the university. ANC, Labour,PNC, Gynaec and planning cases have to be recorded.
The internal assessment marks both theory and practical obtained by the candidates should be sent to the university at least fifteen days prior to the commencement of theory examination. Note that a student shall secure at least 35% marks of the total marks fixed for internal assessment in a particular subject in order to be eligible to appear in final university examination.

University Examination: Total marks : 400 (Theory 200, Viva-voce 40 and clinical 160)
Theory (written paper):

There shall be two papers each carrying 100 marks. The pattern of questions would be of three types.

1. Long essay, 2 questions each question carrying 10 marks	=	20 marks
2. Short essay questions. 10 x each question carrying 5 marks	=	50 marks
3. Short answer questions, 10 x each question carrying 3 marks	=	30 marks

Distribution of subjects in Paper I and Paper II, for the University examination shall be as follows :

Paper I - Obstetrics including social obstetrics

Paper II - Gynaecology, Family Planning and Demography

(Shall contain one question on basic sciences and allied subjects)

Clinical.: 160 marks Two cases

One long case of Obstetrics and one long case of Gynaecology — 80 marks each.

Viva-voce: 40 marks
Componenets are:

Insatruments	-10
Specimen,X-ray,USG	-10
Dummy & pelvis	-10
Family planning & drugs	-10
Record ANC,PNC,Gynaec	

f) Recommended Books

Obstetrics :

1. Mudaliar & Menon, Clinical Obstetrics, 9th edition, Orient Longman.
2. Dutta D.C., Text book of Obstetrics including Perinatology and Contraception, 4th edition,
   New central Book Agency (P) Ltd., New Delhi, 1998.
3. Dawn C.S., Text Book of Obstetrics and Neonatology, 14th edition, Dawn Books, Calcutta, 2000.
4. Holland and Brews, Textbook of Obstetrics. 1 61h Edition, B. I. Publication, New Delhi, 1998. 2. Ohj
5. Shirish N. Daftery, Manual of Obstetrics, 161h edition, B I Churchill Livingstone, 1998.

Reference books:

1. Williams Obstetrics — Cunningham, Mc Donald & Gant, 20th edition
2. Dewhurst's Text book of Obstetrics & Gynaecology by whitfield C.R, 5 edition,

Gynaecology:

1. Padubidri VG and Shirish N Daftary, Shaw's A Text book of Gynaecology, 12th edition B. 1. Churchill Livingstone, New Delhi, 1999. Rs. 290.
2. Dutta DC, Text book of Gynaecology, 2nd edition, 1997.
3. Dawn CS, Text book of Gynaecology & Contraception, 12th edition, Dawn Books Calcutta, 1995.

Reference books

1. Jeffcoate Principles of Gynaecology, by MR. Trindall, 5th edition, Bullerworth Heinmans. 1997.

SECTION - IV

MEDICAL ETHICS

1. Introduction

Medical ethics is a systematic effort to work within the ethos of medicine, which has traditionally been service to sick.

There is now a shift from the traditional individual patient doctor relationship of medical care. With the advances in science and technology and the needs of patients, their families and the community, there is an increased concern with the health of the society. There is a shift to greater accountability to the society. Doctors and other health professionals are confronted with many ethical problems. It is, therefore, necessary to be prepared to deal with these problems.

In keeping with its goal to improve quality of education, BLDE University recommends introduction of medical ethics in the regular teaching of M.B.B.S. enurse beginning from first year and continuing till the end of internship.

2. Objectives

The objectives of teaching medical ethics should be to enable the students develop the ability to:

1. Identify underlying ethical issues and problems in medical practice
2. Consider the alternatives under the given circumstances, and edition.
3. Make decisions based on acceptable moral concepts and also traditions and practices

3. **Course Contents** (Syllabus)

1. Introduction to Medical Ethics
   What is Ethics
   What are values and norms
   Relationship between being ethical and human fulfillment
   How to form a value system in one's personal and professional life
   Hemmans, **Heteronomous Ethics and Autonomous Ethics**
   Freedom and Personal Responsibility.
2. Definition of Medical Ethics 6.
   Difference between medical ethics and bioethics
   Major Principles of Medical Ethics -

Beneficence	=	fraternity
Justice	**=**	**equality**
Self determination (autonomy)	=	liberty'

3. Perspectives of Medical Ethics

- The Hippocratic oath
- The Declaration of Helsinki
- The WHO Declaration of Geneva
- International code of Medical Ethics (1983)
- Medical Council of India Code of Ethics.

4. Ethics of the Individual

- The patient as a person
- The Right to be respected
- Truth and Confidentiality
- **The Autonomy of decision**
- The concept of disease, health and healing
- The Right to health
- Ethics of Behaviour modification
- The Physician Patient relationship
- Organ donation.

5. The Ethics of Human life

- What is human life?
- Critcia for distinguishing the human and the non-human
- Reasons for respecting human life
- The beginning of human life
- Conception, Contraception
- Abortion
- Prenatal sex-determination
- In vitro Fertilisation (IVF),
- Artificial Insemination by Husband (AIFI)
- Artificial insemination by Donor (AID)
- Surrogate motherhood,
- Semen Intrafallopian Transfer (SIFT)
- Gamete Intrafallopian Transfer (GIFT),
- Zygote Jntrafallopian Transèr (ZIFT) Genetic Engineering.

6. The Family and Society in Medical Ethics
    - The Ethics of human sexuality
    - Family Planning perspectives
    - Prolongation of life
    - Advanced life directives — The Living Will
    - Euthanasia
    - Cancer and Terminal Care
7. Death and Dying
    - Use of life-support systems
    - Death awareness
    - The moment of death
    - Prolongation of life
    - Ordinary and extraordinary life support
    - Advanced life directives
    - Euthanasia — passive and active
    - Suicide — the ethical outlook
    - The right to die with dignity

1. Professional Ethics
    - Code of conduct
    - Contract and confidentiality
    - Charging of fees, Fee-splitting
    - Prescription of drugs
    - Over-investigating the patient
    - Low — Cost drugs, vitamins and tonics
    - Allocation of resources in health care
2. Research Ethics
    - Animal and experimental research
    - Human experimentation
    - Human volunteer research Informed
    - Consent, Drug trails
3. Ethical work-up of cases
    - Gathering all scientific factors
    - Gathering all human factors
    - Gathering all value factors
    - Identifying areas of value conflict,
    - setting of priorities
    - Working out criteria towards decisions.

4. Teaching / Learning Experience

Classroom teaching would focus on professional relationship, patient-doctor relationship. issues at the beginning and end of life, reproductive technologies, resource allocation and health policy. It will also deal with values, ethical concepts and principles. Clinical ethics must be taught as part of bedside teaching. Group discussions, case studies, problem analysing and problem solving exercises may also be employed.

The teacher involved in teaching ethics should show how the ethical principles are applied on a day-to-day and patient to patient basis by: Demonstrating by example, how to identify and resolve a particular problem increasing the awareness and knowledge of students of the value dimensions of interactions with the patients, colleagues, relations and public.

Fostering the development of skills of analysis, decisions making and judgement.
Making the students aware of the need to respect the rights of the patient as also duties and responsibilities of the doctor.

Recommended distribution of Teaching hours in different phases of MBBS Course
Total Teaching Hours : 40

Phase I : Preclinical Period - **6** hours
2 hours each by Anatomy, Physiology, Biochemistry during the 1 year.

Phase II: Para clinical Period - **6** hours
2 hours each from Pharmacology, Pathology and Microbiology.

Phase III: Community Medicine - 4 hours
2 hours each from Ophthalmology and ENT = 4 hours.
2 hours each in two terms from Medicine, Surgery, and OBG=12 hours
8 hours from other clinical departments.

N.B.: The teaching of Medical Jurisprudence by the department of Forensic Medicine will continue as before.

5. Evaluation

All major subjects should have at least one short answer question on Medical Ethics appropriate for the subject introduced in the University question paper, and a few questions may be asked during the viva voce examination eg., basic principle in informed consent, confidentiality, etc.

6. Recommended Reading

1. Francis C.M., Medical Ethics, II Ed, 2004, Jaypee Frothers, New Delhi, Rs. 150/-.
2. Ethical Guidelines for Biomedical Research on Human subjects, indian Council of Medical Research, New Delhi. 2000.

SECTION-V

ANNEXURE - 1

Different methods recommended for internal assessment

The Medical Council of India has given some examples of methods for internal assessment of students, which may be followed by the colleges. They are:

1. Credit for preparation and presentation of seminars by students.
2. Preparation of clinical case for presentation.
3. Clinical case study/problem solving exercises.
4. Participation in project for health care in the community.
5. Proficiency in conducting a small research project or assignment.
6. Multiple choice questions (MCQ) test after completion of a chapter / system.

Each item shall be objectively assessed and recorded. Some of the items can be assigned as home work / vacation work.

ANNEXURE - 2

A comprehensive list of skills recommended as desirable for Bachelor of Medicine and Bachelor of Surgery (MBBS) Graduate:

(By Medical Council of India in Regulations on Graduate Medical Education, 1997)

I. Clinical evaluation

a. To be able to take a proper and detailed history.
b. To perform a complete and thorough physical examination and elicit clinical signs.
c. To be able to properly use the Stethoscope, Blood pressure apparatus, Otoscope, Thermometer, Nasal speculurn etc;
d. To be able to perform internal examination—per rectum (PR), per vaginum (PV) dc;
e. To arrive at a proper provisional clinical diagnosis.

II. Bed side diagnostic tests

a. To do and interpret haemoglobin (Hb), total count (TC). erythrocyte sedimentation rate (ESR), blood smear for parasites, urine examination / albumin / sugar / ketones / microscopy;
b. Stool exam for ova and cysts;
c. To do Gram's stain and Ziehl-Neelsen stain for AFB;
d. To do skin smear for lepra bacilli;
e. To do and examine a wet film vaginal smear for Trichomonas.Vaginalis;
f. To do a skin scraping and Potassium hydroxide (KOH) stain for fungal infections:
g. To perform and read Mantoux test.

III. Ability to carry out procedures

a. To conduct CPR (Cardiopulmonary resuscitation) and First aid in newborns, children and adults.
b. To give subcutaneous (SC) / Instramuscular (TM) / Intravenous (IV) injections and start Intravenous (IV) infusions.
c. To pass a nasogastric tube and gixe gastric lavage.
d. To administer oxygen — by mask / catheter.
e. To administer enema.
f. To pass a urinary catheter male and female
g. To insert flatus tube.
h. To do pleural tap, ascitic tap and lumbar puncture.
i. Insert intercostal tube to relieve tension pneurnothorax.
j. To relieve cardiac tamponade.
k. To control external haernorrhage.

1V. Anaesthetic Procedures

a. Administer local anesthesia and nerve block
b. Be able to secure airway patency, administer oxygen by Ambu bag.

V. Surgical Procedure

a. To apply splints, bandages and plaster of Paris (POP) slabs;
b. To do incision and drainage of abscesses;
c. To perform the management and suturing of superficial wounds;
d. To carry our minor surgical procedures, e.g. excision of small cysts and nodules, circumcision, reduction of paraphirnosis, debridement of wounds etc.,
e. To perform vasectomy,
f. To manage anal fissures and give injection for piles.

VI. Obstetric Procedures

a. To perform thorough antenatal examination and identify high risk pregnancies.
b. To conduct normal delivery;
c. To apply low forceps and perform and suture episiotomies;
d. To insert and remove IUD's and to perform tubectomy.

VII. Paediatrics

a. To assess new born and recognize abnormalities and IUG retardation;
b. To perform immunization;
c. To teach infant feeding to mothers;
d. To monitor growth by the use of 'road to health chart' and to recognize development retardation.
e. To assess dehydration and prepare and administer Oral Rehydration Therapy (ORT);
f. To recognize ART clinically;

VIII. ENT Procedures

a. To he able to remove foreign bodies;
b. To perform nasal packing for epistaxis;
c. To perform tracheostomy;

IX Ophthalmic Procedures

a. To invert eyelids;
b. To give subconjunctival injection;
c. To perform epilation of eye-lashes;
d. To measure the refractive error and advise correctional glasses;
e. To perform nasolacrimal duct syringing for patency.

X. Dental Procedures

a. To perform dental extraction

Xl. Community Health

a. To be able to supervise and motivate, community and para-professionals for corporate efforts for the health care;
b. To be able to carry on managerial responsibilities, e.g. Management of stores. indenting, stock keeping and accounting;
c. Planning and management of health camps;
d. Implementation of national health programmes;
e. To effect proper sanitation measures in the community, e.g. disposal of infected garbage, chlorination of dunking water;
f. To identify and institute control measures for epidemics including its proper data collecting and reporting;

I. Forensic medicine including toxicology

a. To be able to carry on proper medico legal examination and documentation of injury and age reports.
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 identify important post-mortem finding in common un-natural deaths.

XIII. Management of emergencies

a. To manage acute anaphylactic shock:
b. To manage peripheral vascular failure and shock;
c. To manage acute pulmonary oedema and LVF:
d. Emergency management of drowning, poisoning and seizures;
e. Emergency management of bronchial asthma and status asthrnaticus;
f. Emergency management of hyperpyrexia;
g. Emergency management of comatose patients regarding airways, positional prevention of aspiration and injuries:
h. Assess and administer emergency management of burns.

Annexure 3

SCHEDULE - I

(See Rule 5)

CATEGORIES OF BlO-MEDICAL WASTE

**Waste Category No.	Waste Category **Type	Treatment & Disposal **Options
Category No.1	Human Anatomical Waste (human tissues, organs, body parts)	Incineration@/deep burial*
Category No.2	Animal Waste (Animal tissues, organs, body parts carcasses, bleeding parts, fluid, blood and experimental animals used in research, waste generated by veterinary hospitals colleges, discharge from hospitals, animal houses)	Incineration@/deep burial*
Category No.3	Microbiology & Biotechnology Waste (wastes from laboratory cultures, stocks or specimens vaccines, human and animal cell culture used in research and infectious agents from research and industrial laboratories, wastes from production of biological, toxins, dishes and devices used for transfer of cultures).	Local autoclaving/micro-waving/ incineration@
Category No.4	Waste sharps (needles, syringes, scalpels, blades, glass, etc., that may cause puncture and cuts. This includes both used and unused sharps)	Disinfection (chemical treatment@@ / auto claving, micro-waving and mutilation, shredding**
Category No 5	Discarded Medicines and Cytotoxic drugs	Incineration/destruction and drugs disposal in secured landfills
(wastes comprising of outdated, contaminated and discarded medicines)		
Category No 6	**Soiled Waste (items contaminated with blood, and body fluids including cotton, dressings, soiled plaster casts, liners, beddings, other material contaminated with blood)	Incineration @/ autoclaving / micro-waving
Category No.7	Solid Waste (wastes generated from disposable items other than the waste **sharps such as tubings, catheters, intravenous sets, etc.)	Disinfection by chemical treatment @@ autoclaving/micro-waving and mutilation/shredding**
Category No.8	Liquid Waste (waste generated from laboratory and washing, cleaning housekeeping and disinfecting activities)	Disinfection by chemical treatment@@ and discharge into drains
Category No 9	Incineration Ash (ash from incineration of any bio-medical waste)	Disposal in municipal landfill
Category No.10	Chemical Waste (chemicals used in production of biologicals, chemicals used in disinfection, as insecticides, etc.)	Chemical treatment@@ and discharge into drains for liquids and secured landfill for solids

@@ Chemicals treatment using at least 1% hypochlorite solution or any other equivalent chemical reagent. ft must be ensured that chemical treatment ensures disinfection.

** Mutilation/shredding must be such so as to prevent unauthorized reuse.

@ There will be no chemical pretreatment before incineration, chlorinated plastics shall not be incinerated.

* Deep burial shall be an option available only in towns with population less than five lakhs and in rural areas.

Colour Coding	**Type of Container**	**Waste Category**	**Treatment options as per Schedule-I**
Yellow	Plastic bag	Cat.1, Cat 2, and Cat.3, Cat 6	Incineration/deep burial.
Red	Disinfected container/plastic bag	Cat.3, Cat.6, Cat.7	Autoclaving/Micro-waving / Chemical Treatment.
Blue/white translucent	Plastic tag/puncture proof container	Cat.4, Cat.7	Autoclaving / micro- waving / Chemical Treatment and destruction / shredding.
Black	Plastic bag.	Cat 5 and Cat 9 and Cat.10 (solid)	Disposal in secured landfill.

*

Notes

1. Colour coding of waste categories with multiple treatment options as defined in Schedule-I, shall be selected depending on treatment option chosen, which shall be as specified in Schedule-I.
2. Waste collection bags for waste types needing incineration shall not be made of chlorinated plastics.
3. Categories 8 and 10 (liquid) do not require containers / bags.
4. Category 3 if disinfected locally need not be put in containers / bags.