IInd MBBS Course and Curriculum

Training Period and Time Distribution of MBBS Course

(1) Every student shall undergo a period of certified study extending over 4 ½ academic years divided into 9 semesters,(i.e. of 6 months each) from the date of commencement of his study for the subjects comprising the medical curriculum to the date of completion of the examination and followed by one year compulsory rotating internship. Each semester will consist of approximately 120 teaching days of 8 hours each college working time, including one hour of lunch.

(2) The period of 4 ½ years is divided into three phases as follows :-

a) Phase-1(two semesters) - 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 somewhat equally divided between Anatomy and Physiology plus Biochemistry combined (Physiology 2/3 & Biochemistry 1/3).

b) Phase-II (3 semesters) - consisting of para-clinical/ clinical subjects.

During this phase teaching of para-clinical and clinical subjects shall be done concurrently. The para-clinical subjects shall consist of Pathology, Pharmacology, Microbiology, Forensic Medicine including Toxicology and part of Community Medicine.

The clinical subjects shall consist of all those detailed below in Phase III.

Out of the time for Para-clinical teaching approximately equal time be allotted to Pathology, Pharmacology, Microbiology and Forensic Medicine and Community Medicine combined (1/3 Forensic Medicine & 2/3 Community Medicine). See Appendix-C.

c) Phase-III (Continuation of study of clinical subjects for seven semesters after passing Phase-I)

The clinical subjects to be taught during Phase II & III are Medicine and its allied specialties, Surgery and its allied specialties, Obstetrics and Gynaecology and Community Medicine.

Besides clinical posting as per schedule mentioned herewith, rest of the teaching hours be divided for didactic lectures, demonstrations, seminars, group discussions etc. in various subjects. The time distribution shall be as per Appendix-C.

The Medicine and its allied specialties training will include General Medicine, Paediatrics, Tuberculosis and Chest, Skin and Sexually Transmitted Diseases, Psychiatry, Radio-diagnosis, Infectious diseases etc. The Surgery and its allied specialties training will include General Surgery, Orthopaedic Surgery including Physio-therapy and Rehabilitation, Ophthalmology, Otorhinolaryngology, Anaesthesia, Dentistry, Radio-therapy etc. The Obstetrics & Gynaecology training will include family medicine, family welfare planning etc.

(3) The first 2 semester (approximately 240 teaching days) shall be occupied in the Phase I (Pre-clinical) subjects and introduction to a broader understanding of the perspectives of medical education leading to delivery of health care. No student shall be permitted to join the Phase II (Para-clinical/clinical) group of subjects until he has passed in all the Phase I (Pre-clinical subjects).

(4) After passing pre-clinical subjects, 1 ½ year (3 semesters) shall be devoted to para-clinical subjects.

Phase II will be devoted to para-clinical & clinical subjects, along with clinical postings. During clinical phase (Phase III) pre-clinical and para-clinical teaching will be integrated into the teaching of clinical subjects where relevant.

(5) Didactic lectures should not exceed one third of the time schedule; two third schedule should include practicals, clinicals or/and group discussions. Learning process should include living experiences, problem oriented approach, case studies and community health care activities.

(6) Universities shall organize admission timings and admission process in such a way that teaching in first semester starts by 1st of August each year.

(7) The supplementary examination for Ist Professional MBBS examination may be conducted within 6 months so that the students who pass can join the main batch and the failed students will have to appear in the subsequent year provided that the students who pass the supplementary examination shall be allowed to appear in the second professional MBBS examination only after he/she completes the full course of study of three semesters (i.e. 18 months) for the second professional MBBS examination irrespective of the examination of the main batch.

8. Phase Distribution and Timing of Examinations:-

6 MONTHS	6 MONTHS	6 MONTHS	
1st Semester	2nd Semester		Ist professional examination (during second semester)
3rd Semester	4th Semester	5th Semester	IInd professional examination (during fifth semester)
6th Semester	7th Semester		IIIrd professional Part I (during 7th semester)
8th Semester	9th Semester		IIIrd professional Part II (Final Professional).

Note:

a) Passing in Ist Professional is compulsory before proceeding to Phase II training.

b) A student who fails in the IInd professional examination, should not be allowed to appear IIIrd Professional Part I examination unless he passes all subjects of IInd Professional examination.

c) Passing in IIIrd Professional (Part I) examination is not compulsory before entering for 8th & 9th semester training, however passing of IIIrd Professional (Part I) is compulsory for being eligible for IIIrd Professional (Part II) examination.

During third to ninth semesters, clinical postings of three hours duration daily as specified in the Table below is suggested for various departments, after Introductory Course in Clinical Methods in Medicine & Surgery of two weeks each for the whole class.

UNIVERSITY EXAMINATIONS :

Theory papers will be prepared by the examiners as prescribed. Nature of questions will be short answer type/objective type and marks for each part indicated separately.

Practicals/clinicals will be conducted in the laboratories or hospital wards. Objective will be assess proficiency in skills, conduct of experiment, interpretation of data and logical conclusion. Clinical cases should preferably include common diseases not esoteric syndromes or rare disorders. Emphasis should be on candidate's capability in eliciting physical signs and their interpretation.

Viva/oral includes evaluation of management approach and handling of emergencies. Candidate's skill in interpretation of common investigative data, xrays, identification of specimens, ECG,etc. also is to be evaluated.

The examinations are to be designed with a view to ascertain whether the candidate has acquired the necessary for knowledge, minimum skills alongwith clear concepts of the fundamentals which are necessary for him to carry out his professional day to day work competently. Evaluation will be carried out on an objective basis.

Question papers should preferably be of short structure/objective type.

Clinical cases/practicals shall take into account common diseases which the student is likely to come in contact in practice. Rare cases/obscure syndromes, long cases of neurology shall not be put for final examination.

During evaluation (both Internal and External) it shall be ascertained if the candidate has acquired the skills as detailed.

There shall be one main examination in a year and a supplementary to be held not later than 6 months after the publication of its results. Universities Examinations shall beheld as under:-

First Professional:-

In the second Semester of Phase 1 training, in the subjects of Anatomy, Physiology and Bio-Chemistry.

Second Professional:-

In the Fifth Semester of Phase II training, in the subjects of Pathology, Microbiology, Pharmacy and Forensic Medicine.

Third Professional :-

Part 1- in the Seventh Semester of Phase III, in the subjects of Ophthamology, Oto-rhyno-laryngology and Community Medicine.

Third Professional :-

Part II-(Final Professional) – At the end of Phase III training in the subjects of Medicine, Surgery, Obstetrics & Gynecology and Pediatrics.

Note :

Results of all university examinations shall be declared before the start of teaching for next semester.

EXAMINATIONS REGULATIONS

ESSENTIALITIES FOR QUALIFYING TO APPEAR IN PROFESSIONAL EXAMINATIONS

The performance in essential components of training are to be assessed, based on:

(1) **Attendance**

75% of attendance in a subject for appearing in the examination is compulsory inclusive of attendance in non lecture teaching. i.e. seminars, group discussions, tutorials, demonstrations, practicals, Hospital (Tertiary, Secondary, Primary) postings and bed side clinics, etc.

(2) **Internal Assessment :**

(i) It shall be based on day to day assessment (see note), evaluation of student assignment, preparation for seminar, clinical case presentation etc.:
(ii) Regular periodical examinations shall be conducted throughout the course. The questions of number of examinations is left to the institution:
(iii) Day to day records should be given importance during internal assessment :
(iv) Weightage for the internal assessment shall be 20% of the total marks in each subject :
(v) Student must 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 of that subject.

Note

Internal assessment shall relate to different ways in which students participation in learning participation in learning process during semesters in evaluated.

Some examples are as follows:

(i) Preparation of subject for students seminar.
(ii) Preparation of a clinical case for discussion.
(iii) Clinical case study/problem solving exercise.
(iv) Participation in Project for health care in the community (planning stage to evaluation).
(v) Proficiency in carrying out a practical or a skill in small research project.
(vi) Multiple choice questions (MCQ) test after completion of a system/teaching.

Each item tested shall be objectively assessed and recorded. Some of the items can be assigned as Home work/Vacation work.

UNIVERSITY EXAMINATIONS :

Theory papers will be prepared by the examiners as prescribed. Nature of questions will be short answer type/objective type and marks for each part indicated separately.

Practicals/clinicals will be conducted in the laboratories or hospital wards. Objective will be assess proficiency in skills, conduct of experiment, interpretation of data and logical conclusion. Clinical cases should preferably include common diseases not esoteric syndromes or rare disorders. Emphasis should be on candidate's capability in eliciting physical signs and their interpretation.

Viva/oral includes evaluation of management approach and handling of emergencies. Candidate's skill in interpretation of common investigative data, x-rays, identification of specimens, ECG,etc. also is to be evaluated.

The examinations are to be designed with a view to ascertain whether the candidate has acquired the necessary for knowledge, minimum skills alongwith clear concepts of the fundamentals which are necessary for him to carry out his professional day to day work competently. Evaluation will be carried out on an objective basis.

Question papers should preferably be of short structure/objective type.

Clinical cases/practicals shall take into account common diseases which the student is likely to come in contact in practice. Rare cases/obscure syndromes, long cases of neurology shall not be put for final examination.

During evaluation (both Internal and External) it shall be ascertained if the candidate has acquired the skills as detailed in Appendex-B.

There shall be one main examination in a year and a supplementary to be held not later than 6 months after the publication of its results. Universities Examinations shall beheld as under:-

First Professional:-

In the second Semester of Phase 1 training, in the subjects of Anatomy, Physiology and Bio-Chemistry.

Second Professional:-

In the Fifth Semester of Phase II training, in the subjects of Pathology, Microbiology, Pharmacy and Forensic Medicine.

Third Professional :-

Part 1- in the Seventh Semester of Phase III, in the subjects of Ophthamology, Oto-rhyno-laryngology and Community Medicine.

Third Professional :-

Part II-(Final Professional) – At the end of Phase III training in the subjects of Medicine, Surgery, Obstetrics & Gynecology and Pediatrics.

Note :

Results of all university examinations shall be declared before the start of teaching for next semester.

2nd MBBS Curriculum

Sr. No	**Subject**	**Final University Examination**				**Internal marks**			**Grand total**
		Theory (T)	Oral (O)	Total (T_1=T+O)	Practical (P)	Theory	Practical	Total (T_2)	T_1+P+T_2
1	Pathology	80	15	95	25	15	15	30	150
2	Microbiology	80	15	95	25	15	15	30	150
3	Pharmacology	80	15	95	25	15	15	30	150
4	Forensic medicine	40	10	50	30	10	10	20	100
	Grand Total								**550**

Pass: In each of the subjects, **a candidate must obtain 50% in aggregate with a minimum of 50% in theory including orals and minimum of 50% in practicals.**

DISTRIBUTION OF MARKS TO VARIOUS DISCIPLINES :

(A) **SECOND PROFESSIONAL EXAMINATION**:(Para-clinical Subjects):-

(a) Pathology:

Theory-Two papers of 40 marks each	
(One applied question of 10 marks in each paper)	80 marks.
Oral (Viva)	15 marks
Practical	25 marks
Internal Assessment	
(Theory-15; Practical-15)	30 marks
Total	**150 marks**

(b) **Microbiology**

Theory-Two papers of 40 marks each	
(One applied question of 10 marks in each paper)	80 marks.
Oral (Viva)	15 marks
Practical	25 marks
Internal Assessment	
(Theory-15; Practical-15)	30 marks
Total	**150 marks**

(c) **Pharmacology** :

Theory-Two papers of 40 marks each	
(One applied question of 10 marks in each paper)	80 marks.
Oral (Viva)	15 marks
Practical	25 marks
Internal Assessment	
(Theory-15; Practical-15)	30 marks
Total	**150 marks**

(d) **Forensic medicine** :

Theory-one papers	
	40 marks.
Oral (Viva)	10 marks
Practical	30 marks
Internal Assessment	
(Theory-10; Practical-10)	20 marks
Total	**100 marks**

Pass: In each of the subjects, **a candidate must obtain 50% in aggregate with a minimum of 50% in Theory including orals and minimum of 50% in Practicals.**

APPOINTMENT OF EXAMINERS:

(1) No person shall be appointed as an examiner in any of the subjects of the Professional examination leading to and including the final Professional examinations for the award of the MBBS degree unless he has taken at least five years previously, a doctorate degree of a recognized university or an equivalent qualification in the particular subject as per recommendation of the Council on teachers' eligibility qualifications and has had at least five years of total teaching experience in the subject concerned in a college affiliated to a recognized university at a faculty position.

(2) There shall be at least four examiners for 100 students, out of whom not less than 50% must be external examiners. Of the four examiners, the senior most internal examiner will act as the Chairman and co-ordinator of the whole examination programme so that uniformity in the matter of assessment of candidates is maintained. Where candidates appearing are more than 100, one additional examiner, for every additional 50 or part thereof candidates appearing, be appointed.

(3) Non medical scientists engaged in the teaching of medical students as whole time teachers, may be appointed examiners in their concerned subjects provided they possess requisite doctorate qualifications and five year teaching experience of medical students after obtaining their postgraduate qualifications. Provided further that the 50% of the examiners (Internal & External) are from the medical qualification stream

(4) External examiners shall not be from the same university and preferably be from outside the state.

(5) The internal examiner in a subject shall not accept external examinership for a college from which external examiner is appointed in his subject.

(6) A university having more than one college shall have separate sets of examiners for each college, with internal examiners from the concerned college.

(7) External examiners shall rotate at an interval of 2 years.

(8) There shall be a Chairman of the Board of paper-setters who shall be an internal examiner and shall moderate the questions.

(9) Except Head of the department of subject concerned in a college/institution, all other with the rank of reader or equivalent and above with requisite qualifications and experience shall be appointed internal examiners by rotation in their subjects; provided that where there are no posts of readers, then an Assistant Professor of 5 years standing as Assistant Professor may be considered for appointment as examiner.

(10) **The grace marks up to a maximum of *five marks* may be awarded at the discretion of the University to a student who has failed only in one subject but has passed in all other subjects. (Note: One subject means theory, practical and/or both)**

Department of Pharmacology
Curriculum

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

OBJECTIVES:

A. KNOWLEDGE :

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

1. Describe the pharmacokinetics and pharmacodynamics of essential and commonly used drugs:
2. List of indications, contraindications, interactions, and adverse reactions of commonly used drugs:
3. Indicate the use of appropriate drug in a particular disease with consideration to its cost efficacy and safety for
    - Individual needs
    - Mass therapy under national health programs.
4. Describe the pharmacokinetic basis, clinical presentations, diagnosis and management of common poisonings.
5. List the drugs of addiction and recommend the management.
6. Classify environmental and occupational pollutants and state the management issues.
7. Indicate causation in prescription of drugs in special medical situations such as pregnancy, lactation, infancy and old age.
8. Integrate the concept of rational drug therapy in clinical pharmacology.
9. State the principles underlying the concept of “Essential Drugs”.
10. Evaluate the ethics and modalities in the development and introduction of new drugs.

B. SKILLS :

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

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

C. INTEGRATION :

Practical knowledge of use of drugs in clinical practice will be acquired throughintegrated teaching with clinical departments and pre-clinical departments.

PHARMACOLOGY SYLLABUS

Theory Syllabus

1. GENERAL PRINCIPLES
   - 1.1. History and definitions of terms in Pharmacology
   - 1.2. Routes of drug administration
   - 1.3. Pharmacokinetics
   - 1.4. Pharmacodynamics
   - 1.5. Principles of therapeutics and factors modifying drug action
   - 1.6. Concepts of essential drugs and rational drug therapy
   - 1.7. Special aspects of drugs in pregnancy, perinatal, pediatric and geriatric pharmacology
   - 1.8. Ethics and modalities of new drug developments
   - 1.9. Adverse reactions to drugs and common drug interactions
   - 1.10. Gene therapy

2. DRUGS ACTING ON AUTONOMIC NERVOUS SYSTEM
   - 2.1. Autonomic nervous system: general consideration and neurohumoral transmission
   - 2.2. Cholinergic and anticholinergic drugs
   - 2.3. Adrenergic and adrenergic blockers
   - 2.4. Drugs acting at autonomic ganglia

3. DRUGS ACTING ON PERIPHERAL (SOMATIC) NERVOUS SYSTEM
   - 3.1. Skeletal muscle relaxants
   - 3.2. Local anesthetics

4. DRUGS ACTING ON CENTRAL NERVOUS SYSTEM
   - 4.1. General anesthetics
   - 4.2. Hypnotic sedatives
   - 4.3. Drugs in the therapy of epilepsies
   - 4.4. Drugs in central nervous system degenerative disorders
   - 4.5. Drugs and treatment of psychiatric disorders – psychosis, anxiety, depression and mania
   - 4.6. Opioid analgesics and antagonists
   - 4.7. Pharmacology of Ethyl and Methyl alcohols
   - 4.8. Drug addiction and treatment

5. THERAPEUTIC GASES

6. AUTACOIDS AND MUSCULOSKELETAL SYSTEM

6.1. Histamine, Bradykinin, 5 HT and their antagonists
6.2. Drugs in the therapy of migraine
6.3. Lipid derived autacoids
6.4. Analgesic – antipyretic and anti-inflammatory agents
6.5. Drug therapy of Rheumatoid Arthritis
6.6. Drug therapy of Gout

7. DRUGS ACTING ON RESPIRATORY SYSTEM
   7.1. Pharmacotherapy of cough
   7.2. Pharmacotherapy of bronchial asthma

8. DIURETICS AND OTHER AGENTS AFFECTING RENAL CONSERVATION OF WATER

9. DRUGS ACTING ON CARDIOVASCULAR SYSTEM
   9.1. Cardiac electrophysiology and drug therapy of Cardiac Arrhythmia
   9.2. Drugs affecting Renin-Angiotensin system and drug therapy of Heart Failure
   9.3. Drug therapy of ischemic heart disease
   9.4. Drugs used in hypertensive disease
   9.5. Lipid lowering drugs
   9.6. Drug Therapy of shock

10. DRUGS AFFECTING BLOOD AND BLOOD FORMATION
    10.1. Hematopoietic agents including growth factors and minerals
    10.2. Anticoagulants, Thrombolytic and antiplatelet drugs

11. DRUGS AFFECTING GASTROINTESTINAL FUNCTION
    11.1. Drug therapy of Peptic Ulcer and Gastro Esophageal Reflux Disease (GERD)
    11.2. Drugs for Emesis and Digestive Disorders
    11.3. Drugs for Constipation and Diarrhea

12. ENDOCRINE PHARMACOLOGY
    12.1. Hypothalamic and pituitary hormones
    12.2. Thyroid and antithyroid drugs
    12.3. Corticosteroids and their antagonists
    12.4. Estrogens, Progestins and their antagonist
    12.5. Contraception
    12.6. Androgens and drug therapy of Erectile Dysfunction
    12.7. Oxytocin and other drugs acting on Uterus
    12.8. Insulin, Drug therapy of Diabetes Mellitus and other Pancreatic hormones
    12.9. Agents that effect bone mineral homeostasis

13. CHEMOTHERAPY AND ANTI-INFECTIVE
    13.1. General consideration of antimicrobial agents
    13.2. Sulfonamides, Cotrimoxazole and Quinolones

13.3. Beta-Lactam antibiotics
13.4. Broad spectrum (Tetracyclines and Chloramphenicol) antibiotics
13.5. Aminoglycoside antibiotics
13.6. Macrolides and other miscellaneous antimicrobials
13.7. Drug therapy of Urinary Tract Infection and Sexually Transmitted Infections
13.8. Drug therapy of Tuberculosis
13.9. Antileprotic Drugs
13.10. Antimalarial Drugs
13.11. Antiamoebic and other Antiprotozoal drugs
13.12. Anthelminthic drugs
13.13. Antifungal drugs
13.14. Antiviral including anti-retroviral drugs
13.15. Antiseptics and disinfectants

14. CANCER CHEMOTHERAPY
14.1. Principles & general consideration
14.2. Treatment approach in some common malignancies

15. VITAMINS

16. TOXICOLOGY
16.1. Principles of toxicology and treatment of poisoning
16.2. Heavy metals and antagonists
16.3. Non-metallic environmental toxicants

17. MISCELLANEOUS
17.1. Dermatological pharmacology
17.2. Ocular pharmacology
17.3. Drugs used for immunomodulation
17.4. Enzymes in therapy
17.5. Vaccines and sera

Practical Syllabus

A. CLINICAL PHARMACY
a. Definition, Sources of Drugs & Drug Development
b. Solid dosage forms
c. Liquid dosage forms
d. Calculation of drug doses and dilutions
e. Clinical pharmacokinetics
f. Sources of Drug Information
g. Communication with the patients

B. EXPERIMENTAL PHARMACOLOGY
a. Introduction to experimental Pharmacology
b. Practical demonstrations by Computer Assisted Learning (CAL)

i. General and local anesthetics
ii. Antiepileptic drugs
iii. Analgesic drugs
iv. Effect of drugs on a rabbit eyes
v. Drugs and autonomic nervous system
vi. Drugs and gastrointestinal track
vii. Drugs and neuromuscular junction
viii. Graphs

C. CLINICAL PHARMACOLOGY
a. Essential Medicines & Concept of Rational Drug Therapy
b. Introduction to Prescription writing
c. Selection of P-Drugs
d. Evaluation of the Fixed-Dose Drug Combinations
e. Critical evaluation of Drug Promotional Literature
f. Adverse Drug Reaction Reporting
g. Prescription writing
i. Central Nervous System
ii. Chemotherapy
iii. Cardiovascular System
iv. Respiratory System
v. Gastrointestinal System
vi. Genitourinary System
vii. Metabolic Disorders and Nutritional Deficiencies
h. Prescription Criticism
i. Statistical exercise- Biological variation

BREAK UP OF TOPICS AND TIME: (300 HOURS)

T-L Method	**Topic**	**Time (hours)**
Lectures	Clinical Pharmacology – core concepts and General Pharmacology as applicable to individual system drugs	16
	ANS	14
	CVS	15
	Blood	6
	Autacoids	5
	Respiratory system	3
	CNS	20
	GIT	6
	Endocrines	13
	Chemotherapy	30

	Skin, eye and ear	1
	Vaccine and sera	1
	Miscellaneous	5
	Total	**135**
Practical	**CAL**	**8**
	Clinical Pharmacy and Pharmacotherapeutics	**100**
Tutorials		**22**
Tests		**35**
Total		**300**

RECOMMENDED TEXT BOOKS:-

1. Essentials of Medical Pharmacology by K. D. Tripathi, 6th Edition.
2. Principles of Pharmacology by H. L. Sharma, K. K. Sharma.
3. Pharmacology and Pharmacotherapeutics by R.S. Satoskar, S.D. Bhandarkar and Nirmala N. Rege , revised 20th Edition.
4. A Complete Textbook of Medical Pharmacology by S. K. Srivastava.
5. M.C.Q. Pharmacology by Dr. K.D. Tripathi.
6. Classification of drugs - K.D. Tripathi.
7. CIMS or MIMS or Drug Index - In a Group of five students

REFERENCE BOOKS:-

1. The Pharmacological Basis of Therapeutics by Goodman and Gillman.
2. Basic and Clinical Pharmacology by Bertram G. Katzung.
3. Pharmacology by H. P. Rang, M. M. Dale, J. M. Ritter, P. K. Morore.
4. Clinical Pharmacology by D.R. Laurence, P. N. Bennett and M. J. Brow

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PHARMACOLOGY EXAMINATION PATTERN

Note: -

1. There will be 2 papers.
2. Time is 2 hours.
3. Paper setter should strict to course content & avoid duplication in different paper & sections.

4. The questions should be set in such a way that it should be completed within time.

5. As far as possible paper setter should write questions legibly in his/her own hand writings & avoid over writings.

6. The blue print of curriculum & section wise break of mark allotted is appended.

DISTRIBUTION OF SYLLABUS FOR THEORY PAPER

PAPER – 1

1. General principles of Pharmacology, drug evaluation and drug interaction.
2. Drugs acting on autonomic nervous system and neuromuscular junction.
3. Drugs acting on C.N.S., local anaesthetics and skeletal muscle relaxants.
4. Autocoids and drug therapy of inflammation.
5. Drug therapy of Rheumatoid arthritis and Gout.
6. Drugs affecting gastrointestinal function.
7. Drugs acting on renal and cardiovascular system.
8. Ocular Pharmacology / Toxicology.

PAPER – 2

1. Drugs used in Endocrine disorder and Hormone Contraceptives.
2. Drugs used in Respiratory diseases.
3. Chemotherapy: Antimicrobial agents and anticancer drugs.
4. Chemotherapy of common infections and parasitic diseases.
5. Drugs acting on uterus.
6. Drugs acting on blood and blood forming organs.
7. Pharmacology of skin
8. Vitamins.

Paper- I **Time: - 2 hrs**

Total 40 marks

Paper	Question No.	Nature of question		Marks
I	1	MCQ		1 x 10=10
	2	Short Notes (Clinical Therapeutics)	(2 out of 3)	2 x 5 = 10
	3	Short Answer	(4 out of 5)	2.5 x 4 = 10
	4	Short Notes	(2 out of 3)	2 x 5 = 10

Paper- II **Time: - 2 hrs**

Total 40 marks

Paper	Question No.	Nature of question		Marks
II	1	MCQ		1x10=10
	2	Short Notes (Clinical Therapeutics)	(2 out of 3)	2 x 5 = 10
	3	Short Answer	(4 out of 5)	2.5 x 4 = 10
	4	Short Notes	(2 out of 3)	2 x 5 = 10

MARKS SCHEME

Theory	
	Marks
Paper- I	40
Paper- II	40
Oral (Viva)	15
Practical	
	Marks
Exercises – 1: Spotting	5
Exercises – 2: Clinical Pharmacy exercises	10
Exercises – 3: Prescription writing + Critical evaluation (Audit) of the Prescription	10

Internal Assessment	
Theory	15
Practical	15

Grand Total – 150

Instructions for MCQ preparation for examiner

1. The stem should be brief and should lead to alternatives (choices)

2. The correct choice should be unambiguous

3. Choices should be numbered as

   (a)

   (b)

   (c)

   (d)

4. Questions should be prepared according to various levels of difficulty

II MBBS – PHARMACOLOGY

Paper – I

Date: Time: Marks: 40

Please Note:

1) Attempt all questions
2) Write legibly and to the point.
3) Q.1 is to be submitted within first 10 minutes.
4) Illustrate the answers wherever necessary

Q.1: MCQ (10)

Note: Encircle the correct answer (Example a. b. c.ⓓ) Please do not tick.

Q. 2 Write short notes on. (Related to Clinical Therapeutics) (Two out of Three). (10)

Q.3 Write briefly on. (Four out of Five) (10)

Q.4 Write short notes on. (Two out of Three). (10)

II MBBS – PHARMACOLOGY

Paper – II

Date: Time: Marks: 40

Please Note:

1) Attempt all questions
2) Write legibly and to the point.
3) Q.1 is to be submitted within first 10 minutes.
4) Illustrate the answers wherever necessary

Q.1 : MCQ (10)

Note: Encircle the correct answer (Example a. b. c. (d)) Please do not tick.

Q.2 Write short notes on. (Related to Clinical Therapeutics) (10)

Q.3 Write briefly on. (Four out of Five) (10)

Q.4 Write short notes on. (Two out of Three). (10)

Eligibility of candidate to appear in the Final University Examination

1. Attendance: The candidate must have attended 75% of total classes held in theory and practical.
2. The candidate must have secured at least 35% of marks in aggregates of internal assessment in theory and practical.

Plan for internal assessment

The time table for internal assessment will be as follows:

Examination Head	Semester/termwise distribution	Examination	Total No. Of Marks	Internal Calculation
Theory	III Semester	First Internal Examination	40	2.5
	IV Semester	Second Internal Examination	40	2.5
	V Semester	Prelim examination	80	5
	Other	Day to day assessment (MCQ, Tutorial etc.)		2.5
	Other	Attendance		2.5
			Total	15
Practical	III semester	First Internal Examination	40	2.5
	IV semester	Second Internal Examination	40	2.5

	V semester	Prelim examination	40	5
	Other	Attendance		2.5
	Other	Journal		2.5
			Total	15

Marking Scheme of internal assessment

Theory 15

Practical 15

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

Head of Department
Department of Pharmacology
GMERS Medical College, Dharpur, Patan (Gujarat)

Curriculum for IInd M.B.B.S.

Pathology

1. Goal

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

2. Educational objectives

(a) Knowledge

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

i. Describe the structure and ultrastructure of a sick cell, the mechanisms of the cell degradation, cell death and repair. Correlate structural and functional alterations in the sick cell.

iii. Explain the Patho physiological processes which governs the maintenance of homeostasis, mechanism of their disturbances and the morphological and clinical manifestation associated with it.

iv. Describe the mechanisms and patterns of tissue response to injury to appreciate the

pathophysiology of disease processes and their clinical manifestations.

v. Correlate the gross and microscopic alterations of different organ systems in common diseases to the extent needed to understand disease processes and their clinical significance.

vi. Develop an understanding of neoplastic change in the body in order to appreciate need for early diagnosis and further management of neoplasia.

vii. Understand mechanisms of common haematological disorders and develop a logical approach in their diagnosis and management.

b) Skills

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

i. Describe the rationale and principles of technical procedures of diagnostic laboratory tests and interpretation of result.

ii. Perform simple bedside tests on blood, urine and other biological fluid samples.

iii. Draw a rational scheme of investigations aimed at diagnosing and managing common disorders.

iv. Understand biochemical/physiological disturbances that occur as a result of disease in collaboration with pre clinical departments.

(c) Integration

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

3. Total duration of teaching 3 Semesters (III, IV and V)

Minimum 315 working days.

Total number of teaching hours allotted to the discipline 325 hrs

Distribution of teaching hours

A) Theory (lectures 110 & tutorials 66) Total 176 hrs.

B) Practicals 118 hrs.

C) Revision & Evaluation (Internal) 31 hrs

4. Syllabus

a. Learning methods

Distribution of teaching hours

DIVISIONS	LECTURES	TUTORIALS	PRACTICALS
DURATION	1 HR	2 HR	2 HR
General Pathology	35	07	17
Haematology	15	04	10

Systemic Pathology	47	13	17
Clinical Pathology	03	04	10
Autopsy	10	5	05
Total	110	33 X2	59 X 2

b. & c. Sequential organization of course contents

The Broad area of study shall be:-

General Pathology (including general neoplasia)

Systemic Pathology (including systemic neoplasia)

Haematology

Clinical Pathology

A) GENERAL PATHOLOGY: (n=35)

1. Definitions and causes of diseases:-

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

2. Modes of cell injury:-

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

3. Necrosis & gangrene:-

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

Desirable to know:- Apoptosis and its relevance.

4. Intracellular accumulations and alterations:-

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

5. Cellular Adaptations/ Growth disturbances:-

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

6. Acute inflammation:-

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

7. Chemical mediators of Inflammation:-

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

8. Chronic inflammation (including granulomatous):-

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

9. Regeneration and repair (general):-

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

10. Repair in specialized tissues:-

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

11. Oedema:-

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

12. Shock:-

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

13. Thrombosis:-

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

14. Embolism and Infarction:-

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

15. Hyperaemia and Haemorrhage:-

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

16. Disturbances of pigment metabolism:-

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

17. Disturbances of Mineral metabolism:-

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

18. Genetic disorders:-

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

19. Hypersensitivity reactions:-

Must know:- Classify, differentiate between different types of hypersensitivity reactions.

Desirable to know:- Be conversant with transplant rejections.

20. Autoimmune diseases:-

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

21. Amyloidosis:-

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

22. AIDS:-

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

23. Typhoid fever:-

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

24. Syphilis:-

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

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

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

28. Leprosy:-

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

29. Fungal diseases:-

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

30. Malaria:-

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

31 & 32. Neoplasia - Nomenclature and classification:-

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

Desirable to know: Precancerous conditions

33. Neoplasia - Carcinogenesis:-

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

34. Neoplasia - Biology and Lab diagnosis:-

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

35. Neoplasia - Spread, grading and staging:-

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

B) HAEMATOLOGY: (n=15)

1. Introduction to haematology and hemopoiesis:-

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

2. Anaemias (general):-

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

3. Iron deficiency anaemia:-

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

4. Megaloblastic anaemia:-

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

5. Haemolytic anaemia:-

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

6. Haemoglobinopathies:-

Must know:- Definition, classification, Lab diagnosis of Thalassaemia and

Sickle cell anaemia.

7&8. Haemorrhagic disorders:-

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

9. Leukocytic disorders:-

Must know:- Leukocytosis, Leukopenia and Leukemoid reactions.

10. Acute Leukaemias:-

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

11. Chronic Leukaemias:-

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

12. Paraproteinemia:-

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

13. Aplastic Anaemias:-

Desirable to know:- Aplastic anaemias and Agranulocytosis.

14. Blood groups:-

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

15. Blood Transfusion:-

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

C) SYSTEMIC PATHOLOGY: (n=46)

1. Atherosclerosis:-

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

2. Hypertension:-

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

3. Other diseases of blood vessels:-

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

4. Ischaemic heart disease:-

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

5. Congenital heart disease:-

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

6. Rheumatic heart disease:-

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

7. Endocardial and pericardial diseases:-

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

8. Cardiomyopathies:-

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

9. Pneumonias:-

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

10. Lung Abscess and Bronchiectasis:-

Must know:- Etiopathogenesis, morphological appearances and complications.

11. Chronic Bronchitis and Emphysema:-

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

12. Occupational lung diseases:-

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

13. Tumours of lung and pleura:-

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

14. Lesions of oral cavity and salivary glands:-

Must know:- Differential diagnosis of swelling of salivary glands, oral cancer

- etiopathogenesis, gross and histopathological descriptions.

15. Gastritis and Peptic Ulcer:-

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

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

16. Ulcers of Intestines:-

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

17. Idiopathic Inflammatory Bowel disease:-

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

18. Tumours of upper GIT:-

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

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

19. Tumours of lower GIT:-

Must know:- Pathology of carcinoma colon.

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

20. Viral Hepatitis:-

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

21. Alcoholic liver disease:-

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

22. Cirrhosis:-

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

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

Must know:- Pathology of Hepatocellular carcinoma.

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

24. Diabetes mellitus:-

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

25. Acute nephritis and rapidly progressive GN:-

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

26. Nephrotic syndrome:-

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

27. Renal failure:-

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

28. Pyelonephritis and interstitial Nephritis:-

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

29. Tumours of kidney and Pelvis:-

Must know:- Classification, Morphological features, clinical course including

Para neoplastic syndromes of common tumours.

30. Tumours of testis and Prostate:-

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

31. Tumours of Cervix and Uterus:-

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

32. Tumours of Ovary and trophoblastic tissue:-

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

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

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

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

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

35. Hodgkin's Lymphoma:-

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

36. Non-Hodgkin's Lymphoma:-

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

Desirable to know:- Extra nodal lymphomas.

37. Tumours of skin - Non-pigmented:-

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

38. Tumours of skin - Pigmented:-

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

39 &40. Soft tissue tumours :-

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

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

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

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

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

44. Inflammatory and neoplastic conditions of CNS:-

Must know:- Morphological features and differential diagnosis of meningitis. Desirable to know:- Classification, morphological features of important CNS tumours, clinical course and sequelae (Meningioma and Gliomas).

45. Lesions of Thyroid:-

Must know:- Differential diagnosis of thyroid nodule.

46. Myopathies:-

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

D) CLINICAL PATHOLOGY : (n=3)

1. Differential diagnosis of Jaundice:-

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

2. Renal function tests:-

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

3. Diabetes mellitus:-

Must know:- Laboratory diagnosis of Diabetes mellitus

E) AUTOPSY : (n=10)

Must know:- Indications and techniques of medical autopsies

Tutorials

GENERAL PATHOLOGY:

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

HAEMATOLOGY:

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

SYSTEMIC PATHOLOGY:

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

CLINICAL PATHOLOGY:

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

AUTOPSY:

CPC of common diseases like

1. Tuberculosis

2. Myocardial infarction

3. Carcinoma/sarcoma

4. Hypertension

5.Leukemia

6. Amyloid

7.Cirrhosis of Liver

8.Meningitis

9.Diabetes Mallitus

10.AIDS /HIV

11.Rheumatic heart disease

12.Nephrotic Syndrome

13.Enteric fever

14. Splenomegaly

15. Congenital Heart disease

d. Term-wise distribution

Term	Topics	Duration in months
I	General Pathology, Hematology & Transfusion Medicine.	6
II	Systemic Pathology &Clinical Pathology	6
III	Tutorials & Revision	6

e. Practicals: Total hours, number & contents

Total hours : 118 Number : 59

Contents :

A) GENERAL PATHOLOGY: (n=17)

1. Introduction to Pathology

2. Introduction to histopathology techniques
3. Methods of staining & study of cells
4. Diagnostic Cytology
5. Cell injury : Reversible
6. Cell injury : Irreversible
7. Cell Injury (Contd)
8. Acute Inflammation - 1
9. Acute Inflammation - 2
10. Acute Inflammation - 3
11. Granulomatous Inflammation : Tuberculousis
12. Granulomatous Inflammation : Syphilis
13. Granulomatous Inflammation : Others
14. Disturbances of Circulation
15. Cellular adaptations
16. Neoplasia : Introduction and Benign Tumours
17. Neoplasia : Malignant Tumours- General & Carcinomas

B) HAEMATOLOGY & TRANSFUSION MEDICINE: (n=10)

1. Collection of Blood
2. Estimation of hemoglobin
3. Blood : RBC Count & Total Leucocyte count
4. Blood : Differential Leucocyte Count
5. Blood : Peripheral Smear Examination
6. Hematological indices and Bone marrow Biopsy
7. Anemia
8. Leukemias
9. Laboratory investigation of haemorrhagic disorders

10. Blood groups and blood transfusion

C) SYSTEMIC PATHOLOGY: (n=17)

1. Neoplasia : Sarcomas & Teratomas
2. Neoplasia : Angiomas , Naevi & Melanomas
3. Neoplasia : Tumours of Breast
4. Neoplasia : Tumours of Bone & Cartilage
5. Neoplasia : Common Tumours of Nervous System
6. Alimentary System
7. Liver
8. Respiratory System
9. Cardiovascular System
10. Non neoplastic lesions of Kidneys
11. Non neoplastic lesions of urinary tract
12. Male genital tract
13. Female genital tract : Uterus & Cervix
14. Female genital tract : Ovary
15. Lesions of lymphnode
16. Lesions of thyroid
17. Recent advances in histopathology

D) CLINICAL PATHOLOGY: (n=5)

1. Urine : Routine examination
2. Urine Special examination and Renal function tests
3. CSF and other body fluids
4. Laboratory investigation in diabetes mellitus
5. Gastric Analysis
6. Liver function tests

7. Pregnancy tests
8. Examination of sputum
9. Examination of feces
10. Recent advances in Clinical Pathology

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

These are grouped under two headings:

The students

1) must see (M)

2) desirable to see (D)

DRAWING SLIDES:

Histopathology:

1. Kidney cloudy change (M)

2. Fatty change liver (M)

3. Uterus - leiomyoma with hyaline change (M)

4. Kidney - amyloid (M)

5. Lymph node - caseous necrosis (M)

6. Kidney - infarct (Coagulation necrosis) (M)

7. Acute ulcerative appendicitis (M)

8. Pyogenic meningitis (M)

9. Lepromatous leprosy - skin (M)

10. Tuberculoid leprosy - skin (M)

11. Actinomycosis (M)

12. Granulation tissue (M)

13. Ileum - typhoid ulcer (M)

14. Tuberculous lymphadenitis (M)

15. Amoebic colitis (M)

16. Lung - haemosiderin pigment or CPC (M)

17. Liver - CPC (M)

18. Artery - recent / organised thrombus (M)

19. Hashimoto's thyroiditis (D)

20. Skin - papilloma (M)

21. Squamous cell carcinoma (M)

22. Adenocarcinoma - Colon (M)

23. Lymph node - metastasis (M)

24. Skin - capillary haemangioma (M)

25. Cavernous haemangioma (M)

26. Benign cystic teratoma (Dermoid cyst) (M)

27. Stomach - chronic peptic ulcer (M)

28. Liver - Viral hepatitis (Massive/ sub-massive necrosis) (D)

29. Liver- portal and biliary cirrhosis (M)

30. Lung - lobar and broncho pneumonia (M)

31. Lung - fibrocaseous tuberculosis (M)

32. Heart - rheumatic myocarditis (D)

33. Heart - healed infarct (M)

34. Aorta - atherosclerosis (M)

35. Kidney - crescentic glomerulonephritis (M)

36. Kidney - chronic glomerulonephritis (M)

37. Kidney - chronic pyelonephritis (M)

38. Kidney - RCC (D)

39. Benign prostatic hyperplasia (M)

40. Testis - seminoma (M)

41. Uterus - leiomyoma (M)

42. Products of conception (M)

43. Hodgkin's lymphoma (M)

44. Brain - tuberculous meningitis (M)

45. Brain - meningioma (D)

46. Bone - osteogenic sarcoma (M)

47. Bone - chondroma (M)

48. Bone - osteoclastoma (M)

49. Skin - melanoma and nevus (M)

50. Breast - fibroadenoma (M)

51. Breast - carcinoma (M)

52. Thyroid - colloid goitre (D)

53. Thyroid - papillary carcinoma (D)

54. Skin - basal cell carcinoma (M)

HAEMATOLOGY:

1. Acute blast cell leukaemia (M)

2. Chronic myeloid leukaemia (M)

3. Eosinophilia (M)

4. Iron deficiency anaemia (M)

5. Haemolytic anaemia (M)

6. Macrocytic anaemia (M)

7. Leucocytosis (M)

8. Various biochemical charts - LFT , GTT , CSF, etc (M)

LIST OF SPECIMEN:

1. Cell injury and adaptation (Degeneration

a) Liver - fatty change (M)

b) Kidney - cloudy change (M)

c) Aorta - atheroma (M)

d) Atheroma with calcification (D)

e) Kidney stones (M)

f) Left Ventricular Hypertrophy

g) Atrophy Uterus

h) Leiomyoma

2. Amyloidosis

a) Kidney - amyloidosis (M)

b) Spleen - amyloidosis (M)

3. Necrosis and Gangrene

a) Kidney - infarct (M)

b) Spleen - infarct (M)

c) Intestine - gangrene (M)

d) Foot - gangrene (M)

e) Lymph node - caseation (M)

4. Acute inflammation

a). Lobar pneumonia (M)

b) Kidney - abscess (D)

c) Liver - abscess (D)

d) Mycetoma - foot (D)

e) Acute appendicitis (M)

f) Purulent meningitis (M)

g) Fibrinous pericarditis (M)

5. Chronic inflammation

a) Syphilitic aortitis (D)

b) Tuberculosis

c) Chronic cholecystitis with gall stones

6. Repair

a) Heart - healed infarct (M)

b) Scar tissue

7. Specific inflammation

a) Ileum - typhoid (M)

b) Amoebic colitis (M)

c) Amoebic liver abscess (M)

8. Chronic specific granulomatous inflammation

a) Intestine - TB ulcer (M)

b) Brain - TB meningitis (M)

c) Lymph node –TB (M)

d) Lung - miliary TB (M)

e) Fibrocaseous TB (M)

9. Pigment disorders

a). Liver and spleen - Prussian blue reaction (D)

b). Liver and spleen - malaria (M)

c). Skin - melanoma (any site) (M)

10. Disorders of vascular flow and shock

a). Liver - CPC (M)

b). Lung - CPC (M)

11. Thrombosis embolism and infarction

a) Thrombus - artery / vein (M)

b) Infarction - kidney / spleen / brain (M)

c) Intestine gangrene (M)

12. Immunopathology

a) Heart - Rheumatic carditis (M)

b) Kidney - acute glomerulo nephritis (M)

c) Thyroid - Hashimoto's thyroiditis (D)

13. Growth disorders

a) Heart - LVH (M)

b) Kidney - atrophy and compensatory hypertrophy (M)

c) Kidney - Hydronephrosis (M)

14. Neoplasm

a) Papilloma skin (M)

b) Adenomatous polyp (M)

c) Fibroadenoma - breast (M)

d) Squamous cell carcinoma - skin (M)

e) Adenocarcinoma - colon (M)

f) Metastasis - lung (M)

g) Leiomyoma - uterus (M)

h) Soft tissue - lipoma (M)

j) Haemangioma - any site / type (M)

k) Melanoma (M)

l) Dermoid cyst (M)

m) Teratoma (M)

15. Alimentary System

a) Oesophagus carcinoma (M)

b) Stomach - chronic peptic ulcer (M)

c) Perforated peptic ulcer (M)

d) Stomach - carcinoma (linitis plastica) (M)

e) Intestine - TB ulcer (M)

f) Colon - Amoebic colitis / bacillary colitis / carcinoma ulcerative / carcinoma polypoidal growth (M)

16. Liver

a) Acute diffuse necrosis (D)

b) Amoebic abscess (M)

c) Micronodular / macronodular / mixed cirrhosis (M)

d) Hepatoma (M)

e) Metastasis (M)

17. Respiratory system

a) Lung - lobar / bronchopneumonia (M)

b) Bronchogenic carcinoma (M)

c) Lung - abscess (D)

d) Fibrocaseous TB (M)

18. Cardiovascular System

a). Rheumatic endocarditis (D)

b) Fibrinous pericarditis (M)

c) Mitral stenosis (M)

d) Aortic stenosis (M)

e) Bacterial endocarditis (M)

f) Recent myocardial infarct (D)

g) Healed myocardial infarct (M)

h) Atheroma aorta (M)

j) Atheroma with complications (M)

19. Urinary System

a) Flea bitten kidney (M)

b) Large white kidney (M)

c) Shrunken granular kidney (M)

d) Acute pyelonephritis (M)

e) RCC (D)

f) Wilm's tumour (D)

g) Papillary carcinoma - Urinary bladder (D)

20. Male Reproductive System

a) SCC - penis (M)

b) Seminoma - testis (M)

c) Teratoma - testis (M)

d) Benign prostatic hyperplasia (M)

21. Female Reproductive System

a) Uterus - leiomyoma (M)

b) Carcinoma cervix (D)

c) Ovary - cyst adenocarcinoma (D)

d) Ovary - dermoid cyst (D)

e) Product of Conception

f) Hydatidiform mole

g) Ectopic Pregnanacy

21. Lymphoreticular System

a) Lymph node - TB Lymphadenitis (M)

b) Lymph node - lymphoma (M)

c) Spleen - infarct (M)

22. Central Nervous System

a) Brain - purulent meningitis (M)

b) Brain - tuberculous meningitis (M)

c) Tuberculoma (D)

d) Meningioma (D)

e) Glioma (D)

f) Haemorrhage - CVA (D)

23. Bone lesions

a) Chronic osteomyelitis (D)

b) Osteoclastoma (M)

c) Osteogenic sarcoma (M)

d) Multiple myeloma (D)

24. Skin lesions

a) Squamous cell carcinoma (M)

b) Basal cell carcinoma (D)

c) Melanoma - skin (any site) (M)

25. Diseases of Endocrine organs

a) Breast - fibroadenoma (M)

b) Breast - carcinoma (M)

c) Thyroid - multinodular goitre (M)

d) Thyroid - solitary nodule / adenoma (M)

f. Books recommended:

a) Text book of Pathology by Robbins

b) Text book of Pathology by Harsh Mohan

c) Haematology by De Gruchi

d) Wheaters Basic Pathology A Text Atlas Review of Histology

e) Practical Pathology by Harsh Mohan

Reference books:

a) Anderson's text book of Pathology Vol I & II

b) Oxford text book of Pathology Vol. I, II & III

c) Pathology by Rubin and Farber

d) Pathologic basis of Disease Robbins

Plan for internal assessment

The time table for internal assessment will be as follows:

Examination Head	Semester/termwise distribution	Examination	Total No. Of Marks	Internal Calculation
Theory	III Semester	First Internal Examination	40	2.5
	IV Semester	Second Internal Examination	40	2.5
	V Semester	Prelim examination	80	5
	Other	Day to day assessment (MCQ, Tutorial etc.)		2.5
	Other	Attendance		2.5
			Total	15
Practicals	III semester	First Internal Examination	40	2.5
	IV semester	Second Internal Examination	40	2.5
	V semester	Prelim examination	40	5
	Other	Attendance		2.5
	Other	Journal		2.5
			Total	15

Marking Scheme of internal assessment

Theory	15
Practical	15

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

Eligibility of candidate to appear in the Final University Examination

1. Attendance: The candidate must have attended 75% of total classes held in theory and practicals.
2. The candidate must have secured at least 35% of marks in aggregates of internal assessment in theory and practicals.

Final University Pathology Examination

MARKS SCHEME

Theory	
	Marks
Paper- I	40 2 hrs
Papeer- II	40 2 hrs
Oral (Viva)	15
Practical	
	Marks
a. 10 Spots 2 minutes each (4 specimen, 1 instrument, 3 histopathology slides, 1 haematology slide and 1 chart) Identification - 1/2 mark, Specific short question - 1/2 mark together 1 mark for each spot	10
b. Urine Examination - Physical and two abnormal constituents	05
c. Histopathology slides : Diagnosis and discussion	03
d. Haematology examination i) Peripheral blood smear stain and report 03	07

ii) Hb/TLC/Blood group	04	

Internal Assessment	
Theory	15
Practical	15

Grand Total – 150

Guidelines for Paper setter

1. There will be 2 papers.
2. Time is 2 hours.
3. Paper setter should strict to course content & avoid duplication in different paper & sections.
4. The questions should be set in such a way that it should be completed within time.
5. As far as possible paper setter should write questions legibly in his/her own hand writings & avoid over writings.
6. The blue print of curriculum & section wise break of mark allotted is appended.

For Examiners

INSTRUCTIONS FOR MCQs

1) The stem should be brief and should lead to alternatives (choices).
2) The correct choice should be unambiguous.
3) Choices should be numbered as

   (a)

   (b)

   (c)

   (d)

4) Question should be prepared according to various levels of difficulty.

PATHOLOGY

Paper- I **Time: - 2 hrs**

Total 40 marks

Paper	Question No.	Nature of question		Marks
I	1	MCQ (4 MCQs from general pathology, 4 from hematology and 2 from transfusion medicine)		10
	2	Short Notes on Applied aspects (From general pathology,hematology)	(2 out of 3)	2 x 5 = 10
	3	Short answer (From hematology and transfusion medicine)	(4 out of 5)	2.5 x 4 = 10
	4	Short notes (From general pathology)	(2 out of 3)	2 x 5 = 10

Topic distribution

Pathology Paper I

- General Pathology incusive of general neoplasia
- Hematology
- Transfusion Medicine

IInd MBBS – PATHOLOGY

Paper – I

Date: **Time:** **Marks: 40**

Please Note:

1) **Attempt all questions.**
2) **Write legibly and to the point.**
3) **Q.1 to be submitted within first 10 minutes.**
4) **Appropriate diagrams will be appreciated.**

Q.1: MCQ (10)

Note: Encircle the correct answer (Example a. b. c.(d.)) Please do not tick.

Q.2 Write short notes on. (Two out of Three). (10)

Q.3 Write briefly on. (Four out of Five) (10)

Q.4 Write short notes on. (Two out of Three). (10)

PATHOLOGY

Paper- II **Time: - 2 hrs**

Total 40 marks

Paper	Question No.	Nature of question		Marks
II	1	MCQ (6 MCQ from systemic pathology and 4 from clinical pathology)		10
	2	Short Notes on Applied aspects (From Systemic Pathology and Clinical Pathology)	(2 out of 3)	2 x 5 = 10
	3	Short answer (Systemic Pathology and Clinical Pathology)	(4 out of 5)	2.5 x 4 = 10
	4	Short notes (From Systemic Pathology)	(2 out of 3)	2 x 5 = 10

Topic distribution

Pathology Paper II

- Systemic Pathology

- Clinical Pathology

IInd MBBS – PATHOLOGY

Paper – II

Date: **Time:** **Marks: 40**

Please Note:

1) **Attempt all questions.**
2) **Write legibly and to the point.**
3) **Q.1 to be submitted within first 10 minutes.**
4) **Appropriate diagrams will be appreciated.**

Q.1 : MCQ (10)

Note: Encircle the correct answer (Example a. b. c.(d.)) Please do not tick.

Q.2 Write short notes on. (Two out of Three). (10)

Q.3 Write briefly on. (Four out of Five) (10)

Q.4 Write short notes on. (Two out of Three). (10)

Hemchandracharya Uttar Gujarat University Curriculum of Microbiology for Undergraduate MBBS course - 2013

1. Goal

The goal of teaching Microbiology is to provide a wide spread knowledge of all the pathogenic organisms, understanding the natural history, pathogenesis, pathogenecity, laboratory diagnosis, treatment, control and prevention of the infectious diseases caused by them and to have a complete knowledge of the immunological system of the human body.

2. Objectives

(a) Knowledge

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

1. Understand the commensal, opportunistic and pathogenic organisms of human body and describe host parasite relationship.
2. Know and describe the pathogenesis of diseases caused by the microorganisms.
3. State the sources and modes of transmission of pathogenic and opportunistic microorganisms including knowledge of insect vectors & their role in transmission of infectious diseases.
4. Choose appropriate laboratory investigations required for clinical diagnosis.
5. Selection of antibiotics for treating the patients according to the antimicrobial susceptibility tests.
6. To know the various National Infectious disease control programmers.
7. Implement prevention & control measures.

(b) Skills

1. Plan and interpret laboratory investigations for diagnosis of infectious diseases and correlate the clinical manifestations with the etiological agent.
2. Identify common infectious agents with the help of laboratory procedures, acquire knowledge of antimicrobial agents, use of antimicrobial sensitivity tests to select suitable antimicrobial agents for treatment.
3. Perform simple laboratory tests, which help to arrive at rapid diagnosis.
4. Be conversant with proper methods of collection, storage & transport of clinical material for microbiological investigations.
5. Understand the principles of immunology and its application in the diagnosis and prevention of infectious diseases including immunization schedule, acquire knowledge of the scope of immunotherapy and different vaccines available for the prevention of communicable diseases.
6. Understand and implement methods of disinfection and sterilization and their application to control and prevent hospital and community acquired infections including universal biosafety precautions and waste disposal.
7. The student should be well equipped with the knowledge of prevalent communicable diseases of national importance and of the newer emerging pathogens.

(C) Attitude

1. The student will be regular, sincere, punctual and courteous.
2. The student will follow all the rules laid down by the department and participate in all activities and keep a record book as prescribed by the department.
3. The student will understand the importance of, and practice asepsis, waste segregation and appropriate disposal.
4. The student will understand the importance of, and practice the best methods to prevent the development of infection in self and patient. (E.g. hand washing, using aprons for hospitals in hospitals only, regularly washing the aprons, wearing gloves (as and when required / handling specimens) etc.).
5. The student will understand the use of different antimicrobial agents including antibiotics and use them judiciously and prevent misuse of drug (prescribing attitude).
6. The student will understand the significance of vaccinations and will receive appropriate vaccines (e.g. TT, Hepatitis B etc.)
7. The student will leave the area allotted for his practical neat and tidy.
8. The student will discard the slides in the appropriate container provided for the same.
9. The student will report any injury sustained in class, immediately.
10. The student will report any breakage occurring during class times immediately.

Sequential organization of contents and their division

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

GENERAL MICROBIOLOGY:

Sr.No.	Lecture Topics	
1	Introduction to Microbiology and history	Definitions: Medical Microbiology, pathology, commensal, etc. contributions of various Scientists in the field of microbiology. History: Scope to cover the importance of Med. Microbiology in diagnosis and prevention of infectious diseases.
2	Morphology of bacteria and bacterial cell	Definitions: prokaryotes, morphology of bacteria, Bacterial cell, cell Walls (differences between Gram positive and Gram negative cell walls), cell membrane, morphological classification, pleomorphism
3	Physiology and growth requirements of bacteria	Nutrition, respiration (anaerobic & aerobic) and growth of Bacteria, growth curve, physical factors influencing growth.
4	Sterilization	Definition of sterilization, disinfection, asepsis, antiseptics, methods of sterilization, factors determining selection of the methods of sterilization. Physical methods of sterilization including principle & their application. Working and efficacy testing of autoclave, inspissator and hot air oven. CSSD, applied aspects of sterilization and Disinfection.
5	Disinfection	Modes of action of chemical agents on microbes. Phenols, Halogens, Aldehydes, Acids, Alcohol, heavy metals, oxidizing agents etc. dyes, soaps and detergents. Concentration and contact time. Fumigation.
6	Biomedical waste disposal	Definition of waste, classification, segregation, transport and Disposal. Universal biosafety precautions.
7	Culture media and culture methods	Culture media: Definition, classification and application Important constituents of culture media.Culture methods: aerobic and anaerobic, different methods of inoculation and their application
8	Identification of Bacteria	Principles of laboratory diagnosis of infectious diseases.
9	Bacterial genetics	Introduction – codon, mutation, transformation, transduction & conjugation, R factor, PCR, DNA probes, genetic engineering.
10	Antibiotic Sensitivity testing	Definitions: antibiotic, bactericidal, bacteriostatic, MIC, MBC, susceptibility. mechanism of action of antimicrobials on bacteria, mechanism of drug resistance and antimicrobial susceptibility tests, steps taken to minimize emergence of resistant strains.
11	Infection, hots parasite and transmission	Commensal, pathogenic and opportunistic organisms, their Pathogenic factors and modes of transmission. Microbial factors: spores, capsule, toxins, enzymes, intracellular

		parasitism, antigenic variation & extrinsic factors etc. leading to establishment of infection. Types of infection: primary, secondary, general, local, natural, nosocomial, iatrogenic, zoonotic.
12	Normal flora	Introduction – various sites, types and role

IMMUNOLOGY:

Sr.No.	**Lecture Topics**	
1	Introduction	Definition of immunity, types of immunity, factors responsible, mechanism of innate immunity, active and Passive immunity, Local immunity. Herd immunity
2	Antigen	Definition, types(Haptens, Heterophile antigens), antigen Determinants, properties of antigen. Determinants of antigenicity. Antigenic specificity, species specificity, isospecificity, autospecificity, super antigens.
3	Antibody	Definition, nature, structure of immuno- Globulins, papain & pepsin digestion, isotypic, allotypic and idiotypic markers, immunoglobulin classes, physical and biological properties of immunoglobins, amino acid sequence, immunoglobin domain, abnormal immunoglobins
4	Antigen-antibody reactions	Definition, characteristics, titre, sensitivity & specificity, antigen- antibody interaction primary, secondary & tertiary, prozone phenomenon, principle, types and application of precipitation, agglutination, complement fixation, enzyme immunoassay, radioimmunoassay, immunofluoroscence test, neutralization and opsonisation. Techniques of precipitation and their uses, blocking antibodies, antiglobulin reactions, co-agglutination, in vitro test, techniques of EIA, IF & electron microscopy.
5	Complement system	Definition, synthesis, pathways, activation, role & biological functions, components, measurement. Regulation of complement activation, complement deficiency.
6	Structure & function of immune system	Primary lymphoid organs, peripheral lymphoid organs, cells of immune system.
7	Immune response	Antibody mediated immune response and Cell mediated immune response
8	Hypersensitivity	Definition, classification, , difference between immediate and delayed reaction, anaphylaxis, atopy, type II & type III reactions, Delayed hypersensitivity and Schwartzman phenomenon
9	Autoimmune diseases	Definition, mechanism, classification, pathogenesis.
10	Transplantation and tumour immunity	Types of transplants, mechanism of transplant rejection, prevention of graft rejection, GVH reaction, IR to tumours, tumour antigens, mechanism of IR to tumours. Type of tumour antigens.

SYSTEMIC BACTERIOLOGY:

Sr.No.	Lecture Topics	
1	Staphylococci	Classification, morphology, culture and isolation, biochemical reactions, resistance, virulence factors, pathogenesis, lab.diagnosis, prevention and control, treatment, MRSA & CONS.
2	Streptococci	Classification, morphology, culture and isolation, biochemical reactions, resistance, virulence factors, pathogenesis, lab.diagnosis, treatment & prophylaxis,Group B Streptococci, Enterococci & Viridans streptococci
3	Pneumococci (Streptococcus pneumonia)	Morphology, culture and isolation, biochemical reactions, resistance, virulence factors, pathogenesis (Pneumonia), lab.diagnosis, treatment & prophylaxis.
4	Neisseria (meningitides & gonorrhea)	Classification, morphology, culture and isolation, biochemical reactions, virulence factors, pathogenesis (meningitis & gonorrhea), lab.diagnosis, treatment, prophylaxis & Non gonococcal urethritis
5	Corynebacterium diptheriae	Classification, morphology, culture and isolation, biochemical reactions, virulence factors, pathogenesis (Diphtheria), lab.diagnosis, treatment & prophylaxis. Diphtheroids
6	Bacillus (anthracis and cereus)	Classification, morphology, culture and isolation, biochemical reactions, virulence factors, pathogenesis (Anthrax), lab.diagnosis, treatment & food poisoning. Bioterrorism. Anthracoid bacilli.
7	Clostridium (Welchii, tetani & botulinum)	Classification, morphology, culture and isolation, biochemical reactions, virulence factors, pathogenesis (Gas gangrene, tetanus, botulism), lab.diagnosis, treatment & prophylaxis
8	Mycobacterium tuberculosis	Classification, morphology, culture and isolation, biochemical reactions, virulence factors, pathogenesis (Tuberculosis), lab.diagnosis including automated Systems, treatment, prophylaxis & RNTCP and DOTS.
9	Atypical mycobacteria	Classification, morphology, culture and isolation, virulence factors, pathogenesis, lab.diagnosis, treatment.
10	Mycobacterium leprae	Classification, morphology, cultivation (Animal models), virulence factors, pathogenesis (Leprosy), lab.diagnosis, treatment.
11	Enterobacteriaceae Introduction, Escherichia coli, Klebsiella and Proteus	Classification, morphology, culture and isolation, biochemical reactions, virulence factors, pathogenesis UTI, diarrhea), lab. diagnosis, treatment.
12	Salmonella	Classification, morphology, culture and isolation, biochemical reactions, virulence factors, pathogenesis (Enteric fever & food poisoning), lab. diagnosis, treatment & prophylaxis.
13	Shigela	Classification, morphology, culture and isolation, biochemical reactions, virulence factors, pathogenesis (bacillary dysentery), lab. diagnosis, treatment.

14	Vibrio	Classification, morphology, culture and isolation, biochemical reactions, virulence factors, pathogenesis (Cholera and food poisoning), lab.diagnosis, treatment & prophylaxis.
15	Pseudomonas	Morphology, culture and isolation, biochemical reactions, virulence factors, pathogenesis, lab.diagnosis, treatment.
16	Spirochetes (treponema, Borrelia & Leptospira)	Classification, morphology, culture and isolation, virulence factors, pathogenesis (Syphilis, Lyme's disease, Relapsing fever, Leptospirosis, Vincent's angina), lab.diagnosis, treatment.
17	Rickettsia	Classification, morphology, cultivation, virulence factors, pathogenesis (Typhus fever, Q-fever), lab.diagnosis, treatment.
18	Chlamydia	Classification, morphology, cultivation, virulence factors, pathogenesis (Trachoma, LGV, psittacosis), lab.diagnosis, treatment.
19	Mycoplasma	Classification, morphology, culture and isolation, virulence factors, pathogenesis (Atypical pneumonia), lab.diagnosis, treatment.
20	Helicobacte& Campylobacter	Classification, morphology, culture and isolation, biochemical reactions, virulence factors, pathogenesis, lab.diagnosis, treatment & prophylaxis
21	Miscellaneous bacteria-Brucella, Listeria, Legionella etc.	Classification, morphology, culture and isolation, biochemical reactions, virulence factors, pathogenesis, lab.diagnosis, treatment & prophylaxis

MYCOLOGY:

SR.NO.	**Lecture Topics**	
1	Introduction to mycology	Definition, differences with bacteria, characteristics of fungi, common terminologies, brief account of types of sporulation and morphological classification of Fungi. Medical & industrial importance of fungi. Mycoses.
2	Lab Diagnosis of fungal diseases	Collection & processing of specimen, methods of isolation and identification.
3	Superficial mycoses	Dermatophytes, non dermatophytes, Candida albicans.
4	Subcutaneous mycoses	Mycetoma, rhinosporidiosis, sporotrichosis, chromoblastomycosis
5	Systemic mycoses	Histoplasmosis, blastomycosis, coccidioidomycosis, paracoccidioidomycosis.
6	Opportunistic mycoses	Candidiasis, cryptococcosis, aspergillosis, pneumocystosis, zygomycosis

VIROLOGY:

SR.NO.	Lecture Topics	
1	General virology	Size, shape, symmetry, structure, resistance, replication, properties and classification of Viruses, pathogenesis, concept of virions.
2	Laboratory diagnosis of viral infections	Collection of samples, transport, cultivation and methods of diagnosis & viral immunity
3	Bacteriophage	Structure, lifecycle & phage typing
4	Pox viruses	Small pox and Molluscum
5	Herpes viruses	Herpes simplex, Varicella Zoster, CMV, EBV
6	Picorna viruses	Polio, Coxsackie, Rhino viruses
7	Orthomyxo viruses	Influenza
8	Paramyxo viruses	Mumps, RSV, Measles
9	Arboviruses	Dengue, Japanese encephalitis, Chikungunya
10	Rhabdo viruses	Rabies
11	Hepatitis viruses	Hepatitis A, Hepatitis B – immunity and lab. Diagnosis
12	Slow viruses	CFD, Kuru
13	Oncogenic viruses	
14	Human Immunodeficiency Virus : AIDS	Structure, pathogenesis, opportunistic infections, lab. Diagnosis & treatment

PARASITOLOGY:

SR.NO.	Lecture Topics	
1	Introduction to medical parasitology	Their nature, classification, and explanation of terminologies, Epidemiology, emerging parasitic infections, pathogenicity and laboratory diagnosis.
2	Entamoeba histolytica	Amoebic infections
3	Free living amoebae and intestinal flagellates	Naegelaria , Acanthamoeba, Giardia & Trichomonas etc.
4	Hemoflagellates	Leishmania donovani: life cycle, morphology, pathogenicity, and lab. Diagnosis etc. Trypanosomes.
5	Malaria	Plasmodium : life cycle, morphology, pathogenicity, laboratory diagnosis etc
6	Misc. Pathogenic protozoa	Toxoplasma, Balantidium coli etc.
7	Cestodes	Taenia saginata & solium, Echinococcus granulosus, Hymenolepis nana - life cycle, morphology, pathogenicity and laboratory diagnosis.
8	Trematodes	Schistosomiasis: life cycle, morphology, pathogenicity & lab diagnosis. Brief account of Fasciola hepatica.
9	Intestinal Nematodes	Ancylostoma duodenale, Ascaris lumbricoides, Enterobius vermicularis, T.trichura. Strongyloides stercoralis, life cycle, morphology, laboratory diagnosis.
10	Tissue	Wuchereria bancrofti, Brugia malayi,Dracunculus medinensis,

	Nematodes	Loa loa, Onchocerca volvulus and others.
11	Hospital acquired infections and control	List of HAI, HAICC, Control measures and BMW disposal Universal work precautions.
12	Opportunistic parasitic infections	Cryptosporidium, Isospora, Microsporum, Strongyloides etc

TUTORIALS (APPLIED MICROBIOLOGY)

Regular tutorials, student seminars & symposia shall be conducted in addition to lectures.
Students must know:

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

List of Tutorial Topics

SR.NO.	Topic
1	Importance of Staining & Microscopy
2	Sterilization & Disinfection
3	Ag-Ab Reactions & Serological Tests
4	Antibiotic Resistance
5	Biomedical Waste Management
6	Blood Culture
7	Hypersensitivity
8	AST
9	Pneumonia
10	Anaerobic infections
11	Tuberculosis
12	Diarrhoeal diseases & Food Poisoning
13	UTI
14	Enteric Fever
15	STD
16	Laboratory Diagnosis of Fungal Infections
17	Septicemia & Endocarditis
18	Hospital Infection control
19	Infection in Critical Care Unit
20	Vaccines & Immunoprophylaxis Schedule Newer Vaccines
21	Hepatitis
22	AIDS
23	PUO and Malaria
24	Recent Advancements in Diagnostic Microbiology. Molecular Techniques & Automated System

Suggested topics for integrated teaching:

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

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

PRACTICALS

SR.NO.	Practicals
1	Introduction , Microscopy
2	Morphology of bacteria
3	Gram staining
4	Ziehl Neelsen staining
5	Sterilization and disinfection
6	Collection and transport of clinical specimens
7	Culture media and methods
8	Identification of bacteria
9	Antibiotic sensitivity testing
10	Serological tests for lab.diagnosis
11	Gram positive cocci
12	Gram negative cocci
13	Gram positive bacilli
14	Tuberculosis & Leprosy
15	Gram negative bacilli
16	Salmonella – lab. diagnosis of enteric fever
17	Shigella – bacillary dysentery
18	Vibrio
19	Pseudomonas
20	Spirochaetes
21	Miscellaneous bacteria
22	Introduction to lab.diagnosis of parasitic diseases
23	23 Stool examination – direct and concentration methods for ova and cysts Peripheral smear – Malaria, Filaria

24	Leishmania, Trypanosoma
25	Toxoplasma, Malaria
26	Cestodes
27	Trematodes
28	Intestinal Nematodes – Enterobius, Trichiuris
29	Tissue Nematodes - Dracanculus

Term wise distribution of theory lectures including practicals:

Term	Topics	Duration in Months
I	General microbiology and Immunology	5
II	Systemic bacteriology and Mycology	6 & 1/2
III	Virology and Parasitology	5

Total Teaching Hours 250 hrs.

Theory 2 hours/week in 1st term.
2 hours/week in 2nd & 3rd term.

Practicals 2 hours/week in 1st term.
2 hours/week in 2nd & 3rd term.

Recommended text books:

1. Texbook of Microbiology - R. Ananthsnarayan & C. K. Jayaram Panikar
2. A Texbook of Microbiology - P. Chakraborty
3. Texbook of Medical Microbiology - Rajesh Bhatia & Itchpujani
4. Texbook of Medical Microbiology - Arora and Arora
5. Texbook of Medical Parasitology - C. K. Jayaram Paniker
6. Texbook of Parasitology - R.P. Karyakarte and Dr. A.S. Damle
7. Texbook of Parasitology - KD Chatterjee

Reference books:

1. Mackie McCartney practical Medical Microbiology- Colle JG , Fraser AG
2. Principles of Bacteriology, Virology & Immunology vol. 1,2,3,4,5- Topley Wilsons
3. Review of Medical Microbiology (Lange)- Jawetz
4. Medical Microbiology- David Greenwood, Richard Stack, John Pentherer
5. Mackie McCartney Medical, Microbiology vol.1- Duguid JP
6. Text book of Medical Microbiology – Jagdish Chander
7. Principles of Internal Medicine (Infectious diseases section) – Harrison

EVALUATION:

Sr.No	Examination	Theory (Marks)	Practical (Marks)
1	I internal	40	40
2	II internal	40	40
3	Preliminary	Paper I – 40 Paper II - 40	40
4	Internal assessment	Out of 15	Out of 15

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

Paper	Questions.No	Nature of Question	Marks
I	1	MCQ	8
	2	Short notes-applied aspects (2 out of 3)	10
	3	Short answer (2 out of 3)	6
	4	Short notes (2 out of 3)	10
	5	Short answer (2 out of 3)	6
II	1	MCQ	8
	2	Short notes-applied aspects (2 out of 3)	10
	3	Short answer (2 out of 3)	6
	4	Short notes (2 out of 3)	10
	5	Short answer (2 out of 3)	6

Topic distribution

A) MICROBIOLOGY PAPER I

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

B) MICROBIOLOGY PAPER II

- Parasitology
- Mycology
- Virology
- Related applied Microbiology.

Marking scheme

Thoery-Two papers of 40 marks each	
(One applied question of 10 marks in each paper)	80 marks
Oral (Viva)	15 marks
Practical	25 marks
Internal assessment	
(Theory-15; Practical-15)	30 marks
Total	150 marks

Nature of practical examination and duration

Practical examination in MICROBIOLOGY will be of 40 marks including oral viva of THREE hours duration.

Curriculum for IInd M.B.B.S.

FORENSIC MEDICINE & TOXICOLOGY

(c) GOAL;

The broad goal of the teaching of undergraduate students in Forensic Medicine is to produce a physician who is well informed about medicolegal responsibilities in practice of medicine. He/She will also be capable of making observations and inferring conclusions by logical deductions to set enquiries on the right track in criminal matters and connected medicolegal problems.

He/She acquires knowledge of law in relation to medical practice, medical negligence and respect for codes of medical ethics.

ii) OBJECTIVES

(c) KNOWLEDGE

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

1. Identify the basic medicolegal aspects of hospital and general practice.

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

3. Appreciate the physician's responsibilities in criminal matters and respect for the codes of medical ethics.

4. Diagnose, manage and identify also legal aspects of common acute and chronic poisonings.

5. Describe the medicolegal aspects and findings of post-mortem examination in case of death due to common unnatural conditions & poisonings.

6. Detect occupational and environmental poisoning, prevention and epidemiology of common poisoning and their legal aspects particularly pertaining to Workmen's Compensation Act.

7. Describe the general principles of analytical toxicology.

b) SKILLS

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

1. Make observations and logical inferences in order to initiate enquiries in criminal matters and medicolegal problems.

2. Diagnose and treat common emergencies in poisoning and manage chronic toxicity.

3. Make observations and interpret findings at 76ost-mortem examination.

4. Observe the principles of medical ethics in the practise of his profession.

(c) INTEGRATION

Department shall provide an integrated approach towards allied disciplines like Pathology, Radiology, Forensic Sciences, Hospital Administration etc. To impart training regarding medicolegal 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.

(d) CURICULUM:

PART (A) : GENERAL

01. History of forensic medicine, definition of forensic medicine and its scope.
02. Legal procedures in India.
03. Personal identification: identification of living and dead. Examination and reconstruction of skeletal remains.
04. Death: definition, its diagnosis and changes after death.
05. Sudden natural death and dowry death.
06. Post-mortem examination – specific reference to its objectives.
07. Mechanical injuries.
08. Firearm injuries.
09. Medico-legal aspects of wound.
10. Regional injuries- special reference to head and chest.
11. Violent asphyxia deaths: drowning and sexual asphyxia.
12. Road traffic accidents.
13. Injuries and deaths from physical agents: burns and scalds, electricity and radiation.
14. Starvation.
15. Medico-legal aspects of sexual functions: virginity, pregnancy, and delivery. Impotence and sterility, artificial insemination, sterilization, sexual offences, abortion, legitimacy, divorce and nullity of marriage.
16. Infanticide.
17. Blood stains and blood groups(its medicolegal aspects), semen.
18. Medicolegal aspects of surgical and anaesthetic practice.
19. Forensic psychiatry: restraint of insane, true and false insanity, criminal and civil responsibilities of inasane.

20. Medical ethics and law: moral principles regulating the medical practice- professional misconduct, professional secracy.

PART (B) : TOXICOLOGY

01. General consideration about toxicology.
02. Corrosive poisons.
03. Metallic irritant poisons: arsenic, lead, thallium, mercury, iron, aluminium, copper.
04. Deliriants: dhatura, cannabis, cocaine.
05. Inebriant poisons: ethyl and methyl alcohol, medicolegal aspects of alcoholism and drunkenness.
06. Snake bite & scorpion bite.
07. Narcotics: opium and its alkaloids (morphine particularly).
08. Drug addiction and drug abuse.
09. Cardiac poisons: digitalis, quinine, nicotine, aconite.
10. Gaseous poisons: carbon monoxide, carbon dioxide, HCN, MIC, H2S gas.
11. Petroleum distillates: kerosene, benzene.
12. Insecticide and weed killer(paraquat).
13. Therapeutic agents: aspirin, paracetamol, insulin, pethidine, barbiturates and tranquilizers.
14. Spinal poisons: strychnine, camphor.

Guidelines for Paper setter

1. There will be 1(one) paper only.
2. Time is 2 hours.
3. Paper setter should strict to course content & avoid duplication in different paper & sections.
4. The questions should be set in such a way that it should be completed within time.
5. As far as possible paper setter should write questions legibly in his/her own hand writings & avoid over writings.
6. The blue print of curriculum & section wise break of mark allotted is appended.

For Examiners

INSTRUCTIONS FOR MCQs

4) The stem should be brief and should lead to alternatives (choices).

5) The correct choice should be unambiguous.

6) Choices should be numbered as

   (a)

   (b)

   (c)

   (d)

4) Question should be prepared according to various levels of difficulty.

FORENSIC MEDICINE

Final University Exam – Theory paper marking

Time: - 2 hrs

Total 40 marks

Question No.	Nature of question		Marks
1	MCQ (4 MCQs from forensic medicine, 2 from toxicology)		06 1 x 6= 6
2	Write in detail (From Forensic Medicine)	(2 out of 3)	2 x 5 = 10
3	Write Short Notes (From Forensic Medicine and Toxiclology)	(3 out of 4)	3 x 4 = 12
4	Write Short notes (From Medical Jurisprudence, Toxicology and Forensic Psychiatry)	(3 out of 4)	3 x 4 = 12

Final University Forensic Medicine Examination

MARKS SCHEME

Theory	
	Marks
Theory-one paper only	40 2 hrs
Oral (Viva)	10
Practical	
a. 05 Spots 2 minutes each (1 specimen, 1 weapon, 1 photograph, 1 X-ray, 1IPC or CrPC and others) Identification - 1/2 mark, Specific short question - 1/2 mark together 1 mark for each spot	05
b. Exercise (Certificate writing of INJURY/AGE/VICTIM & ACCUSED OF RAPE/SODOMY/ILLNESS OR PM WRITING EXRECISES)	**05**
c.Forensic Medicine- Table	**20**
Internal Assessment	
Theory	**10**
Practical	**10**
Grand Total	**100**

IInd MBBS – FORENSIC MEDICINE AND TOXICOLOGY

Date: Time: Total Marks: 40

Please Note:

5) Write legible and to the point. No marks will be given for irrelevant answer.
6) Q.1 to be submitted within first 10 minutes.
7) Unattempted questions will not be marked.
8) Appropriate diagrams will be appreciated.

Q.1 MCQs (06)

Note: Encircle the correct answer (Example a. b. c. (d.)) Please do not tick.
4 MCQs from forensic medicine, 2 from toxicology)

Q.2 Write in detail. (Two out of three). (From Forensic Medicine) (10)

Q.3 Write Short Notes. (Three out of four) (12)

(From Forensic Medicine and Toxicology)

Q.4 Write short notes on. (Three out of four). (12)

(From Medical Jurisprudence, Toxicology and Forensic Psychiatry)

Eligibility of candidate to appear in the Final University Examination

1. Attendance: The candidate must have attended 75% of total classes held in theory and practicals.
2. The candidate must have secured at least 35% of marks in aggregates of internal assessment in theory and practicals.

Plan for internal assessment

The time table for internal assessment will be as follows:

Examination Head	Semester/term wise distribution	Examination	Total No. Of Marks	Internal Calculation
Theory	III Semester	First Internal Examination	20	2
	IV Semester	Second Internal Examination	20	2
	V Semester	Prelim examination	40	4
	Other	Day to day assessment (MCQ, Tutorial, attendance etc.)		2
			Total	10
Practicals	III semester	First Internal Examination	20	2
	IV semester	Second Internal Examination	20	2
	V semester	Prelim examination	40	4
	Other	Attendance, Journal		2
			Total	10

Marking Scheme of internal assessment

Theory 10

Practical 10

Prelim pattern will be as per the University exam with one paper in theory and of 2 hours duration.