SRI LAKSHMI NARAYANA
INSTITUTE OF MEDICAL SCIENCES
(RECOGNIZED BY MEDICAL COUNCIL OF INDIA & AFFLIATED BY BHARATH UNIVERSITY)

REGULATIONS & SYLLABUS

FOR

MBBS COURSE

(THE BACHELOR OF MEDICINE
&
BACHELOR OF SURGERY)

Bharath UNIVERSITY
பாரத் பல்கலைக்கழகம்
BHARATH INSTITUTE OF HIGHER EDUCATION AND RESEARCH
(Declared as Deemed-to-be-University, u/s 3 of the UGC Act, 1956)

BHARATH INSTITUTE OF HIGHER EDUCATION & RESEARCH
(Declared Under Section 3 of UGC Act, 1956)
Chennai 600 044, Tamil Nadu, India

UNDER GRADUATE (M.B.B.S.) COURSE

INDEX

BHARATH UNIVERSITY,

CHENNAI

REGULATONS ON GRADUATE MEDICAL EDUCATION 2012

BACHELOR OF MEDICINE AND BACHELOR OF SURGERY DEGREE COURSE

In exercise of the powers conferred by BHARATH UNIVERSITY, Chennai, the Standing Academic Board hereby makes the following regulations. These regulations framed may be subjected to modification as made by the Standing academic board, then and there.

I. The undergraduate medical education program is designed with a **goal** to create an **"Indian Medical Graduate" (IMG)** possessing requisite knowledge, skills, attitudes, values and responsiveness, so that he or she may function appropriately and effectively as a physician of first contact of the community while being globally relevant.

II. In order to fulfill this goal, the IMG must be able to function in the following **ROLES** appropriately and effectively:

a) **Clinician** who understands and provides preventive, promotive, curative, palliative and holistic care with compassion.

b) **Leader and member of the health care team and system** with capabilities to collect analyze, synthesize and communicate health data appropriately.

c) **Communicator** with patients, families, colleagues and community.

d) **Lifelong learner** committed to continuous improvement of skills and knowledge.

e) **Professional**, who is committed to excellence, is ethical, responsive and accountable to patients, community and profession.

III. **Competencies:** Competency based learning would include designing and implementing medical education curriculum that focuses on the desired and

observable ability in real life situations. In order to effectively fulfill the roles as listed in item 1 above, the Indian Medical Graduate would have obtained the following set of competencies at the time of graduation:

a) Clinician, who understands and provides preventive, promotive, curative, palliative and holistic care with compassion

- Demonstrate knowledge of normal human structure, function and development from a molecular, cellular, biologic, clinical, behavioral and social perspective.
- Demonstrate knowledge of abnormal human structure, function and development from a molecular, cellular, biological, clinical, behavioral and social perspective.
- Demonstrate knowledge of medico-legal, societal, ethical and humanitarian principles that influence health care.
- Demonstrate knowledge of national and regional health care policies including the National Rural Health Mission (NRHM), frameworks, economics and systems that influence health promotion, health care delivery, disease prevention, effectiveness, responsiveness, quality and patient safety.
- Demonstrate ability to elicit and record from the patient, and other relevant sources including relatives and caregivers, a history that is complete and relevant to disease identification, disease prevention and health promotion.
- Demonstrate ability to elicit and record from the patient, and other relevant sources including relatives and caregivers, a history that is contextual to gender, age, vulnerability, social and economic status, patient preferences, beliefs and values.
- Demonstrate ability to perform a physical examination that is complete and relevant to disease identification, disease prevention and health promotion.

- Demonstrate ability to perform a physical examination that is contextual to gender, social and economic status, patient preferences and values.
- Demonstrate effective clinical problem solving, judgment and ability to interpret and integrate available data in order to address patient problems, generate differential diagnoses and develop individualized management plans that include preventive, promotive and therapeutic goals.
- Maintain accurate clear and appropriate record of the patient in conformation with legal and administrative frame works.
- Demonstrate ability to choose the appropriate diagnostic tests and interpret these tests based on scientific validity, cost effectiveness and clinical context.
- Demonstrate ability to prescribe and safely administer appropriate therapies including nutritional interventions, pharmacotherapy and interventions based on the principles of rational drug therapy, scientific validity, evidence and cost that conform to established national and regional health programs and policies for the following:
    - Disease prevention,
    - Health promotion and cure,
    - Pain and distress alleviation, and
    - Rehabilitation and palliation.
- Demonstrate ability to provide a continuum of care at the primary and/or secondary level that addresses chronicity, mental and physical disability.
- Demonstrate ability to appropriately identify and refer patients who may require specialized or advanced tertiary care.
- Demonstrate familiarity with basic, clinical and translational research as it applies to the care of the patient.

b) Leader and member of the health care team and system

- Work effectively and appropriately with colleagues in an inter-professional health care team respecting diversity of roles, responsibilities and competencies of other professionals.
- Recognize and function effectively, responsibly and appropriately as a health care team leader in primary and secondary health care settings.
- Educate and motivate other members of the team and work in a collaborative and collegial fashion that will help to maximize the health care delivery potential of the team.
- Access and utilize components of the health care system and health delivery in a manner that is appropriate, cost effective, fair and in compliance with the national health care priorities and policies, as well as be able to collect, analyze and utilize health data.
- Participate appropriately and effectively in measures that will advance quality of health care and patient safety within the health care system.
- Recognize and advocate health promotion, disease prevention and health care quality improvement through prevention and early recognition: in a) life style diseases and b) cancer, in collaboration with other members of the health care team.

c) Communicator with patients, families, colleagues and community

- Demonstrate ability to communicate adequately, sensitively, effectively and respectfully with patients in a language that the patient understands and in a manner that will improve patient satisfaction and health care outcomes.
- Demonstrate ability to establish professional relationships with patients and families that are positive, understanding, humane, ethical, empathetic, and trustworthy.
- Demonstrate ability to communicate with patients in a manner respectful of patient's preferences, values, prior experience, beliefs, confidentiality and privacy.

- Demonstrate ability to communicate with patients, colleagues and families in a manner that encourages participation and shared decision-making.

d) Lifelong learner committed to continuous improvement of skills and knowledge

- Demonstrate ability to perform an objective self-assessment of knowledge and skills, continue learning, refine existing skills and acquire new skills.
- Demonstrate ability to apply newly gained knowledge or skills to the care of the patient.
- Demonstrate ability to introspect and utilize experiences, to enhance personal and professional growth and learning.
- Demonstrate ability to search (including through electronic means), and critically evaluate the medical literature and apply the information in the care of the patient.
- Be able to identify and select an appropriate career pathway that is professionally rewarding and personally fulfilling.

e) Professional who is committed to excellence, is ethical, responsive and accountable to community and the profession

- Practice selflessness, integrity, responsibility, accountability and respect.
- Respect and maintain professional boundaries between patients, patients colleagues and society.
- Demonstrate ability to recognize and manage ethical and professional conflicts.
- Abide by prescribed ethical and legal codes of conduct and practice.
- Demonstrate a commitment to the growth of the medical profession as a whole.

IV. In order to ensure that training is in alignment with the goals and competencies

a. There shall be a bridge course termed as "Foundation Course" to orient medical students to MBBS program and provide them with requisite knowledge, communication (including electronic), technical and language skills required.
b. The curricula content shall be vertically and horizontally aligned and integrated to the maximum extent possible in order to enhance student interest and eliminate redundancy and overlap.
c. Teaching-learning methods shall be student centric and shall predominantly include small group learning, interactive teaching methods and case based learning.
d. Clinical training shall emphasize early clinical exposure, skill acquisition, certification in essential skills; community/primary/secondary care based learning experiences and emergencies.
e. Training shall primarily focus on preventive and community based approaches to health and disease, with specific emphasis on national health priorities such as family welfare, communicable diseases, epidemics and disaster management.
f. Acquisition and certification of skills shall be through experiences in patient care, diagnostic and skill laboratories.
g. The development of ethical values and overall professional growth as integral part of curriculum shall be emphasized through a structured longitudinal and dedicated program on professional development and ethics.
h. Progress of the medical student shall be documented through structured periodic assessment that includes formative assessment. Logs of skill-based training shall be also maintained.
i. Appropriate faculty development programs shall be conducted regularly by institutions to facilitate medical teachers at all levels to continuously update their professional and teaching skill; and align their teaching skills to curricular objective.

V. ADMISSION TO MBBS COURSE:

1. AGE LIMIT:

He/she shall complete the age of 17 years on or before 31st December of the year of admission to the MBBS Course.

2. ELIGIBILITY CRITERIA:

No Candidate shall be allowed to be admitted to the Medical Curriculum proper of first Bachelor of Medicine and Bachelor of Surgery (MBBS) Course until he/she has passed qualifying examination as under:

a. The higher secondary examination or the Indian School Certificate Examination which is equivalent to 10+2 Higher Secondary Examination after a period of 12 years study, the last two years of study comprising of physics, Chemistry, Biology and Mathematics or any other elective subjects with English at a level not less than the core course for English as prescribed by the National Council for Educational Research and Training after the introduction of the 10+2+3 years educational structure as recommended by the National Committee on education.

   Note: Where the course content is not as prescribed for 10+2 education structure of the National Committee, the candidates will have to undergo a period of one year pre-professional training before admission to the Medical colleges.

Or

b. The Intermediate examination in science of an Indian University/Board or other recognized examining body with Physics, Chemistry and Biology which shall include a practical test in these subjects and also English as a compulsory subject.

Or

c. The pre-professional/pre-medical examination with Physics, Chemistry and Biology, after passing either the higher secondary school

examination, or the pre-university or an equivalent examination. The pre-professional/premedical examination shall include a practical test in Physics, Chemistry & Biology and also English as a compulsory subject.

Or

d. The first year of the three years degree course of a recognized university, with Physics, Chemistry and Biology including a practical Test in these subjects provided the examination is a "University Examination" and candidate has passed 10+2 with English at a level Not less than a core course.

Or

e. B.Sc examination of an Indian University, provided that he/she as passed the B.Sc examination with not less than two of the following subjects Physics, Chemistry, Biology (Botany, Zoology) and further that he/she has passed the earlier qualifying examination with the following subjects - Physics, Chemistry, Biology and English.

Or

f. Any other examination which, in scope and standard is found to be equivalent to the intermediate science examination of an Indian University/Board, taking Physics, Chemistry and Biology including practical test in each of these subjects and English.

3. Procedure for selection to MBBS course shall be as follows :-

a. In case of admission on the basis of qualifying examination under Clause(1) based on merit, candidate for admission to MBBS course must have passed in the subjects of Physics, Chemistry, Biology & English individually and must have obtained a minimum of 50% marks taken together in Physics, Chemistry, and Biology at the qualifying examination as mentioned in Clause(2) of regulation 4. In respect of candidates belonging to Scheduled Castes, Scheduled Tribes or Other

Backward Classes, the marks obtained in Physics, Chemistry and Biology taken together in qualifying examination be 40% instead of 50% as above.

VI. CUT OFF DATE FOR ADMISSION:

Candidate should join the I MBBS Course based on their eligibility for admission on or before 30th September of the calendar year. No candidates shall be admitted after the cut off date prescribed in this regulation.

VII. COMMEMCEMENT OF CLASSES:

The classes for I Year MBBS Course shall start by August I st of each year.

VIII. ATTENDANCE:

a. A Candidate should procure 80% attendance in lecture & Non lecture teaching [seminars, group discussions, tutorials, demonstrations, practicals, Hospital (Tertiary, Secondary, Primary) postings and bed side clinics, etc. in a subject] separately.
b. Attendance of the candidate shall be put up on the Notice Board every 3 months.
c. In subjects that are taught in more than one phase, weightage to attendance for each Phase is considered. E.g. Medicine, assessed in 3rd, 4th years independently.
d. When the candidate is appearing for ***the first time***, he/she should have 80% attendance in all the subjects he/she is appearing for.
e. A failed candidate is allowed to take up university exam in the subsequent examination in the concerned subject in which he/she has 80% attendance.

IX. RE-ADMISSION AFTER BREAK OF STUDY:

a. Candidates having a break of 5 years and above from the date of admission and more than 2 spells of break will not be considered for re-admission.
b. The calculation of the break of study of the candidate for re-admission be taken from the date of first discontinuance of the course.

c. If any candidate discontinued the course due to various reasons and the break of study of the candidate is for more than 6 months, the candidate should get prior permission from the University for continuing the course.

d. Any candidate who does not appear for the examination due to lack of attendance shall be permitted to appear for the examination in the subsequent examination, if the candidate has satisfied the attendance requirements.

e. If the candidate had completed one year and appeared for an examination during the course of study, he/she is exempted from the duration of the course and also be exempted from appearing for the examination, if he/she had passed the subject.

f. The candidates having a break of study of 6 months and above shall apply for readmission in the prescribed form by remitting the stipulated fee for condonation of break of study to the Academic officer of this University. If the period of break of study does not exceed one calendar year the candidates may be re-admitted in the corresponding course of study at the commencement of the session and shall undergo a minimum period of study of 3 months and after fulfillment of the regulations of the University be admitted to the examination. The candidates shall be granted exemption in the subjects they have already passed.

g. If the break of study exceeds one year, the candidates may be permitted to re-join the course at the beginning of the per-clinical (Phase-I) or Clinical (Phase-II), course, as the case may be, with the condition that these candidates will have to undergo the full prescribed period of study in the pre-clinical or clinical course. On re-admission he/she will not be granted any exemption in any subject they have already passed. They shall subscribe to the regulations of this University governing the batch the candidates join, on readmission.

X. INTERNAL ASSESSMENT:

a. It shall be based on day to day assessment (see note), evaluation of student assignment, preparation for seminar, clinical case presentation etc.:

b. A minimum of four written examinations shall be conducted in each subject during an academic year and the average marks of three best performances shall be taken into consideration for the award of internal assessment marks. Assignments completed by candidates may also be considered.

c. A minimum of three practical examinations shall be conducted in each subject during an academic year and an average of two best performances shall be taken into consideration for award of internal assessment marks.

d. A failed candidate in any subject should be provided an opportunity to improve his/her internal assessment marks by conducting a minimum of two examinations in theory and practical separately and average, be considered for improvement.

e. The internal assessment marks (both in written practical/clinical & oral taken together) should be submitted to the University endorsed by the Head of the Institutions fifteen days prior to the commencement of the theory examinations.

f. 100 marks is allotted for Internal Assessment and the distribution will be as follows.

Theory	= 40
Practical	= 40
Record/logbook/Assignment (10)	= 20

g. Student must secure 40% marks (i.e 40) 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.

h. The internal assessment marks must be exhibited periodically on the notice board after completion of the I.A. examination for the knowledge of the students if performance is poor and candidate shows no improvement, parents must be intimated well ahead of the University Examination.

i. Internal assessment shall relate to different ways in which students participate in learning process during semesters is evaluated. Some Examples are.

- Internal Assessment will include Written tests comprising of short notes and creative writing experiences,
- Preparation of subject for students seminar.
- Preparation of a clinical case for discussion.
- Clinical case study/problem solving exercise.
- Participation in Project for health care in the community (planning stage to evaluation).
- Proficiency in carrying out a practical or a skill in small research project.
- Multiple choice questions (MCQ) test after completion of a system/teaching.

XI. TRAINING:

Training Period and Time Distribution

The admission should be organized in such a way that teaching in first semester starts by August 1 of each year.

a. Every student shall undergo a period of certified study extending over 4½ 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 examination and followed by one year Compulsory Rotating Internship. Each semester shall consist of approximately 120 teaching days of 8 hours each college working time, including one hour of lunch. The nomenclature of semester system shall be uniformly followed in place of years as they are nomenclature now.

b. The period of 4½ years is divided into three phases as follows:-

Phase Distribution and Timing of Examinations:

Phase	Semesters	Examination
Phase I	Semesters I and II	I MBBS
Phase II	Semesters III, IV, and V	II MBBS
Phase III	Semesters VI, and VII	III MBBS Part I
	Semesters VIII and IX	III MBBS Part II

TIME DISTRIBUTION OF MBBS PROGRAMME

The nine semesters of six months each are distributed to the three phases as detailed below.

<table>
<tr><th>YEAR OF STUDY</th><th>JAN</th><th>FEB</th><th>MAR</th><th>APR</th><th>MAY</th><th>JUN</th><th>JUL</th><th>AUG</th><th>SEP</th><th>OCT</th><th>NOV</th><th>DEC</th></tr>
<tr><td>I YEAR</td><td colspan="7"></td><td>I MBBS & ADMISSION</td><td colspan="4">I YEAR ONE YEAR</td></tr>
<tr><td></td><td>I MBBS</td><td colspan="6"></td><td>I YEAR EXAM</td><td></td><td>II MBBS</td><td></td></tr>
<tr><td></td><td colspan="12">II MBBS</td></tr>
<tr><td>III YEAR PART I</td><td></td><td>II YEAR EXAM</td><td>III YEAR PART I</td><td colspan="9"></td></tr>
<tr><td rowspan="2">III YEAR PART II</td><td></td><td>III YEAR PART I EXAM</td><td></td><td>III YEAR PART II</td><td colspan="8"></td></tr>
<tr><td>III YEAR PART II EXAM</td><td colspan="11">INTERNSHIP</td></tr>
</table>

1) **Phase I** (two semesters of six months each totaling approximately 240 teaching days) -consisting of Pre-clinical subjects - Human Anatomy, Physiology including Bio-physics, Bio-chemistry and Introduction to Community Medicine including Humanities. Half the time available is allotted for Anatomy. Of the remaining half, two third time will be for Physiology and one third for Biochemistry. Basic knowledge of Anatomy, Physiology and Biochemistry of the human body should be transmitted to the students, giving a proper exposure to clinical studies to be undertaken later. Newer modalities of investigation like ultrasound, CT scan, contrast x-ray, NMR etc. should be introduced to the students. Anatomy dissection should be reoriented to suit the objectives of the new regulation. Rather than letting the students do their own dissection and consequently wasting precious time, the teachers should organize dissected specimens and teach the students more of clinical anatomy, stressing on surgical importance. The reduction in the course of I MBBS has reduced the burden of teaching of preclinical subjects (there being only one batch at a time). The time made available should be utilized for simplifying the learning process of the students, suiting to the new pattern of examination in Anatomy, which does not envisage dissection. Apart from didactic lectures Seminars are to be arranged for the benefit of the students to simplify the process of learning. They should be organized by departments incorporating vertical & horizontal integration with the participation of preclinical, paraclinical and clinical teachers.

   - **Students will work for 7 hours a day - 8.00 am. to 4.00 pm. One hour lunch break will be given.**
   - Teaching in semester I will commence on 1st of August of each year.
   - No student shall be permitted to join the Phase II (Para-clinical/clinical) group of subjects until he/she has passed in all the Phase I (Pre-clinical) subjects for which he/she will be permitted not more than four chances (actual examination), provided four chances are completed in three years from the date of enrollment. Additional batch of students will have separate postings.
   - Partial attendance in an exam in any subjects shall be counted as an attempt.

- Teaching methods: Students are to be encouraged in self learning. Methods in which students are actively involved should be introduced. Only one third of the available time should be used for lectures. The rest is to be used for discussions, seminars, practical demonstrations and problem based learning, tutorials, (Non – lecture) etc.
- Integrated teaching is emphasized - Integration should be between preclinical departments (horizontal integration) and with clinical departments (vertical integration).
- More stress is to be laid on basic principles of the subjects, with more emphasis on applied aspects.

2) **Phase II**. After passing the pre-clinical subjects, 1½ years (3 semesters) shall be devoted to para-clinical / clinical subjects, along with clinical posting. 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. The clinical postings will have clinical lectures from 8.00 to 9.00 a.m. from the third to the ninth semesters. Out of the time for Para-clinical teaching approximately equal time should be allotted to Pathology, Pharmacology, Microbiology and Forensic Medicine and Community Medicine combined (1/3 Forensic Medicine and 2/3 Community Medicine).

3) **Phase III** (Continuation of study of clinical subjects for seven semesters after passing Phase I). The clinical subjects to be taught during Phase II and Phase III are Medicine and its allied specialties, Surgery and its allied specialties, Obstetrics and Gynecology and Community Medicine. During phase III, pre-clinical and para-clinical teaching will be integrated into the teaching of clinical subjects where relevant. 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 Table. Training in Medicine and its allied specialties will include General Medicine, Pediatrics, Tuberculosis and Chest, Skin and Sexually Transmitted Diseases, Psychiatry, Radio-diagnosis, Infectious diseases etc.

Training in Surgery and its allied specialties will include General Surgery, Orthopedic Surgery including Physiotherapy and Rehabilitation, Ophthalmology, Otorhinolaryngology, Anaesthesia, Dentistry, Radio-therapy etc. The Obstetrics & Gynecology Training in will include family medicine, family welfare planning etc. Teaching of para-clinical subjects shall be 3 hrs. per day in semesters III,IV and V (see attached Time Table). The Total number of hours will not include University examinations, but will include internal assessment examinations and revision classes.

PHASE WISE DISTRIBUTION OF SUBJECTS

PHASE & YEAR OF MBBS TRAINING	SUBJECTS & NEW TEACHING ELEMENTS	DURATION	UNIVERSITY EXAMINATION
Phase 1 I MBBS	Foundation Course Professional Development including Ethics, Anatomy, Physiology, Biochemistry & Community Medicine.	1 Year (August – next year August)	I MBBS
Phase 2 II MBBS	Pathology, Microbiology and Pharmacology, Forensic Medicine and Toxicology Introduction to clinical subjects Professional Development including Ethics.	1½ Year October – next October & in the following February	II MBBS
Phase 3 III MBBS PART 1	Oto-rhinolaryngology, Ophthalmology, Community Medicine.	1 year March to February	III MBBS (Part 1)
Phase 3 III MBBS PART 2	Medicine, Surgery, Obstetrics and Gynecology and Pediatrics and Specialties.	1 year March to January end	III MBBS (Part 2)

Prescribed Teaching Hours.

Following minimum hours are prescribed in various disciplines:

TEACHING HOURS: Phase – I

SUBJECTS	LECTURES	NON LECTURES (SMALLGROUP/TEACHING/TUTORIALS/ SEMINAR/SYMPOSIM/ASSIGNMENT/ INTEGRATED LEARNING/PRACTICAL/CLINICAL)	TOTAL
Anatomy	217	433	650
Physiology	160	32	480
Biochemistry	80	160	240
Community Medicine	20	40	60
		TOTAL:	**1430**

TEACHING HOURS: Phase – II

SUBJECTS	LECTURES	NON LECTURES (SMALLGROUP/TEACHING/TUTORIALS/ SEMINAR/SYMPOSIM/ASSIGNMENT/ INTEGRATED LEARNING/PRACTICAL/CLINICAL)	TOTAL
Pathology	100	200	300
Pharmacology	100	200	300
Microbiology	83	167	250
Community Medicine	30	60	90
Forensic Medicine	33	67	100
		TOTAL:	**1040**

TEACHING HOURS – FROM 3RD SEMESTER ONWARDS

SUBJECTS	LECTURES	NON LECTURES (SMALLGROUP/TEACHING/TUTORIALS/ SEMINAR/SYMPOSIM/ASSIGNMENT/ INTEGRATED LEARNING/PRACTICAL/CLINICAL)	TOTAL
General Medicine	100	200	300
General Surgery	100	200	300
Obstetrics and Gynecology	100	200	300
Pediatrics	33	67	100
Orthopedics	33	67	100
Community Medicine	33	73	106
Dermatology	10	20	30
Psychiatry	7	13	20
Pulmonary Medicine	7	13	20
Oto-rhinolaryngology	23	47	70
Ophthalmology	33	67	100
Radiology and Radiotherapy	7	13	20
Anesthesiology	7	13	20
Dentistry	3	7	10
		Total:	**1496**

CLINICAL SUBJECTS (Phase II and III - Semesters III to IX)

Clinical posting of three hours duration daily (inclusive of one hour of clinical lecture) in the different Departments will be held as per scheduled below. All semesters cannot be considered as equal because of the occurrence of examinations in the Semesters II, V, VII and IX. Since the results of the examinations of I MBBS and Final MBBS part II have to be published before the end of the semester, the University examinations will have to start on the beginning of the 5th month of the concerned semester. The final average examination which has to be conducted in the pattern of the University examination will take one month in an institution with an annual intake of 200 students. So the teaching has to be completed by the end of the 3rd month of Semester II and Semester IX. The posting will have to end by

the end of the fourth month of Semester V and Semester VII. So Semesters I, III, IV, VI and VIII can have full complement of six months of postings. Revision classes will he held during the month set for final internal assessment in Semesters II, V, VII and IX. During Semesters III to IX, following clinical posting for each student of 4 hrs. duration is decided for various departments.

CLINICAL POSTING IN VARIOUS DEPARTMENTS:

SUBJECTS	3RD SEMESTER (Wks)	4TH SEMESTER (Wks)	5TH SEMESTER (Wks)	6TH SEMESTER (Wks)	7TH SEMESTER (Wks)	8TH SEMESTER (Wks)	9TH SEMESTER (Wks)	TOTAL (Wks)
General * * * Medicine	6	-	4	-	4	6	6	26
Pediatrics	-	2	-	2	2	4	-	10
T.B. & Chest Diseases	-	2	-	-	-	-	-	02
Skin & STD	-	2	-	2	-	2		06
Psychiatry	-	-	2	-	-	-	-	02
Radiology *	-	-	-	-	2	-	-	02
General * * * * Surgery	6	-	4	-	4	6	6	26
Orthopaedics * *	-	-	4	4	-	-	2	10
Ophthalmology	-	4	-	4	-	-	2	10
Ear Nose and Throat	-	4	-	4				08

SUBJECTS	3RD SEMESTER (Wks)	4TH SEMESTER (Wks)	5TH SEMESTER (Wks)	6TH SEMESTER (Wks)	7TH SEMESTER (Wks)	8TH SEMESTER (Wks)	9TH SEMESTER (Wks)	TOTAL (Wks)
Obstetrics and Gynecology * * * * * including Family Welfare Planning	2	4	4	-	4	4	6	24
Community Medicine	4	4	-	4	-	-	-	12
Casualty	-	-	-	2	-	-	-	02
Dentistry	-	-	-	-	2	-	-	02
Total (in weeks)	18	22	18	22	18	22	22	142

- Clinical methods in Medicine and Surgery for whole class will be for 2 weeks each respectively at the start of 3rd semester

* This posting includes training in Radio diagnosis and Radiotherapy where in existence.

* * This posting includes exposure to Rehabilitation and Physiotherapy.

* * * This posting includes exposure to laboratory medicine and infectious diseases.

* * * * This posting includes exposure to dressing and Anesthesia.

* * * * * This includes maternity training and Family medicine and the 3rd semester Posting shall be in Family Welfare Planning.

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

Vertical integration in teaching of clinical subjects is done including Preclinical & Para clinical staff. Seminars to be arranged for the benefit of students to simplify learning. Seminars should be integrated vertically with participation of preclinical & para clinical teachers.

XII. TIME TABLE FOR LECTURES/ PRACTICALS:

SEMESTERS I & II

DAYS	8.00 am -10.00 am	10.00 am – 11.00 am	11.00am - 12.00pm	12 – 1 p.m.	1 - 2 p.m.	2 - 4 p.m.
Monday	ANATOMY DISSECTION	Physiology(L)	Anatomy (L)	LUNCH	Community medicine (L)	Biochemistry/ Physiology (Pract)
Tuesday		Anatomy (L)	Biochemistry (L)		Community medicine (L)	Biochemistry/ Physiology (Pract
Wednesday		ANATOMY HISTOLOGY			Physiology(L)	Physiology(Lect)
Thursday		Anatomy (L)	Physiology(L)		Physiology(L)	Physiology/ Biochemistry Tutorials
Friday		Biochemistry (L)	Anatomy (L)		Physiology(L)	Physiology/ Biochemistry Tutorials
Saturday		Anatomy (L)	Biochemistry (L)		Physiology(L)	Physiology(Lect)

SEMESTER III & IV

DAYS	8.00 am - 11.00 noon	11.00 am – 12.00 am	12 – 1 p.m.	1 - 2 p.m.	2 - 3 p.m.	3 -4 p.m.
Monday	CLINICAL POSTINGS	Pharmacology (L)	LUNCH	Microbiology (L)	Pathology (L)	Path/Micro (P)
Tuesday		General Medicine (L)		F.M. (L)	Microbiology (L)	Path/Micro (P)
Wednesday		Pathology (L)		Pharmacology (L)	F.M. / Pharmacology (P)	
Thursday		General Surgery (L)		Pharmacology (L)	Pathology (L)	Microbiology (L)
Friday		Pathology (L)		General Surgery (L)	Community medicine (L)	Pharmacology (L)
Saturday	C.E.P. *	OB&G (L)		General Medicine (L)	TEST	

* C.E.P. Continuous Evaluation Process.

V SEMESTER

DAYS	8.00 am - 11.00 noon	11.00 am – 12.00 pm	12 – 1 p.m.	1 - 2 p.m.	2 - 3 p.m.	3 -4 p.m.
Monday	CLINICAL POSTINGS	General Medicine (L)	LUNCH	General Surgery (L)	General Medicine (L)	Pathology (L)
Tuesday		General Surgery (L)		Microbiology (L)	Pathology (L)	Pharmacology (L)
Wednesday		OB&G (L)		Microbiology (L)	Pathology (L)	Micro/Path (P)
Thursday		Community medicine(L)		F.M. (L)	Pharmacology (L)	Micro/Path (P)
Friday		OB&G (L)		Microbiology (L)	F.M./ Pharmacology (P)	
Saturday	C.E.P. *	Community medicine (L)		Pharmacology (L)	TEST	

VI SEMESTER

DAYS	8.00 am -12.00 noon	12 – 1 p.m.	1 - 2 p.m.	2 - 3 p.m.	3 - 4 p.m.
Monday	CLINICAL POSTINGS	LUNCH	General Surgery	Ophthalmology	Orthopedics
Tuesday			Ophthalmology	T.B. & Chest	Community medicine
Wednesday			General Medicine	OB&G	ENT
Thursday			General Surgery	Community medicine	
Friday			ENT	General Medicine (L)	Pediatrics
Saturday	C.E.P. *		OB&G	Anesthesiology	Radiology

VII SEMESTER

DAYS	8.00 am -12.00 noon	12 – 1 p.m.	1 - 2 p.m.	2 - 3 p.m.	3 - 4 p.m.
Monday	CLINICAL POSTINGS	LUNCH	General Surgery	Ophthalmology	Orthopedics
Tuesday			Ophthalmology	Ophthalmology	Community medicine
Wednesday			General Medicine	OB&G	ENT
Thursday			General Surgery	Community medicine	
Friday			ENT	General Medicine	Pediatrics
Saturday	C.E.P. *		OB&G	I wk. – TB & Chest III wk. - Anesthesiology IV wk. - Radiology	I wk. – Dentistry. III & IV wk. – Psychiatry.

VIII & IX SEMESTER

DAYS	8.00 am -12.00 noon	12 – 1 p.m.	1 - 2 p.m.	2 - 3 p.m.	3 - 4 p.m.
Monday	CLINICAL POSTINGS	LUNCH	OB&G	Pediatrics	General Medicine
Tuesday			General Medicine	General Surgery	SKIN & STD
Wednesday			Orthopedics	Pediatrics	OB&G
Thursday			General Medicine	OB&G	General Surgery
Friday			OB&G	Orthopedics	Psychiatry
Saturday	C.E.P. *		General Surgery	INTERNAL ASSESSMENT TEST	

XIII. UNIVERSITY EXAMINATION:

1. **NO OF ATTEMPTS:**

   A student shall not be allowed to graduate later than 9 years of joining the first MBBS Course. Not more than 4 (Four) attempts shall be allowed for a candidate to pass the first MBBS Examination and total period of completion of the first MBBS course shall not exceed 4 (Four) years.

2. **CARRYING OVER OF FAILED SUBJECTS**:

   University examinations are to be designed with a view to ascertain whether the candidate has acquired the necessary knowledge, minimum skills, ethical and professional values with clear concepts of the fundamentals which are necessary for him/her to function effectively and appropriately as a physician of first contact. Assessment shall be carried out on an objective basis to the extent possible.

   PHASE: I

   The University Examination will be held at the end of 1 academic year. Passing the phase I subjects is compulsory before proceeding to phase II training.

   PHASE: II

   The university Examination will be held at the end of 1½ years after joining Phase II. A student who fails in the phase II subjects will not be allowed to appear for phase III Part I examination unless he passes all the subjects of phase II. But however he/she is allowed to take up the training in III Phase Part I subjects.

   PHASE III:- PART I

   University examination will be held at the end of one year after joining Phase III. The candidate should have cleared all the Phase II subjects before appearing for III year Part I University Examination.

PHASE III:- PART II

University Examination will be held at the end of one year. The candidate should have cleared the III year Part I subjects in order to be eligible to take up the (III year Part II) final Examination.

There shall be one main examination in a year and a supplementary to be held not earlier than 3 months or later than 6 months after publication of its results.

CRITERIA FOR A PASS:

Candidate should have passed both in Theory and Practical Examinations separately. If a candidate fails in theory and passes in practical he/she has to appear in the subsequent exam both theory and practical and vice versa.

The Pattern of Question Paper & Mark Distribution will be as follows.

There will be 2 sections in each paper. Each paper will have 20 MCQ Questions carrying 1 Marks each. Each section will contain 1 applied question of 10 marks & 6 short answers question each carrying 5 marks.

PRACTICALS:-

Practical/clinical examinations will be conducted in the laboratories or hospital wards. The objective will be to assess proficiency and skill to conduct experiments, interpret data and form logical conclusion. Clinical cases kept in the examination must be common conditions that the student may encounter as a physician of first contact in the community. Rare syndromes and disorders are to be discouraged. Emphasis should be on candidate's capability in elicit a history, demonstrate physical signs, write a case record, analyze the case and develop a management plan.

Viva/oral includes assessment of management approach and handling of emergencies, ethical and professional values. Candidate's skill in interpretation of common investigative data, x-rays, identification of specimens, ECG, etc. also are to be assessed.

QUESTION PAPER PATTERN:

MCQ	=	20 (20 X 1)
APPLIED QUESTIONS	=	20 (2 X 10)
SHORT ANSWERS	=	60 (12 X 5)
		TOTAL: 100

MCQ	= 20
SECTION A	= 40
SECTION B	= 40
	TOTAL: 100

MARK

SECTION A – APPLIED QUESTION = 1 X 10 = 10
SHORT ANSWERS = 6 X 5 = 30
TOTAL: 40

MARK

SECTION B – APPLIED QUESTION = 1 X 10 = 10
SHORT ANSWERS = 6 X 5 = 30
TOTAL: 40

THEORY	**MARKS**
2 PAPERS	200
1 PAPER	100

PASS CRITERIA:

THEORY	**MAXIMUM**	**MINIMUM**
2 Papers	200	100
Practical	80	40
Viva	20	-
Practical + Viva	100	50
Internal Assessment	100	40
GRAND TOTAL:	**400**	**200**

PASS CRITERIA:

THEORY	MAXIMUM	MINIMUM
1 Paper	100	50
Practical	80	40
Viva	20	-
Practical + Viva	100	50
Internal Assessment	100	40
GRAND TOTAL:	**300**	**150**

XIV. CLASSIFICATION OF SUCCESSFUL CANDIDATES:

a) A successful candidate securing 75% or above of the marks in the aggregate in any subject in the first appearance will be declared to have passed the examination in that subject with distinction.

b) First class may be awarded to such candidates who have passed all the subjects at the first appearance and obtained 60% of marks and above in the aggregate of all the subjects he/she had appeared in the particular phase of the MBBS Course.

c) Candidates who have passed all the subjects at the first appearance and obtained 75% of marks and above in all the subjects he/she had appeared shall be awarded first class distinction.

d) All other successful candidates shall be declared to have passed in second class.

XV. RE TOTALLING:

Re totalling of theory paper shall be done if a candidate fails in any subject/subjects .For each subject the candidate has to remit a sum of Rs.1000/- to the University, along with the application duly endorsed by the HOD.

XVI. REGULATIONS FOR CONDONATION OF LACK OF ATTENDANCE:

Condonation of shortage of attendance upto a minimum of 5% in the prescribed minimum attendance for admission to an examination vests with the discretionary power of the Vice – Chancellor. A candidate lacking in attendance should submit an

application in the prescribed form and remit the stipulated fee 15 days prior to the commencement of the theory examination. The Head of the Department and Head of the Institution should satisfy themselves on the reasonableness of the candidates request while forwarding the application with their endorsement to the Controller of the Examination. No application would be considered if it is not forwarded through proper channel.

Condonation for lack of attendance shall be taken up for consideration under the following circumstances.

a) Any illness afflicting the candidate. (The candidate should submit through the Head of the Institution a Medical Certificate from a registered medical Practioner soon after he returns to the Institution after treatment). Any candidate going on leave on medical grounds should report to the university as well as to the College immediately within 3 weeks for record.

b) Any unforeseen tragedy in the family, (The parent/guardian should give in writing the reason for ward's absence to the Head of the Institution).

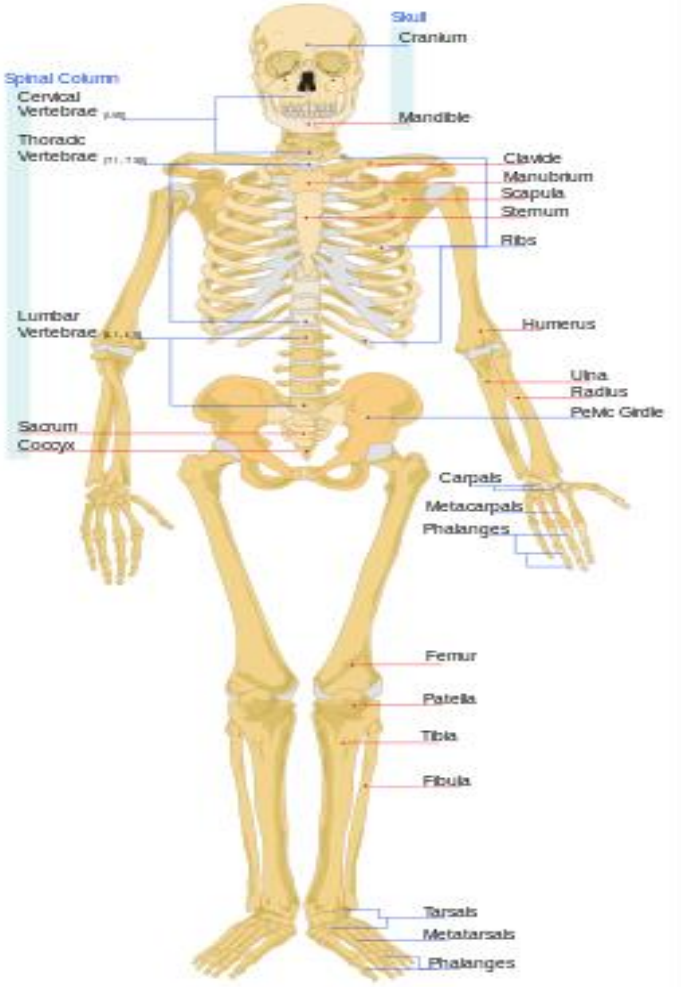
c) Participation in NCC/NSS and other co-curricular activities representing the Institution or University. (The Head of the institution should instruct the concerned officers in-charge of the student activities in their institution to endorse the leave application).

d) Any other leave the Head of the Institution deems reasonable for co-ordination.

SYLLABI FOR

VARIOUS SUBJECTS

ANATOMY


Skull
Cranium
Spinal Column
Cervical Vertebrae
Mandible
Thoracic Vertebrae
Clavicle
Manubrium
Scapula
Sternum
Ribs
Lumbar Vertebrae
Humerus
Ulna
Radius
Pelvic Girdle
Sacrum
Coccyx
Carpals
Metacarpals
Phalanges
Femur
Patella
Tibia
Fibula
Tarsals
Metatarsals
Phalanges

ANATOMY

Pre clinical subjects

The teaching of Anatomy will be more oriented towards the basic principles of the subject giving more emphasis on their applied aspects.

Goal:

The broad goal of the teaching of undergraduate students in Anatomy aims at providing comprehensive knowledge of the human body in the following branches in the subject.

1. Gross Anatomy
2. Microscopic Anatomy(Histology)
3. Developmental Anatomy
4. Anatomical basis for the clinical correlation and diseased conditions of the body.

Objectives:

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

1. To understand the normal position, clinically relevant relationships, functional and cross sectional anatomy of various structures of the body.
2. Identify the microscopic sections of various tissues and organs and correlate the structure with functional aspects of the organs which is a prerequisite for understanding the pathological state of the tissue in diseased conditions.
3. In nervous system they shall understand the basic structure and connections of each part and analyze the various functions and connections of it and interpret the gross lesions in relation to its structure.
4. In developmental anatomy(embryology), they should be able to recognize basic principles of various normal and critical stages of development, effects of common teratogens, genetic mutations and environmental hazards and should appreciate the developmental and congenital anomalies on the basis of development of each organ.

Skills:

At the end of the program the student should be able to:

1. Identify and locate all the structures of the body and mark the topography of the living body.

2. Identify the organs and tissues under microscope.
3. Understand the principle of karyotyping.
4. Understand gross congenital anomalies.
5. Understand the principles of newer imaging techniques, interpret CT scans, ultrasonograms, plain and contrast X—rays.
6. Understand the clinical basis of some common clinical procedures like intramuscular injections, PV, PR, intravenous injections, lumbar puncture, kidney biopsy, bronchoscopy, tracheostomy, urinary catheterization, fundus examination using ophthalmoscope, otoscope for viewing tympanic membrane.

Integration:

Integrated teaching of all basic sciences subjects should be done as far as possible for certain systems and organs so that the student shall be able to get a comprehensive idea and functions of the organs and systems of the body and correlate them with anatomical basis.

Certain topics of clinical importance should be done in an integrated method involving all basic sciences departments and relevant clinical departments.

PAPER—1

Portions:—

1. General Anatomy
2. General embryology and embryology of the organs and tissues
3. General Histology and systemic histology
4. Upper limb
5. Lower limb
6. Abdomen Pelvis and Perineum

General Anatomy:

Introduction to all systems:

Anatomical terms and positions , planes etc

Skeletal system, joints

Muscular system

Cardiovascular system

Nervous system

Digestive system

Respiratory system

Urogenital system

Endocrine system

Gross anatomy

Dissection to be done by all staff and students

Demonstration of important regions to be done using prosected specimens.

Detailed origin and insertion of muscles to be replaced by essential attachments of important muscles and their nerve supply and action.

Upper Limb

Osteology :

Clavicle, Scapula, Humerus, Radius, Ulna and Carpals

Side identification and important muscular attachments

Regions:

Pectoral region, axilla, mammary gland,

Arm---flexor and extensor compartments

Forearm--flexor and extensor compartments

Palm and dorsum of hand

Muscles and fasciae of these regions

Nerves: Brachial plexus, axillary, median, ulnar , radial and musculocutaneous.

Arteries: Axillary brachial, ulnar, radial and palmar arches

Veins: Cephalic, basilic, median cubital and axillary

Joints: Shoulder, elbow, radioulnar, wrist and carpometacarpal joint of thumb

Spaces: Quadrangular and triangular and fascial spaces of hand

Fossae: Cubital, anatomical snuff box

Retinacula: flexor and extensor

Lymphatics: Lymphatic drainage of upper limb, mammary gland

Applied, surface and radiological anatomy

Lower Limb

Osteology:

Hipbone, femur, tibia, fibula, calcaneum, talus, navicular and cuboid

Regions :

Thigh: 3 compartments - flexor, extensor and medial or adductor

Gluteal region

Leg: 3 compartments - extensor, flexor and lateral (peroneal).

Foot: dorsum and plantar (sole)

Muscles and fasciae of these regions

Nerves: Sciatic, femoral, obturator, tibial and common peroneal

Arteries: Femoral, obturator, popliteal, tibial ,dorsalis pedis and anastomoses: cruciate, trochantric and knee.

Veins: Saphenous, femoral and popliteal,

Fossa and spaces: Femoral triangle, adductor canal and popliteal fossa

Sheath: Femoral and iliotibial tract

Retinacula: Flexor and exrensor

Lymphatics: Lymphatic drainage of lower limb,inguinal and popliteal nodes

Applied, surface and radiological anatomy of lower limb

Abdomen, Pelvis and Perineum

Osteology:

lumbar vertebrae, articulated pelvis

Planes and quadrants of anterior abdominal wall

Testis, scrotum, spermatic cord and Penis

Peritoneum: lesser sac, lesser omentum, greateromentum, mesentery

Organs: Stomach, spleen, duodenum, pancreas, liver and extrahepatic biliary apparatus, intestine(small and large) kidney and ureter,

Pelvis and perineum:

Urinary bladder, rectum and anal canal

Urogenital region:

Superficial and deep perineal pouches, perineal membrane

Male genital organs:, epididymis, , seminal vesicle, vas deferens, and prostate.

Female genital organs: uterus, vagina, f allopian tube, ovary

Anal region: ischiorectal fossa

Posterior abdominal wall: lumbar plexus, muscles

Thoraco abdominal diaphragm, Pelvic diaphragm

Arteries: abdominal aorta, celiac trunk, superior mesenteric and inferior mesenteric arteries

Veins: inferior vena cava, portal vein

Applied, surface and radiological anatomy

PAPER—2

Portions:

1. Thorax
2. Head and Neck
3. Brain
4. Histology and embryology of the organs concerned.

Thorax

Osteology:

Sternum, ribs and thoracic vertebrae

Thoracic wall: intercostal spaces,muscles,nerves,arteries and veins

Mediastinum: definition,boudaries,subdivisions and contents

Pleura: reflection and recesses

Lungs and bronchopulmonary segments

Heart and pericardium, right atrium in detail, blood supply of heart

Phrenic nerve, azygos veins, thoracic duct, trachea, arch of aorta and oesophagus

Thoracic sympathetic chain

Applied, surface and radiological Anatomy

HEAD AND NECK

Osteology:

Skull: full, base and foramina, individual skull bones, mandible, cervical vertebrae, Fetal skull.

Scalp and face: muscles, vessels and nerves and applied anatomy

Triangles of neck: anterior, posterior

Midline structures in neck - superficial and deep - strap muscles and thyroid gland

Cranial cavity: Dural folds and dural venous sinuses

Orbit : Boundaries and contents

Pituitary gland

Fossae: Temporal and infratemporal

Salivary gland: Parotid and submandibular

Joint: Temporomandibular

Muscles of mastication

Arteries: Internal and external carotid, maxillary, subclavian, vertebral and middle meningeal

Veins : Retromandibular, facial, internal jugular and external jugular

Nerves: All cranial nerves (12 pairs), cervical plexus, ansacervicalis

Lymph nodes: cervical and lymphatic drainage of all structures

Nose: external, cavity, lateral wall and nasal septum and paranasal air sinuses

Pharynx: subdivisions, muscles

Tongue, tonsil

Larynx

Eyeball: muscles, vessels, layers, nerves etc

Ear: external, middle and Internal Ear

Applied, surface and radiological Anatomy

BRAIN AND SPINAL CORD

SPINAL CORD

Vertebral canal: contents

Meninges

Features: external and internal

Sections : levels

Blood supply

Applied, surface and radiological Anatomy

BRAIN

Meninges

Brain stem: medulla oblongata, pons, midbrain - features, sections, blood supply and lesions

Cerebellum and peduncles

Cerebrum: sulci and gyri, white mater, basal ganglia blood supply, thalamus and hypothalamus

Ventricles of brain: lateral, third and fourth ventricle

CSF circulation, subarachnoid cisterns

Blood supply of Brain

Applied and surface anatomy, CT and MRI.

Paper - 1

Portions:

1. General Anatomy,
2. General embryology and embryology of the organs and tissues
3. General Histology and systemic histology
4. Upper limb
5. Lower limb
6. Abdomen, Pelvis and Perineum

Paper - 2

Portions:

1. Thorax
2. Head and Neck
3. Brain
4. Embryology --neural tube, tongue and face development and Pharyngeal arches.
5. Histology of structures concerned

UNIVERSITY EXAMINATION

THEORY:

2 Papers of 100 marks each and 3 Hours Duration.

PATTERN OF QUESTION PAPER:

Marks: each paper – 100 marks

MCQs	=	20 X 1 = 20 Marks
Applied Questions	=	2 X 10 = 20 Marks
Short Answer Questions	=	12 X 5 = 60 Marks

Total: 100 Marks

Each paper will have 2 sections.

PRACTICAL MARK DISTRIBUTION

Practical mark: 100

Practicals:

Gross Anatomy

Spotters:	= 20
Discussion:	= 20

Histology

Spotters:	= 20
Discussion:	= 20

Total:80

Viva = 20

INTERNAL ASSESSMENT – MARK DISTRIBUTION

I.A. MARK – 100

Theory	= 40
Practical	= 40
Record notebook	= 20
	Total: 100

PASS CRITERIA:

	MAXIMUM	**MINIMUM**
Theory(Paper I & II)	200	100
Practical	80	40
Viva	20	-
Practical + Viva	100	50
Internal Assessment	100	40
GRAND TOTAL:	400	200

PHYSIOLOGY

PHYSIOLOGY

GOAL

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

OBJECTIVES

1. **KNOWLEDGE**

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

   a. Explain the normal functioning of all the organ systems and their interactions for well coordinated total body function.
   b. Assess the relative contribution of each organ system to the maintenance of the milieu interior.
   c. Elucidate the physiological aspects of normal growth and development.
   d. Describe the physiological response and adaptations to environmental stresses.
   e. List the physiological principles underlying pathogenesis and treatment of disease.

2. **SKILLS**

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

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

3. **INTEGRATION**

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

GENERAL PHYSIOLOGY

Homeostasis - Concept of maintenance of internal environment.

Feed Back Mechanisms – Types examples.

Body fluids – Total body water. Body fluid compartments. Composition of body fluids. Concept of electoneutrality: Anion gap. Osmolarity of body fluids. Tonicity. Osmolarity of body fluids starling forces. Edema.

CELL – Structural & functional in brief. Cell Membrane transport – Passive & active. Endocytosis & Exocytosis. Membrane potential resting membrane Potential, Action Potential, NERNST EQUATION.

CELL SIGNALING – Cytoplasmic and nuclear receptors. Membrane receptors – Ionotropic and metabotropic.

BLOOD

1. **INTRODUCTION TO BLOOD:**
    - Composition and functions of blood.
    - Plasma proteins.
    - Blood volume & measurements of blood & plasma.
2. **HEMOPOIESIS AND BONE MARROW:**
3. **RED BLOOD CELL:**
    - Physical characteristics, concentration and causes for physiological variation, functions, sites of red blood cell production, general changes that take place during erythropoiesis, regulation/factors affecting erythropoiesis, Life span and destruction of RBCs, Hematocrit/PCV.
    - Normal values for Indian population.
    - MoNrphology & functions.
4. **HEMOGLOBINS AND BLOOD INDICES:**
    - Components of Hb, types, normal levels (Indian population also).
    - Role in gas transport.
    - Oxygen-Hb dissociation curve (done under resp system).
    - Oxygen carrying capacity of blood.
    - Hemoglobin as a buffer.
    - Reduced hemoglobin and cyanosis.
    - Abnormal Hb.
    - Breakdown, Hemolytic jaundice.

5. **PATHOPHYSIOLOGY OF ANEMIA AND POLYCYTHEMIA:**
    - Anemia - Definition etiological classification, morphological classification, effects, symptoms and signs.
    - Reticulocyte count – normal value and causes for increased and decreased reticulocyte count, reticulocyte response.
6. **BLOOD GROUPS AND PHYSIOLOGICAL BASIS OF BLOOD TRANSFUSION:**
    - Importance of blood groups.
    - ABO system.
    - Genetic determination.
    - Agglutinins in plasma.
    - Frequency of different blood groups in India.
    - Rh incompatibility.
    - Presence of other minor blood group systems.
    - Blood grouping/typing.
    - Cross match.
    - Erythroblastosis Fetalis: prevention, treatment.
    - Transfusion reactions.
7. **WHITE BLOOD CELLS:**
    - Normal count.
    - Types – granulocytes, agranulocytes.
    - Morphology.
    - Differential count.
    - Conditions in which counts are increased and decreased.
    - Functions of neutrophils, eosinophils, basophils, mast cells.
    - Lymphocytes, monocytes.
    - Monocyte macrophage system.
    - Leucopoiesis.
    - Gross changes during maturation.
8. **PLATELETS AND THEIR ROLE IN HEMOSTASIS:**
    - Formation from megakaryocytes, normal count, Life span & removal.
    - Functions.
    - Thrombocytopenia – causes and effects.

9. **HEMOSTASIS:**
    - Mechanisms involved in hemostasis:
        - Clotting mechanism.
        - Clotting factor.
        - Clot & clot retraction.
    - Anticlotting and fibrinolytic mechanism in the body.
    - Anticoagulants used in laboratory.
    - Abnormalities of coagulation – Tests of hemostasis platelet count, BT, CT, PT, APPTT, factor assays.
10. **LYMPH:** Retieulo endothelial system.

MUSCLE

Structure of Skeletal Muscle – Morphology, Types, E.M. Structure. Muscle Protein. SarcoTubular system. Electrical activity in the Muscle. Muscle contraction & relaxation – Molecular Basis of excitation contraction coupling, Type of Muscle contraction. Changes in the muscle during muscle Contraction. Motor unit. Neuro muscular junction, Drugs acting on neuro Muscular junction Muscle Twitch-2 Sucessive stimuli & fatigue.

E.M.G.

Smooth Muscle – Properties, Types & functions. cardiac muscle – Structure. Comparison of 3 types of Muscles.

NERVE

Neuron – Structure, functional features (Erlanger & gassers classification) functional classification. Neuroglia general feature, types function. Myelination Nerve impulse Excitation & conduction. Ionic Basis.Saltatory conduction.

Neural growth. Nerve injury. Wallerian degeration.

Autonomic Nervous System

Organization of the system.

Description of sympathetic & parasympathic Nervous system.

Chemical neurotransmission.

Effects of sympathetic & Parasympathic stimulaitaion.

GASTROINTESTINAL (GI) SYSTEM

1. Introduction to GI system (functional organization and principles of regulation)
2. Gastrointestinal Hormones.
3. Principles of GI secretion; gastric function testes and pathophysiology of peptic ulcer.
4. Pancreatic secretion and pancreatic function tests.
5. Functions of liver and pathophysiology of jaundice.
6. Biliary secretion.
7. Intestinal secretion.
8. Secretions of large intestine.
9. Introduction to gastrointestinal motility.
10. Chewing and deglutition.
11. Esophageal motility.
12. Gastric motility.
13. Small intestinal motility.
14. Motility of large intestine.
15. Principles of digestion and absorption.

THE RENAL SYSTEM

1. General introduction and functional anatomy of kidney.
2. Renal blood flow.
3. Glomerular filtration.
4. Tubular functions.
5. Mechanisms of urine concentration and dilution.
6. Water excretion, diuresis and diuretics.
7. Acidification of urine.
8. Kidney function tests.

9. Physiology of micturition and bladder dysfunctions.
10. Structure and functions of skin.
11. Regulation of body temperature and acclimatization to cold & hot environments.

ENDOCRINE PHYSIOLOGY

1. Introduction to endocrinology.
2. Receptors and mechanisms of hormone action.
3. Hypothalamus and hyothalamopitutitary axis.
4. Pituitary gland:
    - Introduction.
    - Physiological anatomy of pituitary gland.
    - Anterior pituitary hormones – physiology of growth – clinical correlates TSH,ACTH, LH, FSH, PL hormones and functions.
    - Intermediate lobe – propiomelanocortin.
    - Posterior pituitary hormones synthesis, secretion, actions.
    - Hypothalamus – hormones – functional anatomy.
    - Interrelationship between hypothalamus, anterior & posterior pituitary and target organs.
    - Clinical correlation – hypo & hypersecretion.
5. The thyroid gland.
    - Physiological anatomy, formation, secretion, transport and metabolism of T3 & T4. Effects of thyroid hormone & regulation of its secretion – hypo & hypersecretion – clinical correlation calcitonin.
6. Parathyroid glands
    - Ca. & phosphorous metabolism – bone physiology – Vit. D. & calcitriol.
    - Physiological anatomy, secretions, transport and functions of parathormone.
    - Effect of other hormones and hormonal agents on calcium homestasis. Hypo & hypersecretion – clinical correlation.
7. The endocrine pancreas

    Pancreas:
    - Introduction - islet structure – biosynthesis and secretion of insulin.
    - Fate, effects, mechanism of action of insulin – clinical correlation – hypo & hypersecreation – diabetes mellitus.

- Regulation of insulin secretion.
- Glucagon, other islet cell hormones and their effects.

Adrenal glands:

- Introduction
- Adrenal medulla – morphology – biosynthesis functions and regulation of adrenal medullary hormones – phaeochromocytoma.
- Adrenal cortex – structure – biosynthesis of adrenal cortical hormones – transport, metabolism and excretion of adrenal cortical hormones.
- Effects of adrenal androgens and oestrogens.
- Glucocoticoids – physiological effects.
- Regulation of secretion.
- Mineralocorticoids – regulation of aldosterone secretion – role played by in the regulation of salt balance.
- Adrenocortical hypo & hyperfunction in humans.

8. Minor endocrine glands:
    - Kidney, pineal body, thymus, atrium of heart.
9. Local hormones:
    - Bradykinin, substance P, prostaglandin, histamine, serotonin, etc.

REPRODUCTIVE SYSTEM

1. Introduction: sex differentiation and chromosomal sex in brief factors influencing differentiation of genitalia.
2. Male gonads and genitalia – structure – gametogenesis – erection, emission and ejaculation – semen composition endocrine function of testis – biosynthesis, secretion and sanction and actions of hormones control of testicular function – abnormalities.
3. Female gonads and genitalia – ovarian function – menstrual cycle, hypothalamus, pituitary, ovary, uterus, vagina cyclic changes – biosynthesis, secretion and actions of oestrogens and progesterone.
4. Fertilization and conception –contraception – corpus luteum of pregnancy – chorion and placenta – hormones – pregnancy tests – physiology of pregnancy – labor – lactation physiology of contraception.

THE RESPIRATORY SYSTEM

1. ORGANISATION OF RESPIRATORY SYSTEM:

- Overview of the respiratory tract mentioning the associated structures.
- Functions of the nose in humidifying air, smell, trapping dust particles.
- The functions of the para – nasal sinuses.
- The importance of the mucous layer overlying the respiratory passage.
- A basic overview of the histology of the respiratory pathway.
- The structure of the bronchial tree.
    - Conducting zone.
    - Respiratory zones.
- Bronchial musculature. Influences of sympathetic and parasympathetics.
- Overview of the pulmonary vasculature.
- Introduction to the lobar structure of the lungs.

2. VENTILATION:

2.1 MUSCLES OF RESPIRATION

- Muscles of inspiration and expiration.
- Accessory muscles of respiration.
- The normal respiratory rate.
- The importance of recognizing usage of the accessory muscles of respiration.

2.2 RESPIRATORY PRESSURES

- Intra alveolar pressure.
- Intra pleural pressure. Emphasis on the importance of the negative intra pleural pressure.
- Trans pulmonary pressure.
- Changes in alveolar and intra pleural pressure during respiration
- The negative intrapleural pressure as a cause for pnemothorax in trauma, and iatrogenic cases.

2.3 AIRWAY RESISTANCE

- Site of air way resistance.
- Changes in airway resistance with inspiration and expiration.
- Role of the sympathetic and parasympathetics on bronchial tone.

2.4 COMPLIANCE

- Definition.
- Factors affecting compliance – elasticity of lung tissue and surface tension of alveolar lining.
- Conditions of increased and decreased compliance.

2.5 SURFACE TENSION, SURFACTANT

- An introduction to surface tension in air liquid interface.
- Law of Laplace.
- Composition and secretion of surfactant, cells that secrete surfactant.
- Mechanism of action of surfactant.
- Functions of surfactant.

3. LUNG VOLUMES AND CAPACITIES:

- Spirogram.
- Lung volumes & capacities.
    - Tidal volume.
    - Inspiratory reserve volume.
    - Expiratory reserve volume.
    - Residual volume.
    - Vital capacity.
    - Functional residual capacity.
    - Total lung capacity.
    - Inspiratory capacity.
    - Timed vital capacity and forced expiratory volumes.
- The physiological significance of the functional residual capacity.
- Changes in FEVI and FVC and the FEVI/FVC ratio in obstructive and restrictive diseases.

4. DEAD SPACE:

- Anatomical dead space.
- Physiological dead space.
- Ventilation/perfusion ratio V/Q
- High V/Q contributing to the physiological dead space.
- Low V/Q effectively serving as a shunt.

5. GAS EXCHANGE:

- Fick's law of diffusion.
- Factors that affect rate of gas diffusion.
- Composition of atmospheric, tracheal and alveolar air.

6. TRANSPORT OF OXYGEN:

- The forms of transport of oxygen.
- The combination of oxygen with hemoglobin.
- Oxygen carrying capacity of the blood.
- Oxygen hemoglobin dissociation curve
- Sigmoid nature of the dissociation curve and the reason behind it.
- Bohr Effect.
- Hypoxia and the types of hypoxia.
- High altitude physiology.
- Cyanosis.

7. TRANSPORT OF CARBON DIOXIDE:

- Forms of transported carbon dioxide.
- Chloride shift.
- Haldane effect.

8. CONTROL OF RESPIRATION:

- Respiratory centers.
- Neural control of respiration.
- Chemical control of respiration.
- Central and peripheral chemoreceptors.
- Carbon dioxide as respiratory drive.
- Respiratory Alkalosis.
- Respiratory Acidosis.

9. PULMONARY CIRCULATION:

- Pressure within pulmonary blood vessels.
- Blood volume in lungs and its significances in posture.
- Hypoxic vasoconstriction.

10. EXERCISE:

- Effect of exercise on the respiratory system.

- Types of exercise – aerobic (endurance) and anaerobic (resistance) exercises. And their benefits.
- Concept of VO2 maximum.
- The concept of oxygen debt.

11. COMMON RESPIRATORY PROBLEMS:

- An introduction to the common respiratory disease, Emphasis should be laid on the structural and physiological changes that occur in these diseases. A mention of major signs that are tests for in the respiratory examination.
- Pleural effusion.
- Pneumothorax.
- Pneumonia and consolidation.
- COPD.
- Asthma.
- Restrictive lung diseases.

12. PULMONARY FUNCTION TESTS:

- Spirometry.
- Arterial blood gases.

13. MISCELLANEOUS:

- Definition of asphyxia and common causes.
- Physiological basis of artificial ventilation.

CARDIOVASCULAR SYSTEM

1. Functional organization of cardiovascular system.
2. Functional anatomy and innervations of heart.
3. Properties of cardiac muscle – action potential.
4. Electrophysiology of heart – origin and spread of cardiac impulse..
5. The electrocardiogram.
6. Cardiac cycle.
7. Cardiac output.
8. Heart rate and arterial pulse.
9. Principles of hemodynamics.
10. The arterial system.

11. The venous system.
12. Capillary and lymphatic circulations.
13. Blood pressure and its regulation.
14. Integrated regulation of cardiovascular system.
15. The regional circulations – pulmonary, cerebral, coronary, splanchnic, cutaneous & foetal circulations.
16. Applied and clinical aspects of cardiovascular system - hypertension, hypotension and heart failure.

CENTRAL NERVOUS SYSTEM – NEUROPHYSIOLOGY

FUNCTIONAL ORGANISATION OF NERVOUS SYSTEM

1. Neuron – structure, types – neuroglia – nerve degeneration, regeneration – denervation hypersensitivity.
2. Sensory receptors – classification and function. Electrical and lonic events in receptors – receptor potential.
3. Synapse and junctional transmission – properties. Neuro transmitters synaptic plastically and learning.
4. Reflexes – introduction – mono and poly synapatic reflexes – properties.
5. Spinal cord – structure – transverse section – anterior nerve root posterior nerve root – ascending tracts, posterior column & anterolateral system. spinocerebellar tracts.
6. Pain – types – pathway – referred pain – pain inhibiting pathways.
7. Descending tracts – pyramidal and extra pyramidal tracts – complete section, hemisection of spinal cord.

SPECIAL NEUROPHYSIOLOGY:

1. Cerebral cortex – layers, lobes, methods of study, function of each lobe.
2. Thalamus – thalamic nuclei, connections, functions thalamic syndrome.
3. Basal ganglia – nuclei, connections, circuits, functions – lesions – of basal ganglia.
4. Hypothalamus – nuclei, connections, functions - lesions – experimental of clinical syndromes.
5. Reticular formation – ascending and descending pathways, ARAS.
6. Sleep – theories – physiological changes during sleep. REM & NREM disorders of sleep.
7. Cerebellum – lobes – cortex, circuitry – deep nuclei, connections. Cerebellar disorders – cerebellar function tests.

8. Vestibular apparatus – semicircular canal, otolith organs – mechanism of equilibrium.
9. Maintenance of posture, tone, equilibrium – muscle spindle types.
10. Autonomic nervous system – functional organization.
    - Sympathetic system.
    - Parasympathetic system.
    - Control of autonomic function.
    - Autonomic dysfunction.
    - Autonomic function tests.
11. Limbic system – parts, circuits, functions.
12. Higher functions – mechanism of speech – mechanism of learning – mechanism of memory, types – conditioned reflexes.
13. C.S.F. formation, circulation, absorption, function, lumbar puncture.

SPECIAL SENSES

Introduction:

1. Vision – functional anatomy – aqueous humor – glaucoma. Image forming mechanism. Refractory error. Layers of retina photoreceptors – photochemistry of vision – light and dark adaptation. Electrical responses, electro retinogram, visual pathway, lesions – colour vision – movements.
2. Hearing – functional anatomy – middle ear function – cochlea – auditory pathway – hearing defects – tests for hearing defects – tests for hearing, audiogram.
3. Smell – receptor organ pathway.
   Physiology of olfaction – abnormalities.
4. Taste – receptor organ and pathway
   Physiology of taste – abnormalties.

INTEGRATED GENERAL TOPICS

1. Basic principles of acid – base homeostasis.
2. Regulation of volume, composition and osmolality of body fluid compartments.
3. Physiology of growth and development.
4. Physiology of aging; oxidative stress; prevention of aging; and physiology of yoga.
5. Physiology of exercise.

PRACTICAL PHYSIOLOGY

MAJOR EXPERIMENTS:

1. Erythrocyte count.
2. Leucocyte count.
3. Leucocyte differential count.
4. Eosinophil count.
5. Clinical examination of cardio vascular system.
6. Clinical examination of respiratory system.
7. Clinical examination of sensory system.
8. Clinical examination of motor system.
9. Clinical examination of 1 – 6 cranial nerves.
10. Clinical examination of 7 – 12 cranial nerves.
11. Clinical examination of superficial and deep reflexes.
12. Effect of posture / exercise on blood pressure.

MINOR EXPERIMENTS:

1. Estimation of hemoglobin.
2. Erythrocyte sedimentation rate.
3. Blood groups – Rh factor, ABO system.
4. Bleeding time and clotting time.
5. Respiratory efficiency test / peak flow meter.
6. Recording of respiratory movements using stethograph.
7. Cerebellar function tests.
8. Clinical examination of any one or more cranial nerves.
9. Clinical examination of superficial reflexes.
10. Clinical examination of any one or more deep reflexes.
11. Demonstration the tests for hearing.
12. Demonstrate pupillary reflexes.

CHARTS:

1. Discussion of comments – problem oriented.
2. Discussion of calculations.

UNIVERSITY EXAMINATION

THEORY:

2 Papers of 3 hours duration and 100 marks each.

PAPER – I

1. Muscle & tissue.
2. Blood.
3. Gastrointestinal physiology.
4. Excretion & body fluids.
5. Endocrinology.
6. Reproduction.

Paper – II

1. Respiration.
2. CVS.
3. Special senses.
4. CNS.

PATTERN OF QUESTION PAPER:

Marks: each paper – 100 marks

MCQs	=	20 X 1 = 20 Marks
Applied Questions	=	2 X 10 = 20 Marks
Short Answer Questions	=	12 X 5 = 60 Marks

Total: 100 Marks

Each paper will have 2 sections.

PRACTICAL:

Practical – I 1½ hours.

1. Haemotology major expt. = 20 marks
2. Haemotology minor expt. = 10 marks
3. Chart – comment/calculation = 10 (5 + 5) marks

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40 marks

PRACTICAL:

Practical – II 1½ hours.

1. Clinical physiology major expt. = 20 marks
2. Clinical physiology minor expt. = 10 marks
3. Chart – comment / calculation = 10 marks

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40 marks

Viva = 20

PASS CRITERIA:

	MAXIMUM	**MINIMUM**
Theory(Paper I & II)	200	100
Practical	80	40
Viva	20	-
Practical + Viva	100	50
Internal Assessment	100	40
GRAND TOTAL:	400	200

BIOCHEMISTRY

BIOCHEMISTRY

GOAL:

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

OBJECTIVES:

a) **KNOWLEDGE:**

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

a. Describe the molecular and functional organization of a cell and list its subcellular components;
b. Delineate structure, function and inter-relationships of biomolecules and consequences of deviation from normal;
c. Summarize the fundamental aspects of enzymology and clinical application wherein regulation of enzymatic activity is altered;
d. Describe digestion and assimilation of nutrients and consequences of malnutrition;
e. Integrate the various aspects of metabolism and their regulatory pathways;
f. Explain the biochemical basis of inherited disorders with their associated sequelae;
g. Describe mechanisms involved in maintenance of body fluid and pH homeostasis;
h. Outline the molecular mechanisms of gene expression and regulation, the principles of genetic engineering and their application in medicine;
i. Summarize the molecular concepts of body defense and their application in medicine;
j. Outline the biochemical basis of environmental health hazards, biochemical basis of cancer and carcinogenesis;

k. Familiarize with the principles of various conventional and specialized laboratory investigations and instrumentation analysis and interpretation of a given data;

l. Suggest experiments to support theoretical concepts and clinical diagnosis.

b) **SKILLS:**

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

a. Make use of conventional techniques/instruments to perform biochemical analysis relevant to clinical screening and diagnosis;

b. Analyze and interpret investigative data;

c. Demonstrate the skills of solving scientific and clinical problems and decision making;

c) **INTEGRATION:**

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

BIOCHEMISTRY – SYLLABUS

I. **CELL:**

Sub cellular Components - Molecular and functional organization.

Plasma membrane, cytoplasm, nucleus and sub cellular components, like mitochondria, endoplasmic reticulum, lysosomes, peroxisomes, cytoskeleton, golgi apparatus etc.

II. **BIOMOLECULES:**

INTRODUCTION

a. Chemistry of Carbohydrates – Monosaccharides, disaccharides – homo and hetero polysaccharides.

b. Chemistry of Lipids – Classification, fatty acids, elcosanoids and derivatives triglycerides, phospholipids, cholesterol, and lipoprotein.

c. Nucleic acids: nucleotides – DNA & RNA structure, nucleic acid analogues of medical importance.

d. Structure of Hemoglobin, myoglobin – structure relationship with the function.

Abnormal hemoglobin, myoblobin – structural relationship with the function.

Abnormal hemoglobin – congenital and acquired.

e. Vitamins and minerals – (in brief details in nutrition).

III. **ENZYMES:**

a. Fundamental aspects of enzymology – definition, classification, mechanism of action, factors affecting enzyme activity – Enzyme regulation – Coenzymes – Isozymes – enzymes of clinical importance.

IV. **NUTRITION:**

Digestion and assimilation of nutrients:-

- ❖ Carbohydrates, proteins, lipids, vitamins and minerals.
- ❖ Nutritional requirements – RDA, SDA balanced diet and limiting amino acid.
- ❖ Vegetarianism.
- ❖ Consequences of malnutrition Marasmus, Kwashiorkor, over nutrition.

V. **METABOLOSM AND REGULATORY PATHWAY:**

1. Introduction to metabolism:
   a. Emphasize the purpose of metabolism like energy production, interconversion and synthesis of important bio molecules etc.
   b. High energy compounds.
   c. Biological oxidation – enzymes involved – oxidative phosphorylation – theories – shuttles.
2. Metabolic pathway, regulation and metabolic errors:
   a. CARBOHYDARATE:

      Glycolysis - HMP pathway – gluconeogenesis – uronic acid pathway – glycogen metabolism – fructose and galactose metabolism – fructose and galactose metabolism and TCA cycle. Regulation of blood glucose – Diabetes mellitus – Hypoglacemia – Hyper glycaemis. Inborn errors of carbohydrate metabolism.

      Clinical important investigations pertaining to carbohydrates metabolism – reduction test of urine, differential diagnosis for glycosuria including

chromatography. Blood sugar values, GTT, glycosylated haemoglobin, fructosamine.

b. LIPID METABOLISM:

Synthesis of fatty acid – Fatty acid oxidation – energetic of oxidation, ketone bodies, metabolism of unsaturated fatty acids – prostaglanding – prostacycline – thromboxanes – triglycerides – phospholipids – sphingolipids – cholesterol and its derivatives apoproteins – fatty liver lipotropic factors.

Clinically important investigation pertaining to lipids and lipoproteins.

c. PROTEIN METABOLISM:

Dynamic state of body proteins – interorgan transport of amino acids – ammonia production – transport and body amino acid pool – its disposal – urea cycle.

Metabolism of individual amino acids

Biologically important compounds obtained from amino acids including gamma aminobutyric acid and polyamines.

Clinically important investigations pertaining to protein metabolism - total protein – albumin – globulin – A G ratio – serum protein electrophoresis – blood urea – BUR – serum creatinine – urea and creatinine clearances – amino acid chromatography for screening inborn errors.

d. INTEGRATION OF METABOLISM:

Main control sites of metabolic pathways and key enzymes.

Metabolic adaptation during fed state and starvation.

Metabolism in principal organs like liver RBC, adipose tissue, muscle, kidney, heart and brain.

e. NUCLEIC ACID METABOLISM:

Purine and pyrimidine synthesis and degradation – salvage pathways – abnormalities of nucleic and metabolism.

f. METABOLISM OF HAEMOGLOBIN, PROPHYRIAS AND BILIRUBINAEMIA:

Porphyrias, abnormal hemoglobin and jaundice and investigations pertaining to these disorders.

VI. **GENE EXPRESSION AND REGULATION:**

a. Principles of genetic engineering and their application in medicine.

Basics of genetics – chromosomal structure – arrangement of coding sequence and genetic code.

Bio synthesis of proteins with posttranslational modification.

b. Cell cycle

DNA replication and its repair – RNA synthesis and processing mutation.

c. Gene Expression and Regulation.

Operon concept, genetic switch – gene rearrangement – geneamplification – gene protein interaction.

d. Genetic engineering techniques and their application in medicine.

Restriction enzymes, vectors genome library – DNA probes – Blot transfer techniques.

Recombinant DNA technology, PCR polymerase chain reaction – clinical application of genetic engineering.

VII. **INBORN ERRORS:**

Biochemical basis of inherited disorders with their associated sequelae.

Introduction to various types of inheritance and type of mutation defect in relation to various inherited disorders.

a. Carbohydrates:
   - ❖ Glycogen storage disease, glalactosaemia G6PD deficiency. Lactose intolerance, fructose intolerance, fructosuria, pentosuria.

b. Lipids:
   - ❖ Disorder of FA oxidation, Sphingolipidosis, dyslipoproteinaemias.

c. Proteins:
   - ❖ Urea cycle disorder, inborn errors associated with each aminoacid.

d. Porphyrias, hyper bilirubineamia (congenital and acquired)

e. Hyperuricaemia, gout, orotic aciduria, lesch nyhan syndrome.
f. Neonatat screening for and prenatal diagnosis of inborn errors.

VIII. **HOMOEOSTASIS:**

Mechanism involved in the maintenance of constant composition body fluids and normal pH.

Metabolism of water and electrolytes homeostasis of pH – buffer system, rote of kidney and lungs – acid base disorders.

Blood gas analysis and its interpretation and correlation to acid base disorders.

IX. **IMMUNITY:**

Molecular concept of body defence and application in medicine.

Immunoglobin structure, type, synthesis and function – antigen binding – monoclonal anti bodies – hyper and hypogamma globulinaemia immunodeficiency and AIDS – biochemical methods of assessing the imunoglobilin RIA, ELISA.

X. **ENVIRONMENTAL HAZARDS AND CANCER:**

a. Biochemical basis of environmental hazards – occupational hazards (lead, organo phosphorus compounds etc). Hazards due to modern industrialization (HS) and traffic pollution (CO) xenobiotics.
b. Biochemical basis of cancer and carcinogenesis – Tumor makers.

XI. **LABORATORY INVESTIGATION:**

Principles of various conventional and specialized laboratory investigations and instrumentation analysis and interpretation of data.

a. Principles of conventional and specialized lab investigation including instrumentation analysis.
    - ❖ Conventional: - manual colorimetric methods for biochemical parameter (death with in practical classes).
        - Flame photometer.
        - Spectroscopy.
    - ❖ Specialized:- automated techniques semi and random auto analyser – ELISA – RIA – fluorimeter – blood gas analyser.

- ❖ Interpretation of date:
  - Normal ranges of biochemical parameters – causes for deviation from normal.

XII. **CLINICAL CHEMISTRY:-**

Experiments to support theoretical concept and clinical diagnosis.

a. Biochemical tests to determine the functional ability of an organ – liver function test – renal function test – pancreatic function test.

b. Investigations pertaining to hormones – mode of action of hormone and its function - thyroid function tests - parathyroid function tests – adrenal function tests.

c. Biochemical tests to confirm the clinical diagnosis of a diseases and their interpretation.

d. Jaundice (haemolytic, hepatic and obstructive) cirrhosis liver – acute renal failure, chronic renal failure, nephritic syndrome – myocardial infarction – diabetes mellitus, (mild, moderate and severe) – renal glycosuria – alimentary glycosuria – rickets – hypo and hyperparathyroidism – hypo and hyper thyroidism – pancreatitis.

Metabolic acidosis }
Alkalosis } both uncompensated and compensated.
Respiratory acidosis }
Alkalosis }

UNIVERSITY EXAMINATION

THEORY:

2 Papers of 3 hours duration and 100 marks each.

PAPER – I

1. Molecular and functional organization of cell and its subcellular components.

2. Chemistry, digestion, absorption and metabolism of carbohydrate and metabolic errors.
3. Chemistry, digestion, absorption and metabolism of lipids and metabolic errors.
4. Enzymes.
5. Vitamins.
6. Electron transport chain and biological oxidation.
7. TCA cycle and integration of metabolism.
8. Nutrition.
9. Porphyrins, Haemoglobin and bilirubin metabolism.

PAPER – II

1. Chemistry, digestion absorption and metabolism of protein and inborn errors of metabolism.
2. Chemistry and metabolism of nuclecic acids and errors of metabolism.
3. Molecular biology.
4. Water, electrolytes.
5. PH and its regulation.
6. Cancer Xenobiotics.
7. Minerals.
8. Hormones.
9. Laboratory instrumentation, investigation and interpretation.

PATTERN OF QUESTION PAPER:

Marks: each paper – 100 marks

MCQs	=	20 X 1 = 20 Marks
Applied Questions	=	2 X 10 = 20 Marks
Short Answer Questions	=	12 X 5 = 60 Marks

Total: 100 Marks

Each paper will have 2 sections.

PRACTICAL MARK DISTRIBUTION

Practical mark: 80

Qualitative experiment = 30

Quantitative experimental = 30

Chart – interpretation (clinical)= 10

Spotters = 10

Total: 80

Viva = 20

INTERNAL ASSESSMENT – MARK DISTRIBUTION

I.A. MARK – 100

Theory = 40

Practical = 40

Record notebook = 20

Total: 100

PASS CRITERIA:

	MAXIMUM	**MINIMUM**
Theory (Paper I & II)	200	100
Practical	80	40
Viva	20	-
Practical + Viva	100	50
Internal Assessment	100	40
GRAND TOTAL:	400	200

PATHOLOGY

PATHOLOGY:

GOAL:

The broad goal of the teaching of undergraduate student in Pathology is to provide the students with a comprehensive knowledge of the mechanisms and causes of disease, in order to enable him/her to achieve complete understanding of the natural history and clinical manifestations of disease.

OBJECTIVES:

A. KNOWLEDGE:

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

a. Describe the structure and ultrastructure of a sick cell, mechanisms of cell degeneration, cell death and repair and be able to correlate structural and functional alterations.
b. Explain the pathophysiological processes which govern the maintenance of homeostasis, mechanisms of their disturbance and the morphological and clinical manifestations associated with it.
c. Describe the mechanisms and patterns to tissue response to injury such that she/he can appreciate the pathophysiology of disease processes and their clinical manifestations.
d. Correlate normal and altered morphology (gross and microscopic) of different organ systems in common diseases to the extent needed for understanding of disease processes and their clinical significance.

B. SKILLS:

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

a. Describe the rationale and principles of technical procedures of the diagnostic laboratory tests and interpretation of the results;
b. Perform the simple bed-side tests on blood, urine and other biological fluid samples;

c. Draw a rational scheme of investigations aimed at diagnosing and managing the cases of common disorders;
d. Understand biochemical/physiological disturbances that occur as a result of disease in collaboration with pre clinical departments.

C. INTEGRATION:

a. At the end of training he/she should be able to integrate the causes of disease and relationship of different etiological factors (social, economic and environmental) that contribute to the natural history of diseases most prevalent in India.

I. CELL INJURY AND CELLULAR ADAPTATIONS:

a. Definition, causes – Chemical agents.
Physical agents.
Radiation.
Immunology.
Infections.
Genetics.
Free radical injury.
b. REVERSIBLE AND IRREVERSIBLE CELL INJURY:
Adaptation to cell injury, atrophy, hypertrophy, hyperplasia, metaplasia and dysplasia.
c. APOPTOSIS.
d. NECROSIS & GANGRENE.
e. INTRACELLULAR ACCUMULATION – LIPIDS, PROTEIN, GLYCOGEN, PIGMENTS.

PATHOLOGICAL CLASIFICATION

INFLAMMATION:

Acute inflammation

Causes, signs of inflammation humoral and cellular events of inflammation – margination chemotaxis phagocytosis, chemical mediators.

Chronic inflammation.

Causes, macrophages in chronic inflammation – special forms, granulomas.

REPAIR AND REGENERATION

Mechanism of repairing soft tissues, factors governing wound healing, fracture healing.

CIRCULATORY DISTURBANCES

Hyperemia and congestion, edema, thrombosis, embolism, infarction, shock.

GENETIC DISORDERS

Normal karyotype, mendelian disorders, autosomal recessive. X linked disorder, cytogenetic disorders, techniques – PCR, fish.

IMMUNOPATHOLOGY

Cells of immune system – antigen, antibody, T-lymphocytes, B-lymphocytes, T-cell receptors, primary and secondary lymphoid organs, major histo compatibility antigen, cytokines.

Functional immune response – antibody production, cell mediated immunity, non specific effector mechanism complement macrophages.

IMMUNO DEFICIENCY DISEASE

Hypersensitivity reactions, auto immune diseases, amyloidosis, principle of organ transplantation.

NEOPLASIA

Definition – nomenclature, difference between benign and malignant neoplasm, anaplasia, rate of growth, local invasion, metastasis, epidemiology – incidence geographic factors heredity.

Pre neoplastic disorders.

Molecular basis of cancer – oncogenes, cancer suppressor genes, genes that regulate apoptosis, genes that regulate DNA repair.

Biology of tumor growth – tumor angiogenesis, tumor progress, mechanism of invasion and metastasis vascular dissemination.

Carcinogenic agent – chemical carcinogenesis, physical radiation carcinogenesis, viral and microbial carcinogenesis.

Tumour immunity.

Clinical features of tumours, effect of tumour on host, paraneoplastic syndromes.

Grading and staging of tumour.

Lab diagnosis of cancer.

ENVIRONMENTAL AND NUTRITIONAL DISORDERS

Occupational disorders – tobacco, alcohol, drug abuse, radiation injury vitamin deficiency, protein, calorie, malnutrition.

INFECTIOUS DISEASES

Bacterial disease – gram positive, gram negative infection, typhoid, tuberculosis, leprosy, syphilis. Fungal infection.

Protozoal infection – amoeba, malaria.

Viral infection.

DISEASE OF INFANCY AND CHILDHOOD

Inborn errors of metabolism-phenyl ketonuria, galactosemia, cystic fibrosis, childhood tumors – benign and malignant.

SYTEMIC PATHOLOGY

Blood vessels - atherosclerosis

Arterio sclerosis

Aneurysms

Hypertensive heart disease

Valvualr heart disease

Infective endocarditis

Non bacterial endocarditis

Libman sack's endocarditis

Cardiomyopath/myocarditis

Pericarditis

Tumour of heart

LUNGS – ARDS, COPD – brochical asthma

Bronchictasis

Emphysema

Bacterial pneumonia – broncho pneumonia & lobar pneumonia.

Viral & mycoplasmal pneumonia lung abscess.

Pulmonary tuberculosis – primary & secondary.

Interstinal pneumonia.

Pneumoconiosis.

Tumours of lung.

GASTRO INTESTINAL TRACT

Barrett esophagitis.

Carcinoma esophagus.

Peptic ulcer.

Gastric carcinomas.

Malabsorption syndromes.

Idiopathic irritable bowel syndromes – crohns disease. Ulcerative colitis.

Tumours of small & large intestine – benign and malignant.

LIVER, BILIARY TRACT & PANCREAS

Pathology of jaundice.

Viral hepatitis.

Cirrhosis.

Alcoholic liver disease.

Inborn errors of metabolism – hemochromatosis, Wilsons disease.

Chole cystitis.

Gall stones.

Acute pancreatitis.

KINNEY: acute glomerulo nephritis.

Nephritic syndrome.
chronic glomerulonephritis.

Glomerular lesions associated with systemic disease – SLE.

Diabetes mellitus.

Amyloid.

Diseases of tubules / interstitium – pyelonephritis.

Diseases of blood vessels – benign nephrosclorisis.

Malignant hyper tension.

Obstructive uropathy – calculi.

Tumours of kidney – renal calculai.

Male genital system - carcinoma penis.

Pre malignant lesions.

Tumours of testis.

Prostate tumours.

Female genital system - carcinoma cervix. CIN.

Endometrium endomemetriosis. PCO.

Tumours of body of uterus.

Ovarian tumours.

Trophoblastic disease.

Brest - tumours of breast benign and malignant.

Endocrine system - thyroiditis, goiter, tumours, pheochromcytoma/

Neuroblastoma, diabetes mellitus, mulitiple endocrine neoplasia.

Skin - premalignant lesions & tumours.

Skeletal system - osteomylitis

Bone tumours – obteoblastoma

Osteosarcoma.

Ewing's tumour.

Giant cell tumour.

CNS - Meningitis.

Tumours – primary and secondary.

Lymphnodes - specific and non specific lymphadinities lymphomas.

Spleen - causes of splenomegaly.

Post mortem demonstrations – 10 autopsies.

HEMATOLOGY

Normal development of blood cells.

RBC disorders – anaemias – classifications and lab investigations.

Iron definiency anaemia.

Sideroblastic anaemia.

Megalo balstic anaemia.

Hemolytic anaemia.

Aplastic anaemia.

Poly cythemia.

WBC disorders - leucopenia.

Leukaemai/classification.

Agranulocytosis.

Leucocytosis.

Multiple myeloma.

BLEEDING DISORDERS

Due to vessel wall abnormality.

Thrombocytopenis - ITP

Drug induced.

Micro angiopathy.

Hemolytic uremic syndrome.

Due to defective platelet function.

Due to abnormalities in cloting factors.

Factor VIII.

VON Willebrand disease.

Hemophilia A & B.

DISSEMINATED INTRA VASCULAR COAGULATION.

PRACTICALS

Introduction to histopath & cytopath label.

Introduction to museum.

Cloudy swelling kidney.	-	Slide.
Fatty change liver	-	specimen & slide.
Abscess liver or lung	-	specimen & slide.
Acute appendicitis	-	specimen & slide.
Tuberculous granuloma	-	specimen & slide.
Foreign body granuloma	-	specimen & slide.
Granulation tissue	-	specimen & slide.
organizing thrombus	-	slide.
CVC – liver lung, spleen	-	slide.
Myocardial infarct	-	specimen & slide.
Gangrene foot	-	specimen.
Gangrene intestine	-	specimen.
Amylodi liver spleen kidney	-	specimen.
Infection diseases	-	specimen & slide.

Inflectional diseases - actinomycosis.

Madura mcosis.

TB lymphadenititis.

TB lung.

Ameobic abscess liver.

Ulcer intestine.

Vascular system atherosclerosis.

Artheriosclerosis.

Monkeberg's sclerosis.

Lung	bronchiectasis – specimen & slide.
	Lobar pneumonia – red hepatisation
	Grey hepatisation.
	Lung abscess.
	Emphysema.
	Pulmonary tuberculosis.
	Secondary deposit - LN
Liver	cirrhosis liver.
	Hepatoma.
Gall bladder	gall stones.
Salivary gland	pleomorphic adenoma.
Gastro intestinal system	gastric ulcer.
	Typhoid ulcer intestine.
	Amoebic ulcer.
	Crohn's disease.
	Carcinoma colon.
Benign tumours	lipoma
	Leiomyoma.
	Capillary, cavernous angioma.
	Schwannoma.
	Cystic teratoma ovary.
	Squamous papilloma.
	Villous papillous.
	Adenomatous polyp intestine.

	Chondroma.
Malignant tumours	squamous cell carcinoma.
	Chodrosarcoma.
	Metastatic melanoama.
	Osteosarcoma.
	Metastatic deposit lymphnode.
Genito urinary tract	cancer cervix.
	Cancer endometrium.
	Proliferative, secretory, endometrium.
	Ovarian tumours.
	Seminoma.
	Dys germinoma.
Kidney	hypernephroma.
	Wilm's tumour.
	Transitional cell carcinoma baldder.
Breast	fibroadenoma.
	Infiltrating ductal carcinoma.
Endocrine	colloid goiter.
	Hashimotos thyroiditis.
	Papillary carcinorma thyroid.
	Follicular carcinoma thyroid.
Skin	basal cell carcinoma.
	Squamous cell carcinoma.
	Malignant melanoma.

Bone	osteomyelitis, osteosarcoma.
	Giant cell tumours.
	Ewing's tumours.
Cytology	estrogenic phase.
	Progestational phase.
	Pregnancy smear.
	CIN I, II, III.
	Invasive carcinoma cervix.
	Adenoma carcinoma.
FNAC	positive slides.

PRACTICALS

CLINCAL PATHOLOGY CLASS SCHEDULE – 5 TH SEMESTERS.

1. Introduction to clinical pathology – sample collection, anticoagulants.
2. Urine examination.
3. Total RBC count.
4. Total WBC count.
5. Hemoglobin estimation.
6. Packed cell volume – demonstration and discussion.
7. Different count.
8. Peripheral smear - iron deficiency anaemia.
   Macrocytic anaemia.
   Megalo blastic bone marrow.
   Aplastic anaemia.
   Neutrophilia.
   Eosinophillia.
   Lymphocytosis.

Sickle cell anemia.

Spherocytosis.

Leukemia – AML

ALL

CML

CLL

Blood parasites.

9. ESR – demonstration & discussion.
10. Blood grouping and blood banking.
11. Bleeding time, clotting time.
12. Reticulocyte – slide demonstration.
13. Osmotic fragility test – demonstration.
14. Coomb's test – demonstration.
15. Bone marrow biopsy – demonstration.
16. CSF examination.
17. Sputum examination.
18. Semen analysis.
19. Exfoliative cytology.
20. Instrument demonstration.

UNIVERSITY EXAMINATION

THEORY:

2 Papers of 3 hours duration and 100 marks each.

PATTERN OF QUESTION PAPER:

Marks: each paper – 100 marks

MCQs	=	20 X 1 = 20 Marks
Applied Questions	=	2 X 10 = 20 Marks
Short Answer Questions	=	12 X 5 = 60 Marks

Total: 100 Marks

Each paper will have 2 sections.

PRACTICAL MARK DISTRIBUTION

Practical mark: 80

1. 2 HPE slides - 10
   1 cytology - 5
   1 haematology - 5

   Total: 20

   ---

2. Spotters
   2 HPE slides - 6
   3 specimens - 3
   I instrument - 1

   Total: 10

   ---

3. Major

   Haemotology - 20

4. Minor

   Hb or bl Gr. - 10

5. Urine exam - 20

Total: 80

Viva = 20

INTERNAL ASSESSMENT – MARK DISTRIBUTION

I.A. MARK – 100

Theory = 40

Practical = 40

Record notebook = 20

Total: 100

PASS CRITERIA:

	MAXIMUM	**MINIMUM**
Theory(Paper I & II)	200	100
Practical	80	40
Viva	20	-
Practical + Viva	100	50
Internal Assessment	100	40
GRAND TOTAL:	400	200

MICROBIOLOGY

k7015918 www.fotosearch.com

MICROBIOLOGY

GOAL:

The broad goal of teaching and training the medical graduates of modern scientific medicine in medical Microbiology/clinical microbiology is to provide an understating of the evolution of infectious diseases in order to deal with the etiology,pathogenesis, laboratory diagnosis,treatment and prevention of infections in the community.

OBJECTIVES:

a) KNOWLEDGE:

At the end of the course in medical Microbiology the student will be able to

1. List the various micro-organism, causing infections in human body (bacteria, viruses,fungi, parasites) describe about the pathogenesis of the diseases produced by micro-organism; and the human body's reactions to such infections.
2. State the sources of infections,modes of transmission of pathogenic micro organisms including the role of vectors in transmission of infections.
3. Describe about the various mechanisms of immunity to infections.
4. Acquire knowledge on choosing appropriate antimicobial agents for treatment of infections.
5. Acuquire knowledge about immunoprophylaxis and the availability of different vaccines for prevention of diseases.
6. Apply methods of sterilisation and use of disinfectants to prevent and control infections.
7. Recommend laboratory investigations regarding various clinical specimens.
8. Acquire knowledge about the availability of rapid and molecular techniques for diagnosis of infectious diseases.

b) SKILLS:

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

- Use aseptic and sterile techniques while performing simple invasive producers such as venepuncture.

- Choose the correct method of collection, storage and transport of clinical material for microbilogical investigations.
- Operate and use the light compound microscope
- Perform common laboratory tests for direct demonstration of microorganisms from clinical samples and interpret their findings.
- Prepare a smear and perform gram stain
- Prepare a smear and perform Ziehl-Neelsen stain for mycobacteria
- KOH preparation for identification of fungal elements.
- Wet mount preparations for demonstration of trophozoite, ova or cysts in fecal samples.
- Prepare and stain peripheral blood for screening microfilaria and malarial parasites.
- Wet preparation for Trichomonas vaginalis.
- Interpret the results of microbiological tests and to correlate the clinical manifestaitons with the etiological agents.
- Perform simple standard rapid tests for diagnosis of infectious diseases.

C) INTEGRATION

The student will be integrated with the knowledge of infectious diseases of national importance in relations to the clinical, epidemiological, therapeutic and preventive aspects.

I. GENERAL MICROBILOGY

S.NO	TOPICS
1.	Introduction and History of Microbiology
2.	Morphology of Bacteria – I
3.	Morphology of Bacteria – II
4.	Physiology of Bacteria
5.	Sterilisation
6.	Disinfection
7.	Culture Media
8.	Culture Methods

9.	Identification of Bacteria
10.	Bacterial Genetics – I
11.	Bacterial Genetics – II
12.	Microbial Pathogenicity (infection)

MICROBIOLOGY SYLLABUS

I. IMMUNOLOGY:

S.NO	TOPICS
1.	Structure and functions of immune system
2.	Immunity – I
3.	Immunity – II
4.	Antigen
5.	Antibodies – immunoglobulins
6.	Antigen antibody reactions –I
7.	Antigen antibody reactions – II
8.	Complement system
9.	Immune response
10.	Hypersensitivity –I
11.	Hypersensitivity – II
12.	Autoimmunity
13.	Immunodeficiency diseases
14.	Transplantation and tumor immunity
15.	Immunohaemetology

II. PARASITOLOGY

S.NO	TOPICS
1.	Introduction to parasitology& Entamoebia histolytica
2.	Nonpathogenic and opportunistic amoebae
3.	Intestinal,oral and genital flagellates
4.	Trypanosomes
5.	Leishmania
6.	Plasmodium –I
7.	Plasmodium – II
8.	Toxoplasma gondii & Cryptosporidium
9.	Balantidium coil
10.	Introduction to helmints, Taenia saginata and Taenia solium
11.	Hymenolepsis nana and diphylobothrium latum
12.	Echinococcus granulosus
13.	Schistosomes
14.	Fasciola buski
15.	Clonorchis sinensis & paragonimus westermani

III. SYSTEMATIC BACTERIOLOGY

S.NO	TOPICS
1.	Staphylococcus
2.	Streptococcus
3.	Pneumococcus
4.	Neisseria
5.	Corynebacterium
6.	Bacillus
7.	Clostridium - I
8.	Clostridium - II
9.	Nonsporing anaerobes
10.	Enterobacteriaecae- E.coli.Klebsiella
11.	Proteus and pseudomonas
12.	**Salmonella -I**
13.	**Salmonella - II**
14.	**Shigella**
15.	Vibrio
16.	Yersinia,Pasturella
17.	Haemophilus
18.	Bordetella

19.	Brucella
20.	Mycobacterium tuberculosis - I
21.	Mycobacterium tuberculosis - II
22.	Mycobacterium leprae
23.	Atypical mycobacteria
24.	**Spirochetes – I (Treponema)**
25.	Spirochetes – II (Borrelia & leptospira)
26.	Mycoplasma, Actinomycetes
27.	**Miscellaneous bacteria -I**
28.	**Miscellaneous bacteria -II**
29.	**Rickettsiaceae**
30.	**Chlamydia**

IV. VIROLOGY

1.	General properties of viruses – I
2.	Gneral properties of viruses – II
3.	Virus – host interactions
4.	Bacteriophage
5.	Poxviruses and Adenoviruses
6.	Herpes viruses
7.	Picornaviruses
8.	Orthomyxoviruses
9.	Paramyxoviruses
10.	Arboviruses – I
11.	Arboviruses – II
12.	Rhabdoviruses
13.	Hepatitis Viruses – I
14.	Hepatitis Viruses – II
15.	HIV – I
16.	HIV – II
17.	Oncogenic viruses
18.	Miscellaneous viruses

V. NEMATODES

1.	Introduction to nematodes and Trichinella spiralis
2.	Trichuris trichiura and Enterobius vermicularis
3.	Strongyloides stercoralis
4.	Ancyclostoma duodenale
5.	Ascaris lumbricoids
6.	Filarial nematodes – I
7.	Filarial nematodes – II
8.	Dracunculus medinensis
9.	Diagnostic procedures
10.	Stool examination
11.	Blood examination

VI. MEDICAL MYCOLOGY

1.	Introduction to mycology
2.	Superficial mycoses
3.	Superficial mycoses
4.	Systemic mycoses
5.	Opportunistic mycoses

VII. CLINICAL& APPLIED MICROBIOLOGY

1. Normal microbial flora of the human body
2. Sore throat & pneumoniae
3. Urinary tract infections
4. Diarrhoel diseases
5. Meningitis
6. Bacteremia,Septicemia & infective endocarditis
7. Pyrexia of unknown origin (PUO)
8. Hospital acquired infection
9. Antimicrobial sensitivity testing
10. Bacteriology of water,milk and air
11. Hospital waste management
12. Emerging bacterial infections & drug resistance
13. Emerging viral infectious diseases

14. Recent advances in diagnostic techniques in clinical microbiology.

PRACTICALS:

STAINING

- Grams stain
- Special stains – Acid fast staining

APPLIED EXERCISE

SYSTEMATIC - Identification of the pathogen from the given case history, staining property, cultural characters, biochemical and serological test.

IMMUNOLOG – Interpretation of the given immunological test

Agglutination – Slide & tube agglutination

Latex agglutination test – RA, CRP, ASO

Precipitation – RPR, Molecular methods

MYCOLOGY – Identification of the given fungus by cultutal morphology LCB mount

PARASITOLOGY – Stool examination for ova & cyst saline and iodine preparation

SPOTTERS – Identification and interpretation

BOOKS RECOMMENDED

Textbook of microbilogy – Ananthanaryanan and Jayaaaram panicker

Textbook of microbiology – C.P Baveja

Parasitology – (Protozoology, helminthology in relation to clinical medicine) -

K.D. Chatterjee

Medical Parasitology – Rajesh karyakarte & Ajit Damle

Medical Parasitology – D.R. Arora

Medical Parasitology – Panicker

Essential Immunology –Ivon M. Roitt

Medical Parasitology – Pareja

EXAMINTION EVALUATION – 400 MARKS

Theory – 100X2 : 200marks

Practical : 80marks

Viva : 20marks

Internal assessment : 100 (Theory 40 +practical 40, Record 20)

UNIVERSITY EXAMINATION

THEORY:

Two papers carrying 100marks each of 3 hours duration

Paper - I:

1. General Microbiology
2. Immunology
3. systematic bacteriology

Paper – II:

1. Virology
2. Mycology
3. Parasitiology
4. Applied Microbiology

PATTERN OF QUESTION PAPER:

Marks each paper – 100 marks

MCQ'S	=	20x1 = 20marks
Applied Questions	=	2X10 = 20marks
Short Answer Questions	=	12x5 = 60marks

		Total: = 100

Each paper will have 2 sections

PRACTICAL MARK DISTRIBUTION

Practical Mark: 80 Marks

Spotters	10 Marks
Staining:	
Gram staining	10marks
AFB staining	10marks
Stool examination	10marks
Identification of bacterial culture	15marks
Identification of fungus	10marks
Immunology	15marks
	80marks
Viva	20Marks

INTERNAL ASSESSMENT – MARK DISTRIBUTION

I.A. MARK – 100

Theory	=	40
Practical	=	40
Record notebook	=	20
Total:		100

PASS CRITERIA:

	MAXIMUM	**MINIMUM**
Theory (paper I &II)	200	100
Practical	80	40
Viva	20	-
Practical +Viva	100	50
Internal Assessment	100	40
Grand Total	400	200

PHARMACOLOGY

PHARMACOLOGY

GOAL:

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

OBJECTIVES:

A. KNOWLEDGE

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

1. Describe the pharmacokinetics and pharmaccodynamics of essential and commonly used drugs.
2. List the 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.
   I) Individual needs
   II) Mass therapy under national health program
4. Describe the pharmacokinetic basis, clinical presentation, diagnosis and management of common poisonings.
5. List the drugs of addiction and recommend the management.
6. Classify enviornmental and occupational pollutants and state the management issues.
7. Indicate causations in prescription of drugs in special medical situations such as pregnancy, lactation, ingancy and old age.
8. Integrate the concept of rational drug therapy in clinical pharmacology
9. State the principles underlyiing the concept of 'Essential Drugs'
10. Evaluate the ethics and modalities involved in the development and introduction of new drugs.

SKILLS:

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

1. Prescribe drugs for common ailments

2. Recognise adverse reactions and interactions of commonly used drugs
3. Observe experiments designed for study of effects of drugs, bioassay and interpretation of the experimental data.
4. Scan information on common pharmaceutical preparations and critically evaluate drug formulations.

INTEGRATION:

Practical knowledge of use of drugs in clinical departments and pre clinical departments.

PHARMACOLOGY – SYLLABUS

PAPER: I

1. General Pharmocological principles:
2. Introduction, Routes of drug administration
3. Pharmacokinetics: Membrane transport, absorption and distribution of drugs
4. Pharmacokinetics, metabolism and excretion of drugs, kinetics of elimination
5. Pharmacodynamics: mechanism of drug action, receptor pharmacology
6. Aspects opf pharmacotherapy, clinical pharmacology and drug development.
7. Adverse drug effects

I. Drugs acting on autonomic nervous system

Cholinergic system and drugs

1. Anticholinergic drugs and drugs acting on autonomic ganglia
2. Adrenergic system and drugs
3. Antiadrenergic drugs and drugs for glaucoma

II. Autocoids and related drugs:

1. Histamine and antihistamine
2. 5-Hydroxy tryptamine, its antagonists and drug therapy of migraine
3. Prostaglandins,Leukotrines (Eicosanoids) and Platelet activation factor
4. Non- steroidal anti- inflammatory drugs and antipyretics – analgesics
5. Anti-Rheumatoid and anti-Gout drugs

III. Respiratory system drugs:

1. Drugs for cough and bronchial asthma

IV. Drugs acting on peripheral nervous system
    1. Skeletal muscle relaxant
    2. Local anaesthetics

V. Drugs acting on central nervous system
    1. General anesthetics
    2. Ethyl and methyl alcohols
    3. Sedative – Hypnotics
    4. Antiepileptic drugs
    5. Anti-Parkinsonian drugs
    6. Drugs used in mental illness: Antipsychotics and antimanic drugs
    7. Drugs used in mental illness: Antidepressant and antianxiety drugs
    8. Opioid analgesics amd antagonists
    9. CNS stimulants and cognition enhancers

VI. Cardiovascular Drugs
    1. Drugs affecting Renin angiotensin system and plasma kinins
    2. Cardia Glycosides and drugs for heart failure
    3. Anti arrhythmic drugs
    4. Anti angina and other anti-ischemic drugs
    5. Antihypertensive drugs
    6. Pharmacology of shock: plasma expanders

VII. Drug acting on kidney
    1. Diuretics
    2. Antidiuretics

VIII. Drugs affecting blood and blood formation
    1. Haematinics and Erythropoietin
    2. Drugs affecting coagulation,bleeding and thrombosis
    3. Hypolipidaemic drug

PAPER. II

I. Hormones and related drugs
    1. Anterior pituitary hormones
    2. Thyroid hormones and its inhibitors
    3. Insulin, Oral hypoglycemic drugs and glucagon
    4. Corticosteroids
    5. Androgens and drugs for erectile dysfunction
    6. Oxytocin and other drugs acting on uterus
    7. Drugs affecting calcium balance

II. Gastrointestinal drugs
    1. Drugs for peptic ulcer
    2. Drugs for emesis,reflux and digestive disorders
    3. Drugs for constipation and diarrhoea

III. CHEMOTHERAPY
    1. Sulfonamides, cotrimoxazole and Quinolones
    2. Beta lactam antibiotics
    3. Tetracyclines and Chloramphenicol
    4. Aminoglycosides
    5. Macrolides, Lincosamide,Glycopeptide and other antibacterial antibiotics
    6. Antitubercular drugs
    7. Antileprotic drugs
    8. Antifungal drugs
    9. Antiviral drugs
    10. Antimalarial drugs
    11. Antiamoebic and antiprotozoal drugs
    12. Antihelmintic drugs

IV. Chemotherapy of Neoplastic diseases
    1. Anticancer drugs

V. Miscellaneous drugs
    2. Immunosuppressants, Gene therapy

3. Drugs acting on skin and mucous membranes
4. Antiseptics, Disinfectants and Ectoparasiticides
5. Chelating agents
6. Vitamins
7. Vaccines and Sera
8. Drug interaction

UNIVERSITY EXAMINATION

THEORY:

2 Papers of 100 marks each and 3 Hours Duration.

PATTERN OF QUSTION PAPER:

Marks: each paper – 100marks

MCQs	=	20x1 = 20marks
Applied questions	=	2x10 = 20marks
Short Answer questions	=	12x5 =60marks
Total	=	100marks

Each paper will have 2 sections – Section A & Section B.

PRACTICAL MARK DISTRIBUTION

Practical Mark : 80 Marks

Practical –I -90mins

1. Prescription : 10marks
2. Prescription audit/critical evaluation of drug formulation : 10marks
3. Clinical problem solving excercises : 10marks

(Therapy oriented problems of drug adverse reaction and Interaction of commonly used drugs)

4. Dosage calculation including pharmaco-economic problems/ Spotters : 10marks

PRACTICAL – II– 90MINS

1. Experiment design for study of effects of drugs : 20marks
2. Qualitative/Quantitative experimental pharmacology charts : 10marks
3. Clinical pharmacology charts :10marks

Viva : 20marks

Total: 100marks

INTERNAL ASSESSMENT – MARK DISTRIBUTION

I.A MARK – 100

Theory	=	40
Practical	=	40
Record notebook	=	20
Total		100

PASS CRITERIA:

	MAXIMUM	MINIMUM
Theory (paper I &II)	200	100
Practical	80	40
Viva	20	-
Practical +Viva	100	50
Internal Assessment	100	40
Grand Total	400	200

FORENSIC MEDICINE AND TOXICOLOGY

FORENSIC MEDICINE-

1. 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 conneted medicolegal prblems. He/she acquires knowledge of law in relation to medical practice, medical negligence and respect for codes of medical ethics.

2. OBJECTIVES:

A. KNOWLEDGE

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

a) Identify the basic medicolegal aspects of hospital and general practice.
b) Define the medicolegal responsibilities of a general physician while rendering community service either in a rural primary health centre or an urban health centre.
c) Appreciate the physician's responsibilities in criminal matters and respect for the codes of medical ethics.
d) Diagnose, manage and identify also legal aspects of common acute and chronic poisonings.
e) Describe the medicolegal aspects and findings of post-mortem examination in case of death due to common unnatural conditions & poisionings.
f) Detect occupational and environmental poisioning. Prevention and epidemiology of common poisioning and their legal aspects particularly pertaining to Workmen's compensation Act.
g) Describe the general principles of analytical toxicology

3. SKILLS:

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

   a) Make obsevations and logical inferences in order to initiate enquiries in criminal matters and medicolegal problems.
   b) Diagnose and treat common emergencies in poisoning and manage chronic toxicity
   c) Make observations and interpret findings at postmorterm examination.
   d) Observe the principles of medical ethics in the practise of his profession

4. 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 discipline will provide scientific basis of clinical toxicology e.g. medicine, pharmacology etc.

FORENSIC MEDICINE &TOXICOLOGY – SYLLABUS:

1. **Medical jurisprudence:**

   Legal proceducres, inquests, Subpoena –conduct money procedure of criminal trial, recording of evidence, types of evidence, types of witness and various courts in India.

2. **Medical law and ethics**:

   Indian medical council, State medical council, functions and powers, duties of registered medical practitioners, infamous conduct, professional negligence, professional secrecy, privileged communication.

   Doctrine of rea ispa loquitor, contributory negligence

   Vicarious responsibility, consent, consumer protection act.

3. **Identification:**

   To establish the identity in the dead and living: - Race, Religion, Sex, Age, stature, complexion and features, external familarities, anthropometry

4. **Death and its medico legal aspects (Forensic Thanatology):**

   Pathophysiology of death, classification and medico legal apects. Changes following death and their medico legal significance, Estimation of postmortem interval. Sudden death, entomology of cadaver.

5. **Asphyxial Deaths:**

   Classification, types, hanging, strangulation, throttling, gagging, smothering, drowning, sexual asphyxia

6. **Mechanical Injuries:**

   Classification, Mechanism of wound production,types-Abraion, contusions, incised wounds, chop wounds, stab wounds, lacerations, medico legal importance.

   Injuries by firearms –classification of firearms, characteristics of firearm injuries, Transportation and Bomb explosion injuries.

   Regional injuries, Medico legal aspects of wounds

7. **Death due to electricity**:

   Types of fatal electrocution, mechanism of death, autopsy findings, joule burn, judicial electrocution, lighning and mechanism of injury by it.

8. **Thermal Deaths**:

   Classification of burns, rule of nine, age of burn injury, autopsy findings, antemortem and postmortem differentiation of burns, scalds and their medical aspects, hypothermia.

   a) Anaesthetic and operative deaths
   b) **Impotence and sterility**:

      Definition, causes, medico legal significance

      Sterilization and artificial insemination – medico legal importance
   c) **Virginity, pregnancy, delivery**:

      Definition, diagnosis, medico – legal importance

      Surrogate motherhood.
   d) **Sexual offences**:

Rape – examination of victim and the accused

Unnatural sexual offences – types

Sexual perversion – types

9. **Abortion:**

   Definition- classification, methods of procuring abortion, complications, medical termination of pregnancy act.

10. I**nfanticide**:

    Definition – classification, methods of procuring abortion, complications, medical termination of pregnancy act.

11. Examination of blood stains, blood grouping, medico legal aspects, DNA profiling

12. **Forensic psychiatry**: -

    classification of unsoundness of mind and medidco legal aspects. Delusions, Hallucination, Illusions, Impulse,Obsession, Delirium,Restraint of the insane,civil and criminal responsibility.

13. **Medico- legal autopsy:**

    Procedure for external, internal examination, techniques, post mortem record,examination of bones. Exhumation – procedure.

14. **Toxicology:**

    Classification of poisons

    Diagnosis of poisoning in the living and dead

    Duties of medical practitioner in suspected cases of poisoning.

15. **Treatment of poisoning:**

    Types of poisons –corrosives, metalic, insecticides, organic irritant poisons, somniferous poisons, inebriants, deliriants,spinal poisons, food poisoning, cardiac poisons, asphyxiants,tear gases,drug dependence and addiction.

UNIVERSITY EXAMINATION

THEORY:

One paper of 3 hours duration and 100marks

PATTERN OF QUESTION PAPER:

Marks: one paper – 100 marks

MCQ'S	=	20x1 = 20marks
Applied Questions	=	2X10 = 20marks
Short Answer Questions	=	12x5 = 60marks
Total	=	100marks

PRACTICAL MARK DISTRIBUTION

Practical Mark: 80 marks

PRACTICAL –I **Marks: 30**

One of the following Exercises:

1. Age estimation by dental examination
2. Age estimation by radiological examinatin
3. Exmination of the case of drunkenness and issue of drunkeness certificate
4. Examination of given cluster of bones and issue mof medico legal certificate
5. Examination of injuries and issue of wound certificate

PRACTICAL II:	**Marks**
1. Fetal examination and opinion	10
2. Viscera packing	10
3. Opinion on sexual offense	10
4. Spotters: 5x2	10
a. Pathology specimen	
b. Forensic specimen	
c. Instruments	
d. Toxixology seed	
e. Toxicology plant	
5. Photograph	10
Total	80

Viva 20Marks

INTERNAL ASSESSMENT – MARK DISTRIBUTION

I.A. MARK – 100

Theory	=	40
Practical	=	40
Record notebook	=	20

Total:		100

PASS CRITERIA:

	MAXIMUM	**MINIMUM**
Theory (paper I)	100	50
Practical	80	40
Viva	20	-
Practical +Viva	100	50
Internal Assessment	100	40
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Grand Total	300	150
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OTO - RHINOLARYNGOLOGY

OTO-RHINO-LARYNGOLOGY

GOAL:

The broad goal of the teaching of undergraduate students in Otorhinolaryngology is that the undergraduate student have acquired adequate knowledge and skills for optimally dealing with common disorders and emergencies and principles of rehabilitation of the impaired hearing.

OBJECTIVES

A. KNOWLEDGE

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

1. Describe the basic pathophysiology of common ENT diseases and emergencies.
2. Adopt the rational use of commonly used drugs, keeping in mind their adverse reactions.
3. Suggest common investigative procedures and their interpretation.

B. SKILLS

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

1. Examine and diagnose common ENT problems including the pre-malignant and malignant disorders of the head and neck.
2. Manage ENT problems at the first level of care and be able to refer whenever necessary.
3. Assist/carry out minor surgical procedures like ear syringing, ear dressings, nasal packing etc.
4. Assist in certain procedures such as tracheostomy, endoscopies and removal of foreign bodies.

C. INTEGRATION:

The undergraduate training in ENT will provide an integrated approach towards other disciplines especially neurosciences, ophthalmology and general surgery.

COURSE CONTENTS:

EAR

1. Surgical anatomy of ear.
2. Physiology of hearing and vestibular function.
3. Symptomatology and clinical examination and management of ear diseases.
4. Diseases of external ear:
    - Perichondritis, external otitis, foreign bodies and pre-auricular sinuses.
5. Diseases of middle ear.
    - Acute and chronic otitis media, otosclerosis.
6. Diseases of inner ear:
    - Menieres disease, BPPV, Acoustic Neuroma and Labyrinthitis.
7. Complications of middle ear diseases.
8. Deafness:
    - Types and causes, Deaf mutism.
9. Principles of ear surgeries.
10. Facial nerve paralysis:
    - Causes and management.

NOSE AND PARANASAL SINUSES

1. Surgical anatomy and physiology of Nose and PNS.
2. Symptomatology, clinical examination and management of nose diseases.
3. Diseases of external nose:
    - Rhinophyma, Deformities.
4. Diseases of nasal cavity:
    - Acute and chronic Rhinitis, Foreign bodies, Rhinolith, Granulomatous Disease of nose, Atrophic Rhinitis, CSF Rhinorrhoea.
5. Diseases of nasal septum:
    - Septal deviation, perforation, hematomas and abscess.
6. Epistaxis:
    - Causes and management.
7. Allergic Rhinitis and vasomotor rhinitis.

8. Acute and chronic sinusitis.
9. Nasal polyposis.
10. Benign and malignant tumor of nose and PNS.

THROAT

1. Symptomatology, clinical features and management of throat diseases.
2. Pharynx:

   Nasopharynx – adenoids, juvenile nasopharyngeal angiofibroma.

   Oropharynx – acute and chronic tonsillitis, acute and chronic pharyngitits, membranous lesions of tonsils.

   Hypopharynx – plummer Vinson syndrome.

   Dysphagia : causes and management.

   Benign and malignanat lesions of pharynx.
3. Larynx:

   Acute and chronic laryngitis, hoarseness of voice, stridor, differential diagnosis of respiratory obstructions, vocal cord polyps and nodule.

   Benign and malignant lesions of larynx.
4. Neck:

   Neck swelling, diseases of salivary glands.

   Tracheostomy – indications and complications.

   Diseases of oesophagus: strictures, malignancy and foreign bodies, airway foreign bodies.

UNIVERSITY EXAMINATIONS

Theory:

2 Papers of 100 marks each and 3 Hours Duration.

PATTERN OF QUESTION PAPER:
Theory paper – 100 marks (one paper)

MCQs	=	20 X 1 = 20 Marks
Applied Questions	=	2 X 10 = 20 Marks
Short Answer Questions	=	12 X 5 = 60 Marks

Total: 100 Marks

Theory paper will have 2 sections.

PRACTICAL MARK DISTRIBUTION

Practical mark: 80

Long Case	= 40
Short Case	= 20
Spotter	= 20

Total: 80

Viva = 20

INTERNAL ASSESSMENT – MARK DISTRIBUTION

I.A. MARK – 100

Theory	= 40
Practical	= 40
Record notebook/ Log Book & Assignment	= 20

Total: 100

Pass criteria:

THEORY	MAXIMUM	MINIMUM
1 Paper	100	50
Practical	80	40
Viva	20	-
Practical + Viva	100	50
Internal Assessment	100	40
GRAND TOTAL:	300	150

OPHTHALMOLOGY

OPHTHALMOLOGY

GOAL:

The broad goal of the teaching of students in ophthalmology is to provide such knowledge and skills to the students that shall enable him to practice as a clinical and as a primary eye care physician and also to function effectively as a community health leader to assist in the implementation of National Programme for the prevention of blindness and rehabilitation of the visually impaired.

OBJECTIVES

A. KNOWLEDGE

At the end of the course, the student should have knowledge of:

a. Common problems affecting the eye:
b. Principles of management of major ophthalmic emergencies
c. Main systemic diseases affecting the eye
d. Effects of local and systemic diseases on patient's vision and the necessary action required to minimise the sequalae of such diseases;
e. Adverse drug reactions with special reference to ophthalmic manifestations;
f. Magnitude of blindness in India and its main causes;
g. National programme of control of blindness and its implementation at various levels
h. Eye care education for prevention of eye problems
i. Role of primary health centre in organization of eye camps
j. Organization of primary health care and the functioning of the ophthalmic assistant.
k. Integration of the national programme for control of blindness with the other national health programmes;
l. Eye bank organization

B. **SKILLS**:

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

a. Elicit a history pertinent to general health and ocular status;
b. Assist in diagnostic procedures such as visual acuity testing, examination of eye, Schiotz tonometry, Staining for Corneal pathology, confrontation perimetry, Subjective refraction including correction of presbyopia and aphakia, direct ophthalmoscopy and conjunctival smear examination and Cover test.
c. Diagnose and treat common problems affecting the eye;
d. Interpret ophthalmic signs in relation to common systemic disorders;
e. Assist/observe therapeutic procedures such as subconjunctival injection, Corneal/Conjunctival foreign body removal, Carbolic cautery for corneal ulcers, Nasolacrimal duct syringing and tarsorraphy;
f. Provide first aid in major ophthalmic emergencies;
g. Assist to organise community surveys for visual check up;
h. Assist to organise primary eye care service through primary health centres;
i. Use effective means of communication with the public and individual to motivate for surgery in cataract and for eye donation;
j. Establish rapport with his seniors, colleagues and paramedical workers, so as to effectively function as a member of the eye care team.

C. INTEGRATION

The undergraduate training in Ophthalmology will provide an integrated approach towards other disciplines especially neurosciences, Otorhino-laryngology, General Surgery and Medicine.

SYLLABUS

1. Conjunctival infection, allergy, pterygium, xerophthalmia.
2. Aetiology, clinical features, complications and treatment of corneal ulcers, keratomalacia and other sclera and corneal inflammations.
3. Eye donation, eye bank, cornea transplant.

4. Anatomy of eye lids and its disorders.
5. Anatomy of lacrimal passage and obstructive disorders.
6. Classification of cataract, investigation, management and complication of cataract surgery.
7. Classification, aetiology, clinical features, complications and management of various forms of uveitis.
8. Classification, aetiology, clinical features and management of various glaucomas.
9. Differential diagnosis of red eye.
10. Optics and refractive errors.
11. Eye injuries.
12. Etiology, fundus picture, management of papilloedema and optic neuritis.
13. Proptosis.
14. Retinal changes in HTN, DM, and AIDS.
15. Ocular manifestation of systemic diseases including diabetes, hypertension, tuberculosis, leprosy, anaemia and pregnancy induced hypertension.
16. Types of blindness and their causes.
17. Ocular side effects of systemic drugs.
18. Objective of national programmes of prevention and control of blindness and trachoma control programme.
19. Retinal vascular occlusion, inflammation, detachmu and degeneration.
20. Aetiology, clinical features and principals of treatment of vitreous diseases eg. Hemorrhage, degeneration, liquefaction, endophthalmitis.
21. Ocular manifestations of common neurological disorders.
22. Aetiology, symptoms, diagnosis and principles of treatment of strabismus.
23. Recent advances in ophthalmology – types and scope of lasers and imaging procedures, intraocular lens implantation.

UNIVERSITY EXAMINATIONS

Theory:

2 Papers of 100 marks each and 3 Hours Duration

PATTERN OF QUESTION PAPER:

Marks: each paper – 100 marks

MCQs	=	20 X 1 = 20 Marks
Applied Questions	=	2 X 10 = 20 Marks
Short Answer Questions	=	12 X 5 = 60 Marks

Total: 100 Marks

Each paper will have 2 sections.

PRACTICAL MARK DISTRIBUTION:

Practical mark: 80

Long Case	= 40
Short Case (15 X 2)	= 30
Spotter (10 X 1)	= 10

Total: 80

Viva = 20

Instrument	= 5
Pharmacology & Drugs	= 5
Refraction	= 5
Community Ophthalmology & Systemic Opthalmology	= 5

20

INTERNAL ASSESSMENT – MARK DISTRIBUTION
I.A. MARK – 100

Theory	= 40
Practical	= 40
Record notebook/logbook	= 20
Assignment	
	Total: 100

Pass criteria:

THEORY	MAXIMUM	MINIMUM
1 Paper	100	50
Practical	80	40
Viva	20	-
Practical + Viva	100	50
Internal Assessment	100	40
GRAND TOTAL:	300	150

COMMUNITY MEDICINE

COMMUNITY MEDICINE

Teaching of Community Medicine is started in Phase – I –Pre-clinical course (60hrs). The teaching will continue during Phase. II & III. The detailed syllabus is outlined below.

I. GOAL:

The broad goal of the teaching of undergraduate students in Community Medicine is to prepare them to function as community and first level physicians in accordance with the institutional goals.

II. OBJECTIVES

1. **KNOWLEDGE**

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

- Describe the health care delivery system including rehabilitation of the disabled in the country;
- Describe the National Health Programmes with particular emphasis on maternal and child health programmes, family welfare planning and population control.
- List epidemiological methods and describe their application to communicable and non-communicable diseases in the community or hospital situation.
- Apply biostatistical methods and techniques;
- Outline the demographic pattern of the country and appreciate the roles of the individual, family, community and socio-cultural milieu in health and disease.
- Describe the health information systems.
- Enunciate the principles and components of primary health care and the national health policies to achieve the goal of 'Health for All'.
- Identify the environmental and occupational hazards and their control.
- Describe the importance of water and sanitation in human health.

- ❖ To understand the principles of health economics, health administration, health education in relation to community

III. SKILLS

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

1. Use epidemiology as a scientific tool to make rational decisions relevant to community and individual patient intervention.
2. Collect, analyse, interpret and present simple community and hospital based data.
3. Diagnose and manage common health problems and emergencies at the individual, family and community levels keeping in mind the existing health care resources and in the context of the prevailing socio-cultural beliefs.
4. Diagnose and manage maternal and child health problems and advise a couple and the community on the family planning methods available in the context of the national priorities.
5. Diagnose and manage common nutritional problems at the individual and community level.
6. Plan, implement and evaluate a health education programme with the skill to use simple audio-visual aids.
7. Interact with other members of the health care team and participate in the organisation of health care services and implementations of national health programmes.

IV. INTEGRATION ;

Develop capabilities of synthesis between cause of illness in the environment or community and individual health and respond with leadership qualities to institute remedial measures for this.

DETAILED SYLLABUS

SYLLABUS – THEORY PAPER – I

CHAPTER I. EVOLUTION OF COMMUNITY MEDICINE & BASIC CONCEPTS IN HEALTH AND DISEASE:

1. History background: hygiene, public health, preventive medicine, social medicine & community medicine.
2. Definition of health; appreciation of health as a relative concept; determinants of health, dimensions of health, ecology of health, positive health.
3. Characteristics of agent, host and environmental factors in health and disease and the multifactorial etiology of disease, spectrum of health and disease.
4. Various levels of prevention with appropriate examples.
5. Indices used in measurement of health.
6. Difficulties in measurement of health.

CHAPTER II. DEMOGRAPHY:

1. Definition of demography.
2. Stages of the demographic cycle and their impact on the population.
3. Definition, calculation and interpretation of demographic indices like birth rate, death rate, growth rate, and fertility rates.
4. Health situation in India: demography, mortality and morbidity profile and the existing facilities in health services.

CHAPTER III. PRIMARY HEALTH CARE:

1. Salient features of the national health policy:
    a) Provision of medical care;
    b) Primary health and health for all.
    c) Health manpower development.
    d) Planned development of health care facilities;
    e) Encouragement of indigenous system of medicine.

f) Recommendations of health committees.

2. Process of health care delivery in India.
3. The health system and health infrastructure at center, state and district levels.
4. The inter relationship between community development block and primary health center.
5. The organization, functions and staffing pattern of community health centers, primary health centers and sub-centers.
6. The job descriptions of health supervisor (male and female) health workers; village health guide, anganwadi workers, traditional birth attendants.
7. The activities of the health team at the primary health center.

CHAPTER IV. SOCIAL AND COMMUNTIY HEALTH:

1. Conduct clinic-social evaluation of the individual in relation to social, economic and cultural aspects; educational and residential background; attitude towards health, diseases health services; the individual's family and to the community.
2. Assessment of barriers to good health, to recovery from sickness and to leading a socially and economically productive life.
3. Development of a good doctor – patient relationship.
4. Identification of social factors related to health and disease in the context of urban and rural societies.
5. Impact of urbanization on health and disease.
6. Planning, collecting, analyzing and interpreting data to reach a community diagnosis. Planning an intervention programmes with community participation based on the community diagnosis.

CHAPTER V. HEALTH EDUCATION:

1. Effective communication with individuals, family and community using tools and techniques of information, education and communication.
2. Barriers to effective communication.
3. Principles, methods and evaluation of health education.
4. Methods of health education – their advantage and disadvantages.

5. Selection and use of appropriate media (simple audiovisual aids) for affective health education.
6. Identification of missed opportunities for implementation of health education activities for individual, family and the community.

CHAPTER VI. ENVIRONMENT & HEALTH:

1. Introduction to environment.
2. Sources of water pollution.
3. Water purification. Water quality, WHO – standers, surveillance of drinking water quality. Horrock's Test. Water sampling.
4. Air pollution. Indicates of thermal comfort. Monitoring air pollution. Control and prevention of air pollution.
5. Standards of ventilation & good lighting.
6. Noise pollution and control.
7. Radiation sources and control.
8. Air temperature measurement. Heat stress indices, effects and control, cold stress. Humidity precipitation.
9. Housing standards.
10. Solid & liquid wastes disposal, modern sewage treatment.

CHAPTER VII. PUBLIC HEALTH ENTOMOLOGY:

1. Role of vectors in the causation of disease.
2. Indentifying features of and mode of transmission of vector borne diseases.
3. Methods of vector control with advantages and limitations of each.
4. Mode of action, dose and application cycle of commonly used insecticides.
5. Steps of management of a case of insecticide toxicity.

CHAPTER VIII. NUTRITION & HEALTH:

1. Common sources of various nutrients and special nutritional requirement according to age, sex, activity & physiological condition.

2. Nutritional assessment of individual, family and the community by selecting and using appropriate methods such as anthropometrics, clinical , dietary, laboratory techniques.
3. Compare recommended daily allowances (RDA by ICMR) of individuals and families with actual intake.
4. Plan and recommend a suitable diet for the individuals and families bearing in mind local availability of foods, economic status etc.
5. Common nutritional disorders: protein energy malnutrition, vit. A Deficiency, Anaemia, Iodine deficiency disease, flurosis, food toxins – diseases and their control and management.
6. National programmes in nutrition.

CHAPTER IX. PRINCIPLES OF EPIDEMIOLOGY:

1. Aims of epidemiology.
2. Basic measurements in epidemiology.
3. Epidemiological methods.
4. Association and causation of disease.
5. Uses of epidemiology.
6. Investigation of epidemic.
7. Diseases prevention and control.
8. Epidemiology problems.

CHAPTER X. SCREENING FOR DISEASES:

1. Concept of screening.
2. Uses of screening.
3. Criteria for screening.
4. Accuracy and clinical value of diagnostic and screening test – sensitivity, specificity, predictive value, problem of borderline values.

CHAPTER XI. MEDICAL STATISTICS:

1. Health information systems.
2. Elementary statistical methods.

3. Statistical averages.
4. Measures of dispersion.
5. Chi – square test.
6. Correlation and regression.
7. Statistical problems.

CHAPTER XII. FAMILY WELFARE:

1. Reasons for rapid population growth in India.
2. Need for population control measures and the national population policy.
3. Different family planning methods and their advantages and shortcoming. Recent advances in contraception.
4. Motivating a couple to select the appropriate family planning methods.
5. Medical termination of pregnancy act.
6. National family welfare programmes.

CHAPTER XIII. EPIDEMIOLOGY OF SPECIFIC DISEASES:

1. Epidemiology of communicable diseases:

   Eruptive fevers – smallpox, chickenpox, measles, rubella, mumps, influenza, diphtheria, whooping cough, meningococcal meningitis, acute respiratory infections, SARS, tuberculosis, poliomyelitis, viral hepatitis, cholera, acute diarrhoeal diseases, typhoid fever, food poisoning, amoebiasis, ascariasis, hookworm infection, dracunculiosis, dengue syndrome, malaria, filariasis, rabies, yellow fever, Japanese encephalitis, KFD, brucellosis, leptospirosis, plague, human salmonellosis, ricketsial zoonoses, scrub typhus, Q fever, taeniasis, hydatid disease, leishmaniasis, trachoma, tetanus, leprosy, STD, yaws and AIDS, I.B. epidemiology of chronic and noncommunicable disease: cardiovascular disease, coronary heart disease, hypertension, stroke, rheumatic heart disease, cancer, diabetes, obesity, blindness, accidents and injuries.
2. Epidemiology of chronic and noncommunicable diseases: cardiovascular diseases, coronary heart disease, hypertension, stroke, rheumatic heart diseases, cancer diabetes, obesity, blindness, accidents and injuries.

3. Epidemiology of emerging and reemerging diseases.
4. Extent of the problem, epidemiology and nature history of the disease.
5. Relative public health importance of particular diseases in a given area.
6. Influence of social, cultural and ecological factors on the epidemiology of the disease.
7. Control of communicable and non-communicable disease.
    a. Diagnosing and treating a case and in doing so demonstrate skills in:
        - ❖ Clinical methods.
        - ❖ Use of essential laboratory techniques.
        - ❖ Selection of appropriate treatment regimes.
        - ❖ Follow – up of cases.
    b. Principles of planning, implementing and evaluating control measures for the diseases at the community level bearing in mind the relative importance of the disease.
8. Institution of programmes for the education of individual and communities.
9. Investigating a disease epidemic.
10. Principles of measures to control a disease epidemic.
11. Level of awareness of causation and prevention of disease amongst individuals and communities.

CHAPTER XIV. MATERNAL AND CHILD HEALTH:

1. Need for specialized services for these groups.
2. Magnitude of morbidity and mortality in these groups in a given area.
3. Local customs and practices during pregnancy, childbirth and lactation.
4. Concepts of 'high risk' and 'MCH packages' child survival and safe motherhood, integrated child development scheme and other existing regional programme.
5. Under – 5: morbidity, mortality, high risk and care.
6. Monitoring of growth and development and use of road to health chart.
7. Organization, implementation and evaluation of programmes for mother and children as per national programme guidelines; supervising health personnel;

maintaining records; performing a nutritional assessment; promoting breast feeding.

SYLLABUS – THEORY PAPER: II

CHAPTER XV. GENETICS AND COMMUNITY HEALTH:

1. Basic principles of genetics.
2. Chromosomal disorders.
3. Genetic predisposition in common disorders.
4. Advances in molecular genetics.
5. Preventive and social measures – eugenics & euthenics, genetic counseling.
6. Early diagnosis, treatment and rehabilitation.

CHAPTER XVI. SCHOOL HEALTH AND ADOLECENT HEALTH:

1. Objectives of the school health programme.
2. Activities of the programme like carrying out periodic medical examination of the children and the teachers.
3. Immunization of the children in the school.
4. Health education.
5. Mid day meals.
6. Participation of the teachers in the school health programme including maintenance of records.
7. Defining healthful practices.
8. Early detection of abnormalities.
9. Care of the adolescent girl and boys.

CHAPTER XVII. COMMUNITY GERIATRICS:

1. Common diseases of the elderly.
2. Prevention of degenerative diseases – role of exercise, nutrition, life style, etc.
3. Osteoporosis and arthrosis – effects of immobility – prevention of contractures and bed sores.
4. Economic and psychosocial needs of the ages.

5. Care of elderly in organized and unorganized sectors.
6. Role of health visitor and social worker.
7. Social problems in the elderly – joint family; day care center and day hospital; home for the aged – care given.

CHAPTER XVIII. MENTAL HEALTH:

1. Importance of mental health.
2. Types of mental illness and causes.
3. Preventive aspects.
4. Mental health services.
5. Alcoholism, drug dependence.

CHAPTER XIX. HEALTH PLANNING IN INDIA:

1. Health care system.
2. Levels of health care.
3. Primary health care in India.
4. PHC & community health care.
5. Health for all goals.
6. Health problems of India.
7. National health policy.
8. Health insurance.
9. Health planning in India.

CHAPTER XX. PUBLIC HEALTH ADMINISTRATION & MANAGEMENT:

1. Explain the terms: public health, public health administration, and regionalization, comprehensive medical care, delivery of health care, planning, management, and evaluation.
2. Salient features of the national health policy.
    a. Provisional of medical care.
    b. Primary health care and health for all.
    c. Health manpower development.
    d. Planned development of health care facilities.

e. Encouragement of indigenous systems of medicine.
f. Recommendations of health committees.

3. Process of health care delivery in India.
4. Management techniques: define and explain principles of management. Explain the three broad functions of management (planning, implementation and evaluation) and how they relate to each other.
5. Appreciate the need for international health regulation and disease surveillance.
6. Constitutional provisions for health in India: enumerate the three major divisions of responsibilities and functions (concerning health) of the union and the state governments.

CHAPTER XXI. OCCUPATIONAL HEALTH:

1. Relate the history of symptoms with the specific occupation including agriculture.
2. Employees stat insurance scheme.
3. Identification of the physical, chemical and biological hazards to which workers are exposed while working in a specific occupational diseases.
4. Diagnostic criteria of various occupational diseases.
5. Preventive measures against these diseases including accident prevention.
6. Various legislations in relation to occupational health.

CHAPTER XXII. URBAN HEALTH:

1. Common health problems (medical, social, environmental economic, psychological) of urban dwellers – health problems due to urbanization & industrialization.
2. Organization of health services for slum dwellers.
3. Organization of health services in urban areas.

CHAPTER XXIII. ESSENTIAL MEDICINE AND COUNTERFEIT MEDICINES:

1. WHO model list of essential medicine.
2. Monitoring medicine safety and pharmacovigilance.
3. Counterfeit medicine, site.
4. Quality control in drug sector in India.

CHAPTER XXIV. INTERNALTIONAL HEALTH SYSTEMS:

1. Historical development of health organization.
2. Appreciate the role of national and international voluntary agencies in health care delivery.
3. Health work of bilateral agencies.
4. Nongovernment & other voluntary agencies.
5. WHO & U.N. agencies.
6. International health regulations.
7. International classifications of diseases.

CHAPTER XXV. MEDICAL ETHICS & HEALTH LEGISLATION SALIENT PROVISIONS OF OTHER ACTS ON HEALTH:

1. Hippocratic oath.
2. Physician's IMA oath.
3. Provisions of T.N. public health Act 1939.
4. The preconception & pre – Natal diagnostic techniques Act 2000.
5. The prevention of food adulteration Act 1954.
6. The Birth & Death registration Act 1969.
7. The ESI Act 1948.
8. The MTP Act 1971
9. The factories Act 1948.

CHAPTER XXVI. DISASTER MANAGEMENT:

1. Disaster Impact.
2. Disaster response.
3. Epidemiological surveillance and disease control.
4. Disaster preparedness.
5. Disaster mitigation.

CHAPTER XXVII. NATIONAL PROGRAMMES IN INDIA.

1. Epidemiological basis of national health programmes.

2. Policy guidelines of GOI under different National Heath Programmes.
3. Organizational set up under each programme.
4. Activities that are to be carried out under each programme.
5. Monitoring Indicators for each programme.

CHAPTER XXVIII. BIOMEDICAL WASTE MANAGEMENT:

1. Bio-medical waste (management and handling) rules 1998 of India.
2. Sources of health care waste.
3. Health hazards of health care waste.
4. Collection, storage & transportation of health care wastes.
5. Treatment & disposal technologies of health care wastes.

CHAPTER XXIX. HEALTH ECONOMICS:

1. Basic concepts.
2. Poverty line.
3. GDP & GNP.
4. Costs, CBA, CEA.
5. Budget.
6. Health Financing.
7. Cost of medical care.
8. Medical quality & medical audit.

SKILLS

SKILLS	ABLE TO DO INDEPENDENTLY	ABLE TO PERFORM UNDER GUIDANCE	ASSIST	OBSERVE
GENERAL SKILLS: **THE STUDENT SHOULD BE ABLE TO:** 1. Elict clinic-social history. Describe agent, host and environmental factors determining health and disease.	✓			
2. Indentify, prioritize and manage common health problem of community.	✓			

3. Apply elementary principles of epidemiology in carrying out simple epidemiological studies.	✓			
4. Work as a team member in rendering health care.	✓			
5. Carry out health promotion and education effectively in the community.	✓			
SKILLS IN RELATION TO SPECIFIC TOPIC: **1. COMMUNICATION:** • Should be well versed with the art of interviewing techniques to elicit the desired information.	✓			
• The student should be able to communicate effectively with family members at home, patients at clinics or at home; and community.	✓			
• Individuals, family or a group for health promotion and education, and also with peers.	✓			
2. TEAM ACTIVITY: • Work as an effective member of the team; in planning and carrying out field work like school health, conduct health camps etc.				✓
3. ENVIRONMENTAL SANITAION: • Able to assess environmental risk factors and suggest action plan.	✓			
• Able to collect water and stool sample for microbiological analysis.	✓			
• Able to identify insects of public health importance, able to use effective insecticides.	✓			
4. COMMUNICABLE AND NON-COMMUNICABLE DISEASE: • Eliciting clinic-social history and examination the patient for diagnosis and treatment**.**	✓			
• Assessing the severity and /or classifying dehydration in diarrhea, upper respiratory tract infection, dog bite, leprosy, classify tuberculosis (categorization) and STD.	✓			
• Fixing, staining and examining peripheral smear for malaria, sputum for AFB, hemoglobin estimation, urine and stool examination.	✓			
• Adequate and appropriate treatment and follow up of public health diseases	✓			

and of locally endemic diseases.				
• Advice regarding prevention and prophylaxis against common and locally endemic diseases.	✓			
• Use of proper screening methods in early diagnosis of certain diseases, applicable at primary care level.	✓			
• Able to detect outbreak in early, sport mapping, investigation of outbreak, notification of modifiable diseases.			✓	
• Surveillance skills development, calculating various health indicators and their interpretations.	✓			
5. REPRODUCTIVE AND CHILD HEALTH: • Antenatal – examination of women, application of at-risk approach in antenatal care.	✓			
• Intranatal care – conducting a normal delivery, referral indications.		✓		
• Postnatal – assessment of newborn and mother, promotion of Brest feeding, advice on weaning and on family planning.	✓			
• Immunization – able to immunize the eligible using desired routes, for providing vaccines.	✓			
• Contraception - able to advice appropriate contraceptive methods.	✓			
• Able to insert any intra uterine device (IUD)		✓		
6. STATISTICS: • Able to draw sample using simple sampling techniques.	✓			
• Apply appropriate test of significance.		✓		
• Calculation of various health indicators and presentation of data.	✓			
7. NUTRITION: • Conduct complete nutritional assessment of individual using clinical, anthropometric and diet survey tools.	✓			
• Ability to use and interpret road to health card.	✓			
• Advice appropriate balance diet and suggest and dietary modification.	✓			
• Nutritional promotion and education to specific group and related to specific				

nutritional diseases.				
8. OCCUPATION HEALTH: • Screening of workers for any occupation related health problem.			✓	
9. MANAGERIAL SKILLS: • Able to make community diagnosis and take.	✓			

TOPICS FOR INTEGRATED TEACHING WITH DEPATMENT OF COMMUNITY MEDICINE AS PARTICIPANT:

1. Nutrition.
2. Iron deficiency anemia.
3. Communicable diseases with national Health Programme like.
    - ❖ HIV/AIDS.
    - ❖ Tuberculosis.
    - ❖ Malaria.
    - ❖ Polio.
    - ❖ Diarrhoeal diseases.
    - ❖ Leprosy.
    - ❖ Zoonotic diseases.
4. Lifestyle related diseases with preventive aspects lie.
    - ❖ Diabetes.
    - ❖ Hypertension.
    - ❖ Stroke.
    - ❖ Obesity.
    - ❖ Cancers.
5. Jaundice.
6. Alcoholism.
7. Death and dying.
8. Geriatric medicine.
9. Adolescent health.
10. Rational drug use.
11. Contraception.

12. Industrial health.
13. Ethical issues.

LEARNING RESOURCES MATERIALS:

Test books, reference books, practical note books, internet resources, video films etc.

RECOMMENDED BOOKS IN COMMUNITY MEDICINE:

1. Text book of preventive and social medicine by k park 19th edition.
2. Test book of preventive and social medicine by Gupta & Ghai.
3. Test book of preventive and social medicine by Gupta & Mahajan.
4. Essential of community medicine by Suresh Chandra.
5. Introduction to Biostatistics by Sathya Swaroop.
6. National Health Programme by Jugal Kishor.
7. National Health Programme by D K Taneja.

SUGESTED TOPICS FOR LEARNING THROUGH E – MODULES:

1. History of Medicine and public health.
2. Environmental health.
3. Nutrition (except public health nutritional program).
4. Epidemiological methods.
5. Screening.
6. Planning cycle.
7. Health management techniques.
8. Entomology.
9. Biostatistics.
10. Demography.
11. Disaster management.
12. Bio-medical waste management.
13. International health.
14. National health organizations.

FIELD VISITS FOR UNDERGRADUATE MEDICAL STUDENTS:

1. Sub center, primary health center and community health center/ district hospital.
2. Anganwadi centre.
3. Water and sewage treatment plant.
4. Industrial visit.
5. Family health advisor services*.
6. Clinic-social case review*.
7. Infectious diseases hospital.
8. DOTS center.
9. Malaria clinic.
10. School health.

* Family and hospital visits are for development of various skills in community and hospital setting.

METHOD OF ASSESSMENT:

Modified essay question, short answer questions, MCQs, problem solving exercises, OSCE, OSPE, Epidemiological Exercise, Record review, checklist. Research project reports and oral viva voce.

TEACHING LEARNING METHODS:

Structured interative sessions, small group discussion, focused group discussion (FGD), participatory learning appraisal (PLA), family and community visits, institutional visits, practical including demonstrations, problem based exercises, video clips, written case scenario, self learning tools, interactive learning and e- modules.

LEARNING RESOURSE MATERIALS:

Examination of community medicine should be at the end of 7th semester and formative and summative assessment during internship so that we have a basic doctor competent to provide primary care.

UNIVERSITY EXAMINATIONS

THEORY:

2 Papers of 3 hours duration and 100 marks each.

PATTERN OF QUESTION PAPER:

Marks: each paper – 100 marks

MCQs	=	20 X 1 = 20 Marks
Applied Questions	=	2 X 10 = 20 Marks
Short Answer Questions	=	12 X 5 = 60 Marks

Total: 100 Marks

Each paper will have 2 sections.

PRACTICAL MARK DISTRIBUTION

Practical mark: 80

Epidemiological exercise	}
Demographic exercise	} = 20
Basic statistics exercise	}
Spotters	= 20
Clinic – social case discussion	= 40

Total: 80

Viva = 20

INTERNAL ASSESSMENT – MARK DISTRIBUTION

I.A. MARK – 100

Theory	= 40
Practical	= 40
Record notebook	= 20

Total: 100

PASS CRITERIA:

	MAXIMUM	**MINIMUM**
Theory (Paper I & II)	200	100
Practical	80	40
Viva	20	-
Practical + Viva	100	50
Internal Assessment	100	40
GRAND TOTAL:	400	200

MEDICINE & ALLIED SUBJECTS

GENERAL MEDICINE

GOAL :

The broad goal of the teaching of undergraduate students in Medicine is to have the knowledge, skills and behavioral attributes to function effectively as the first contact physician.

OBJECTIVES

A. KNOWLEDGE

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

1. diagnose common clinical disorders with special reference to infectious diseases, nutritional disorders, tropical and environmental diseases.
2. outline various modes of management including drug therapeutics especially dosage, side effects, toxicity, interactions, indications and contra-indications.
3. propose diagnostic and investigative procedures and ability to interpret them.
4. provide first level management of acute emergencies promptly and efficiently and decide the timing and level of referral, if required.
5. recognize geriatric disorders and their management.

B. **SKILLS**;

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

1. develop clinical skills (history taking, clinical examination and other instruments of examination) to diagnose various common medical disorders and emergencies.
2. refer a patient to secondary and/or tertiary level of health care after having instituted primary care.
3. perform simple routine investigations like haemogram, stool, urine, sputum and biological fluid examinations.
4. assist the common bedside investigative procedures like pleural tap, lumbar puncture, bone marrow aspiration/biopsy and liver biopsy.

C. **INTEGRATION**;

1. with community medicine and physical medicine and rehabilitation to have the knowledge and be able to manage important current national health programs, also to be able to view the patient in his/her total physical, social and economic milieu.
2. with other relevant academic inputs which provide scientific basis of clinical medicine e.g. anatomy, physiology, biochemistry, microbiology, pathology and pharmacology.

GENERAL MEDICINE – SYLLABUS

A. CLINICAL METHODS IN THE PRACTICE OF MEDICINE

1. clinical approach to the patient: the art of medicine , doctor – patient relationship, commun ication skills and doctors responsibilities and medicolegal aspects and litigation.
2. Clinical approach to disease and care of patient; Diagnostic possibilities based on interpretation of history, physical findings and laboratory investigations and principles of rational management.

B. COMMON SYMPTOMS OF DISEASE

1. Pain ,Pathophysiology,clinical types,assessment and management
2. Fever: Pathophysiology of heat regulation,its disturbances, clinical types,clinical assessment and management
3. Cough, expectoration and haemoptysis
4. Dyspnoea,tachypnoea,and cyanosis
5. Common Urinary symptoms including dysuria, oliguria nocturia polyuria incontinence and enuresis
6. Oedema and anasarca
7. Shock and cardiovascular collapse
8. Palpitation and its causes
9. Anorexia,nausea and vomiting
10. Constipation and diarrhea
11. Haematemesis, malena and haematochezia

12. Jaundice and hepatomegaly splenomegaly
13. Abdominal distension and ascites
14. Weight loss and wight gain
15. Fainting,syncope and seizures; headache,dizziness and vertigo
16. Paralysis, movement disorders and disorders of gait and paraesthesia.
17. Coma and other disturbances of consciousness
18. Pallor and bleeding, various types of anaemia
19. Enlargement of lymp nodes and spleen
20. Joint pains and pain in the extremities and back
21. Importance of getting Rheumatic fever history

NUTRITION/EXPOSURE TO PHYSICAL AND CHEMICAL AGENTS

Nutriton in clinical medicine and dietary management

1. Nutritional requirements
2. Protein calorie malnutrition in adults
3. Obesity
4. Vitmain deficiency and excess
5. Acute and chronic effects of alcohol and their management
6. Venoms,stings,insect bites: poisonous snakes, and scorpions
7. Disturbances of temperature: heat stroke, exhaustion and cold exposure
8. Drowning,electrocution and radiation hazards

TOXICOLOGY

1. Introduction and general measures of management of poisoning
2. Barbiturate poisoning
3. Organophosphorous poisoning
4. Aluminium phosphide poisoning
5. Lead poisoning, Arsenic poisoning
6. Carbon monoixide poisoning, MIC poisoning
7. Copper sulphate and yellow oleader poisoning
8. Chelating agents

9. Drug over dosage

INFECTIONS

Approach to infectious diseases – diagnostic and therapeutic principles. General Principles of rational use of antibiotics and other chemotherapy against the following:

1. Common gram positive infections
2. Common gram negative infection
3. Enteric fever
4. Cholera, gastroenteritis. Food poisoning and dysentery
5. Influenza and other common viral respiratory infections
6. Rabies
7. Tetanus
8. Herpes simplex and herpes zoster
9. Amoebiasis and worm infestations
10. Malaria, filariasis, leishmaniasis, dengue, leptospirosis,and chickun gunya
11. Common exanthemata
12. HIV infection and infections in the immunocompromised conditions
13. Common sexually transmitted diseases
14. Common fungal infections
15. Viral encephalitis
16. Tuberculosis
17. Infectious mononucleosis
18. Brucellosis,plague, anthrax etc

HAEMATOLOGY

Definition, prevalence, aetilogical factors, Pathophysiology, pathology recognition, investigations and principles of treatmentof:

A. Anaemia: iron deficiency, megaloblastic and common haemolytic anaemias (thalassemia, sickle cell and acquired haemolytic)
B. Common bleeding disorders (thrombocytopenia haemophilia)

C. Agranulocytosis and aplastic anaemia

1. Leukaemias
2. Lymphomas
3. Blood group and tranfusion: Major blood group systems and histocompatibility complex, concepts of tranfusion and component therapy; indications of transfusion therapy, precautions to be taken during blood tranfusion, hazards of transfusion and safe handling of blood and blood products.

RESPIRATOPRY SYSTEM

1. Physiology and diagnostic methods: sputum examination, x-ray chest, pulmonary function tests and bronchoscopy
2. Upper respiratory infections
3. Pneumonias
4. Bronchiectasis and lung abscess
5. Bronchial asthma and tropical eosinophilia
6. Chronic obstructive airway disease and corpulmonale
7. Acute and chronic respiratory failure
8. Diseases of pleura: pleural effusion, empyema,pneumothorax
9. Pulmonary tuberculosis
10. Neoplasms of lung
11. Common occupational lung diseases
12. A.R.D.S

CARDIOVASCULAR SYSTEM

1. ECG, X ray chest with reference to common cardiovascular diseases.
2. Coronary artery disease
3. Rheumatic fever and rheumatic heart disease
4. Infective endocarditis
5. Hypertension and hypertensive heart disease
6. Acute and chronic heart failure

7. Common congenital heart disease in adolescents and adults: ASD,VSD,PDA,TOF and coarctation of aorta
8. Common cardiac arrhythmias
9. Acute and chronic pericarditis,pericardial effusion and cardiac tamponade
10. Common aortic diseases;peripheral vascular disease: arterial and venous

GASTROINTESTINAL TRACT

1. Stool examination,endoscopy and radiology in reference to common gastrointestinal diseases
2. Acid peptic disease
3. Malabsorption syndrome
4. Inflammatory bowel disease and irritable bowel syndrome
5. Acute and chronic hepatitis
6. Cirrhosis of liver
7. Abdominal tuberculosis
8. Liver function tests

EMERGENCY MEDICINE

1. Cardiopulmonary resuscitation
2. Acute pulmonary oedema
3. Hypertensive emergencies
4. Diabetic ketoacidosis and hypoglycaemia
5. Status epilepticus
6. Acute severe bronchial asthma
7. Shock and anaphylaxis
8. Acute myocardial infection
9. Upper GI bleed and hepatic coma
10. Diagnosis and management of comatose patient
11. Management of unknown poisoning
12. Fluid and electrolyte balance;acidosis and alkalosis in particular relevance to vomiting diarrhoea, uraemia and diabetic ketoacidosis

NERVOUS SYSTEM

1. Cerebrovascular diseases—Stroke.
2. Meningitis: Viral, bacterial and tuberculous
3. Peripheral neuropathy
4. Epilepsy
5. Extrapyramidal diseases,Parkinsons disease,chorea athetosis.
6. Common compressive and noncompressive spinal cord syndromes—Paraplegia.
7. Motor system disease
8. Myasthenia gravis
9. Common myopathies in India
10. Degenerative,nutritional,and metabolic disease of the nervous system
11. Migraine and cluster headache

RENAL DISEASES

1. Acute renal failure
2. Chronic renal failure
3. Glomerulonephritis and nephrotic syndrome
4. Urinary tract infections/pyelonephritis
5. Tubulointerstitial diseases and toxic nephropathies
6. Renal function tests(Microalbuminuria)

CONNECTIVE TISSUE DISORDERS

1. Rheumatoid arthritis
2. Gout
3. S.L.E
4. Osteomalacia and Osteoporosis
5. Ankylosing spondylitis/Reiter's arthritis
6. Osteo arthritis and cervical spondylosis

ENDOCRINE DISORDERS

1. Diabetes mellitus
2. Hypo and hyperthyroidism;iodine deficiency disorders

3. Cushing's syndrome and Addisons's disease; Hyperaldosteronism (Conn's syndrome)
4. Pituitary disorders;Gigantism,Acromegaly and Sheehan's syndrome
5. Calcium and phosporus metabolism: parathyroid and metabolic bone disease
6. Phaeochromocytoma

GERIATRICS

1. Biology of aging;factors accelerating senescence
2. Age related changes in various organ systems
3. Presentation of disease in the elderly; identification of common diseases
4. Diet for the aged; Management of Nutritional disorders
5. Acute medical problems – infection, dehydration,acute confusional states
6. Osteoporosis; Degenerative joint disease;effects of immobility prevention contracture and bed sores
7. Neurological disturbances – management & rehabilitation
8. Psychogeriatrics – sensory deprivation; personality charages,depressive illness
9. Social problems in the elderly – joint family system; day care center and day hospital; home for the aged.
10. Rehabilitation- Assessment of functional status – activities of daily living.Instrumental activities of daily living, role of physiotherapist and social worker.

SUGGESTED BOOKS:

1. Hutchinson's clinical methods
2. Macleod's clinical examination
3. Chamberlain – symptoms and signs of clinical medicine
4. Alagappan – clinical method – practice of medicine
5. Davidsons principle and practice of medicine
6. Golwalla – Text book of medicine for students
7. Kumar and clark's – clinical medicine
8. Text book of medicine – Dr. K.U. Krishnadas

PSYCHIATRY

GOAL:

Aim of teaching psychiatry to undergraduate medical student is to impart such knowledge and skills, so as to enable them to diagnose and treat common psychiatric disorders, handle emergencies, to refer complicated/unusual presentations.

A. OBJECTIVES:

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

1. Comprehend nature of different aspects of normal behaviour like learning, memory, personality, motivation, intelligence.
2. Recognize normal from abnormal behavior
3. Broadly classify psychiatry disorder
4. Recognize clinical manifestation of common disorders and plan their management
5. Describe rational use of different modes to therapy in these disorders

B. SKILLS:

1. Interview patient understand communication in doctor patient relationship Elicit detailed history
2. Conduct clinical examination for assessing mental status
3. Recognise psychopathological signs and symptoms
4. Diagnose common psychiatric disorders
5. Manage common psychiatric disorders
6. Identify and manage psychological reactions in special circumstances and in patients suffering from other medical and surgical disorders
7. Diagnose, manage in community settings

LECTURE SCHEDULE

BASIC BEHAVIOURAL SCIENCES

Introduction of psychiatry

Concept of mind	-	Normality Vs Abnormality
Definition of mental health	-	Qualities of mental health Basic Psychology
Learning	-	Types of learning, relevance in normal behaviour

Memory	-	Types of memory, mechanism, neuroanatomical/ Physiological/Biochemical correlates
Motivation	-	Theories, neurophysiology, correlates stress & theories
Emotion	-	Theories, neurophysiology, correlates stress & theories
Intelligence	-	Normal levels, assessment methods
Personality	-	Different types, causation. Theories, mental Mechanisms

NEUROBIOLOGY OF BEHAVIOURS

Functional Neuroanatomy

- Prefrontal cortex
- Basal Ganglia system
- Limbic system
- Reticular activating system

Neurotransmitters

- Dopamine system
- Serotonin system
- Norepinephrine system
- The cholinergic system
- Amino-acid – GABA, glutamate
- Genetics and Mental illness

PSYCHIATRIC CLASSIFICATION

Psychosis Vs Neurosis

- Severe mental illness Vs Common mental disorders

TYPES OF PSYCHIATRIC DISORDERS

- ❖ Cognitive disorders

Difference between organic and functional disorders

Delirium - Etiology, features, management

Dementia - Etiology, Treatable causes, clinical features, management

- Alcohol use disorders - Diagnosis,management, comorbid
- Other substance use disorder - Cannabis,opioid,solvents,nicotine,over counter drugs (OTC)
- Schizophrenia - Etiology,clinical features, management
- Mood disorders - Etiology, clinical features, management
- Neurotic and stress related disorder and somatoform disorders
  - Definition of neurosis
  - Anxiety (Neurotic) disorders - GAD, Panic, Phobia, OCD, PTSD
  - Etiology, clinical features, management
- Somatoform disorders - Somatization, Hypochondriasis, Somatoform Pain disorders, dissociative (Conversion) disorders
- Personality disorders - Definition, different types – cluster A,B,C Special empjasis on Schizoid,Histrionic, Antisocial personality disorders
- Eating disorders - Concept of eating disorders, clinical features of Anorexia nervosa (AN) Bulimia Nervosa (BN)
- Sleep Disorders - Stages of normal sleep, regulation,

Classification, Etiology of sleep disorders

- ❖ Sexual disorders - Various sexual dysfunction, special Reference to Erectile and ejaculating dysfunction, Paraphilia and gender identity disorders (GID)
- ❖ Psychiatric emergencies - Suicide,attempted suicide,violence
- ❖ Special population - Children (Mental retardation, learning disability, Autism,etc) Adolesccent Women Elderly.
- ❖ Psychiatry and physical illness - Psychiatric aspects of HIV, diabetes Mellitus, Cardio vascular disease Neurological disorders – Parkinson's stroke

TREATMENT METHODS:

1. Biological therapies
   a. Pharmacotherapy - Antipsychotics
      Antidepressants
      Mood stabilizers
      Antianxiety drugs
      Others
   b. Somatic therapies - ECT (Electro convulsive therapy)
      Bio feedback
      VNS (Vagus Nerve Stimulation)
      TMS
      Psychosurgery
   c. Psychological therapies - Basics of psychotherapy
      Types – Reconstructive – family therapy,
      Re educative – Behavioural therapy,
      Supportive Psycho therapy & counselling
      Other therapies

DEPARTMENT OF DERMATOLOGY, VENEREOLOGY & LEPROLOGY

GOAL:

The aim of teaching the undergraduate student in Dermatology, S.T.D. and Leprology is to impart such knowledge and skills that may enable him to diagnose and treat common ailments and to refer rare diseases or complications/unusual manifestations of common diseases, to the specialist.

OBJECTIVES:

1. **KNOWLEDGE:**

   At the end of the course of Dermato-S.T.D. and Leprology, the student Shall be able to:

   a. demonstrate sound knowledge of common diseases, their clinical manifestations, including emergent situations and of investigative procedures to confirm their diagnosis:
   b. demonstrate comprehensive knowledge of various modes of therapy used in treatment of respiratory diseases;
   c. describe the mode of action of commonly used drugs, their doses, side effects/toxicity, indications and contra-indications and interactions;
   d. describe commonly used modes of management including the medical and surgical procedures available for the treatment of various diseases and to offer a comprehensive plan of management for a given disorder;

2. **SKILLS:**

   The student should be able to:

   a. Interview the patient, elicit relevant and correct information and describe the history in a chronological order.
   b. Conduct clinical examination, elicit and interpret physical findings and diagnose common disorders and emergencies;
   c. Perform simple, routine investigative and office procedures required for making the bed-side diagnosis, especially the examination of scrapings for

fungus, preparation of slit smears and staining for AFB for leprosy patients and for STD cases;

d. Take a skin biopsy for diagnostic purposes;
e. Manage common diseases recognizing the need for referral for specialized care, in case of inappropriateness of therapeutic response;
f. Assist in the performance of common procedures, like laryngoscopic examination, pleural aspiration, respiratory physiotherapy, laryngeal intubation and pneumo-thoracic drainage/aspiration.

3. **INTEGRATION:**

The broad goal of effective teaching can be obtained through integration with departments of Medicine, Surgery, Microbiology, Pathology, Pharmacology and Preventive & Social Medicine.

TEACHING SCHEDULE FOR CLINICAL SUBJECTS:

THEORY CLASSES:

Skin and S.T.D. : 30 Hours.

CLINICAL POSTINGS:

Skin & STD

2 Weeks each in 4th 6th & 8th semester of MBBS. Totally 6 weeks.

a. Diseases caused by nutritional and environmental factors.
b. Infective disorders : Pyodermas, Common Viral and Fungal infections.
c. Infestations : Scabies, Pediculosis.
d. Allergic disorders: Urticaria, Atopic dermatitis, and contact dermatitis.
e. Common drug reactions and eruptions : Erythema multiforme, Toxic epidermal necrolysis and Exfoliative dermatitis.
f. Dermatitis and Eczema.
g. Alopecia and Hirsutism.
h. Sebaceous glands : Structure and Function; Acne, Seborrhoeic dermatitis, Other diseases; Pityriasis capitis.
i. Sweat glands : Structure, Function and Diseases; Miliaria, Hyperhidrosis.

j. Leprosy : Classification, Pathology, Clinical features, Diagnosis, Reactions, Management, Deformities and Control Programme.
k. Psoriasis.
l. Lichen Planus.
m. Sexually Transmitted Diseases : Genital ulcerative diseases, Genital discharge diseases.
n. Dermatological therapy.

PREFERABLE TO BE TAUGHT ON:

Vesiculobullous Diseases : Pemphigus, Pemphigiod and Dermatitis

Herpetiforms,. Melanocyte, Pigment metabolism and disorders of pigmentation; Icthyosis.

SKILLS:

a. Perform skin scrapings and do a KOH preparation for fungus infections.
b. Prepare slit skin and nasal smear for lepra bacilli.
c. Do staining for DTD cases.
d. More emphasis on HIV.

EXAMINATION:

THEORY: Paper II – General Medicine including Dermatology, Venerology & leprology.

INTERNSHIP:

Elective Postings (1 X 15 days): 15 days.

An intern must be able to:-

a. Conduct proper clinical examination, elicit and interpret physical findings and diagnose common disorders and emergencies.
b. Perform simple, routine investigative procedures for making bedside diagnosis, specially the examination of scrapings for fungus, preparation of slit smears and staining of AFB for leprosy patient and for STD cases.
c. Take a skin biopsy for diagnostic purpose.
d. Manage common disease recognizing the need for referral for specialized care in case of inappropriateness of therapeutic response.

UNIVERSITY EXAMINATION

THEORY:

Two papers carrying 100marks each of 3 hours duration

Paper - I:

General medicine including therapeutics.

Paper – II:

1. General medicine including tropical diseases, Dermatology, Venerology, Leprology, Psychiatry.

PATTERN OF QUESTION PAPER:

Each paper – 100 marks

MCQ'S	=	20x1	= 20marks
Applied Questions	=	2X10	= 20marks
Short Answer Questions	=	12x5	= 60marks

Each paper will have 2 sections.

PAPER - II

SECTION: A (General Medicine including tropical medicine)

SECTION : B (General Medicine including tropical diseases, Dermatology and Psychiatry)

				MARK
Tropical Medicine – applied Question			:	10
Psychiatry	2 short notes	(3X5)	:	15
Dermatology	2 short notes	(3X5)	:	15
General Medicine	2 short notes	(2X5)	:	15
				40

PRACTICAL MARK DISTRIBUTION

Practical Mark: 80marks

1. Long case	-	40marks
2. Short case	-	20marks
3. Spotters	-	20marks

	Total:	80marks

Viva 20Marks

25% of total theory marks in medicine will be allotted for the Discipline of Psychiatry & Dermatology.

INTERNAL ASSESSMENT – MARK DISTRIBUTION

I.A. MARK – 100

Theory	=	40
Practical	=	40
Record notebook / Assignment	=	20

Total:		100

PASS CRITERIA:

	MAXIMUM	MINIMUM
Theory (paper I &II)	200	100
Practical	80	40
Viva	20	-
Practical +Viva	100	50
Internal Assessment	100	40
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Grand Total	400	200
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PAEDIATRICS

PEDIATRICS

Pediatrics including Neonatology

The course includes systematic instructions in growth and development, nutritional needs of a child, immunization schedules and management of common diseases of infancy and childhood, scope of Social Pediatrics and counselling.

GOAL

The broad goal of the teaching of undergraduate students in Pediatrics is to acquire adequate knowledge and appropriate skills for optimally dealing with major health problems of children to ensure their optimal growth and development.

OBJECTIVES

A. KNOWLEDGE

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

a. Describe the normal growth and development during foetal life, neonatal period, childhood and adolescence and outline deviations thereof.
b. Describe the common paediatric disorders and emergencies in terms of epidemiology, etiopathogenesis, clinical manifestations, diagnosis, rational therapy and rehabilitation.
c. State age related requirements of calories, nutrients, fluids, drugs etc. in health and disease.
d. Describe preventive strategies for common infectious disorders, malnutrition, genetic and metabolic disorders, poisonings, accidents and child abuse.
e. Outline national programmes relating to child health including immunization programmes.

B. SKILLS

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

a. Take a detailed pediatric history, conduct an appropriate physical examination of children including neonates, make clinical diagnosis, conduct common bedside investigative procedures, interpret common laboratory investigation results and plan and institute therapy.

b. Take anthropometric measurements, resuscitate newborn infants at birth, prepare oral rehydration solution, perform tuberculin test, administer vaccines available under current national programs, perform venesection, start an intravenous saline and provide nasogastric feeding.
c. Conduct diagnostic procedures such as lumbar puncture, liver and kidney biopsy, bone marrow aspiration, pleural tap and ascitic tap.
d. Distinguish between normal newborn babies and those requiring special care and institute early care to all new born babies including care of preterm and low birth weight babies, provide correct guidance and counselling in breast feeding.
e. Provide ambulatory care to all sick children, identify indications for specialized/inpatient care and ensure timely referral of those who require hospitalization.

C. INTEGRATION

The training in pediatrics should prepare the student to deliver preventive, promotive, curative and rehabilitative services for care of children both in the community and at hospital as part of a team in an integrated form with other disciplines, e.g. Anatomy, Physiology, Biochemistry, Microbiology, Pathology, Pharmacology, Forensic Medicine, Community Medicine and Physical Medicine and Rehabilitation.

SYLLABUS FOR MBBS COURSE

1. **INTRODUCTION TO PAEDIATRICS:**
2. **GROWTH AND DEVELOPMENT:**
    a. Assessment of growth and development.
    b. Growth curves and road to health chart.
    c. Short stature.
    d. Failure to thrive.
3. BEHAVIOURAL DISORDERS:
    a. Pica.
    b. Temper tantrums.

c. Thumb sucking.
d. Breath holding spells.
e. Enuresis.
f. Autism.
g. Phobia.
h. Eating disorders.

4. LEARNING DISORDERS:
5. CHILDREN WITH SPECIAL NEEDS:
    a. Child adoption.
    b. Child abuse.
6. NUTRITION:
    a. Brest feeding, BFHI.
    b. Normal requirements of nutrients.
    c. Complementary feeding.
    d. Nutritional deficiency disorders (protein energy malnutrition, vitamin deficiencies, trace element deficiency).
    e. Obesity.
7. COMMUNITY PAEDIATRICS:
    a. Definition of mortality rates, causes of IMR and prevention.
    b. IMNCI.
    c. National programs.
    (National anemia control program, RCH, ICDS, CEMONC, national nutrition program).
8. IMMUNIZATION:
    a. National immunization schedule.
    b. Vaccine preservation and cold chain.
    c. Individual vaccines.
9. NEONATOLOGY:
    a. Resuscitation of newborn.
    b. Examination of newborn.

c. Assessment of gestational age.
d. Thermoregulation and hypothermia.
e. Birth injury.
f. Common neonatal problems.
g. Low birth weight.
h. Preterm.
i. Congenital anomalies in newborn.
j. Birth asphyxia.
k. Neonatal jaundice.
l. Neonatal convulsion.
m. Neonatal sepsis.
n. Respiratory distress in newborn.
o. Haemorrhagic disease of newborn.

10. IMMUNOLOGY:
    a. Immune system.
    b. Allergic disorders.
    c. Urticaria.
    d. Allergic rhinitis.
    e. Atopic eczema.

11. RHEUMATIC DISEASES OF CHILDHOOD:
    a. Juvenile idiopathic arthritis.
    b. Systemic lupus erythematosis.
    c. Kawasaki disease.
    d. Henoch schonlein purpura.

12. INFECTIOUS DISEASES:
    a. Enteric fever.
    b. Tuberculosis.
    c. Leptospirosis.
    d. Dengue fever.
    e. Diphtheria, pertussis, tetanus, mumps.

f. Fever with rash (measles, rubella, varicella zoter).
g. Malaria.
h. HIV infection.
i. Poliomyelitis.
j. Helminthiasis.
k. Scrub typhus.
l. HINI virus.
m. Fungal infection.
n. Herpes simplex infection.
o. TORCH infection.
p. Rabies.

13. DIGESTIVE SYSTEM:

a. Diahorrea.
b. Dysentery.
c. Abdominal pain.
d. Hepatitis.
e. Hepatic failure.
f. Ascites.
g. Portal hypertension.
h. Liver transplantation.

14. RESPIRATORY SYSTEM:

a. Common cold.
b. Pharyngitis.
c. Laryngotracheobronchitis.
d. Laryngomalacia.
e. Stridor in children.
f. Bronchiolitis.
g. Pneumonia.
h. Bronchiectasis.
i. Pleural effusion.

j. Pneumothorax.
k. Pneumo mediastinum.
l. Asthma.

15. CARDIOVASULAR SYSTEM:
    a. Congenital heart disease.
    b. Rheumatic fever and rheumatic heart disease.
    c. Infective endocarditis.
    d. Congestive cardiac failure.
    e. Hypertension.

16. CENTRAL NERVOUS SYSTEM:
    a. Meningitis.
    b. Encephalitis.
    c. Convulsions.
    d. Cerebral palsy.
    e. Mental retardation.
    f. Microcephaly.
    g. Macrocephaly.
    h. Hydrocephalous.
    i. Movement disorders.
    j. Neurocutaneous markers.
    k. Pseudo tumor cerebri.
    l. Facial nerve palsy.

17. HAEMATOLOGY:
    a. Pancytopenias.
    b. Anemias.
    c. Bleeding disorders.
    d. ITP.
    e. Hemophilia.
    f. DIC.
    g. Blood components.

h. Hypersplenism.

18. ONCOLOGY:
    a. Leukemia.
    b. Lymphomas.
    c. Brain tumor in children.
    d. Wilm's tumor.
19. NEPHROLOGY:
    a. Haematuria.
    b. Acute glomerulo nephritis.
    c. Nephritic syndrome.
    d. Urinary tract infection.
    e. Renal failure (acute renal failure, chronic kidney disease, end stage renal disease).
20. ENDOCRINOLOGY:
    a. Hypothyroidism.
    b. Type 1 diabetes mellitus.
21. GENETIC DISORDERS AND COUNSELING:
    a. Down's syndromes.
    b. Genetic counseling.
22. EMERGENCY MEDICINE:
    a. Fluid and electrolyte imbalance.
    b. Shock.
    c. Poisoning.
    d. Snake bite.
    e. Scorpion sting.
    f. Submersion injury.
23. MICELLANEOUS:
    a. Pyrexia of unknown origin.
    b. Approach to jaundice.
    c. Approach to hepatosplenomegaly.

d. Approach to lymphadenopathy.
e. Headache.

24. ADOLESCENT HEALTH:

a. General problems in adolescents.

25. PAEDIATRIC SURGERY:

a. Volvulus.
b. Malrotation of gut.
c. Appendicitis.
d. Intususception.
e. Undescended testis.
f. Hernia.
g. Bleeding per rectum.
h. Infantile hypertrophic pyloric stenosis.
i. Anorectal malformations.
j. Hirchprung's disease.
k. Burns.
l. Accidents.

UNIVERSITY EXAMINATIONS

THEORY:

2 Papers of 100 marks each and 3 Hours Duration.

PATTERN OF QUESTION PAPER:

Marks: each paper – 100 marks

MCQs	=	20 X 1 = 20 Marks
Applied Questions	=	2 X 10 = 20 Marks
Short Answer Questions	=	12 X 5 = 60 Marks

Total: 100 Marks

Each paper will have 2 sections.

PRACTICAL MARK DISTRIBUTION

Practical mark: 80

Long Case	= 40
Short Case(2 x 20)	= 40

Total: 80

Viva	**20**
X – Ray	= 5
Vaccine & drug	= 5
Nutrition	= 5
Instruments	= 5

Viva Total:	20

INTERNAL ASSESSMENT – MARK DISTRIBUTION

I.A. MARK – 100

Theory	= 40
Practical	= 40
Record notebook/Log Book	= 20
Assignments	

Total: 100

Pass criteria:

THEORY	MAXIMUM	MINIMUM
1 Paper	100	50
Practical	80	40
Viva	20	-
Practical + Viva	100	50
Internal Assessment	100	40
GRAND TOTAL:	300	150

SURGERY & ALLIED SUBJECTS

GENERAL SURGERY

GOAL:

The broad goal of the teaching of undergraduate students in surgery is to produce graduates capable of delivering efficient first contact surgical care

OBJECTIVES:

A. KNOWLEDGE:

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

1. Describe aetiology, pathophysiology, principles of diagnosis and management of common surgical problems including emergencies, in adults and children
2. Define indications and methods for fluid and electrolyte replacement therapy including blood transfusion
3. Define asepsis, disinfection and sterilization and recommended judicious use of antibiotics
4. Describe common malignancies in the country and their management including prevention
5. Enumerate different types of anaesthetic agents, their indications, mode of administration, contraindications and side effects

B. SKILLS:

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

1. Diagnose common surgical conditions both acute and chronic, in adult and children
2. Plan various laboratory tests for surgical conditions and interpret the results
3. Identify and manage patients of hemorrhagic,septicaemic and other types of shock
4. Be able to maintain patent air-way resusciatate

a) A critically injured patient

b) Patient with cardio-respiratory failure

c) A drowning case

5. Monitor patients of head, chest, spinal and abdominal injuries, both in adults and children
6. Provide primary care for a patient of burns
7. Acquire principle of operative surgery, including pre-operative, operative and post operative care and monitoring
8. Treat open wounds including preventive measures against tetanus and gas gangrene
9. Diagnose neonatal and pediatric surgical emergencies and provide sound primary care before referring the patient to secondary/tertiary centers
10. Identify congenital anomalies and refer them for appropriate management In addition to these he should have observe/assisted/performed the following:

a) Incision and drainage of abscess
b) Debridement and suturing open wound
c) Venesection
d) Excision of simple cyst and tumours
e) Biopsy of surface malignancy
f) Catheterisation and nasogastric intubation
g) Circumcision
h) Meatotomy
i) Vasectomy
j) Peritoneal and pleural aspirations
k) Diagnostics proctoscopy
l) Hydrocele operation
m) Endotracheal intubation
n) Tracheostomy and cricothyreidotomy
o) Chest tube insertion

C. **INTEGRATION:**

The undergraduate teaching in surgery should be integrated at various stages with different pre and para and other clinical departments

GENERAL SURGERY – SYLLABUS

I. GENERAL PRINCIPLES:

1. Introduction to principles and practice of surgery
2. History of surgery
3. Fluid,electrolyte and acid-base balance
4. Shock
5. Haemorrhage and blood transfusion
6. Surgical nutrition
7. Wounds, tissue repair and scars
8. Wound infection – classification and management
9. Tumours, ulcers, cyst, sinuses & fistulae
10. Specific infections
    - Tetanus
    - Gas-gangrene
    - Koch-s
    - Leprosy
    - Syphilis
11. Parasitic infections:
    - Protozoa – (eg.Amoebiasis)
    - Helminth –(eg;SH)
    - Nematodes – (eg: Ascariasis,Filariasis)
    - Cestodes – (eg:Hydatid)
12. HIV & AIDS
13. Asepsis, Antisepsis, Sterilization
14. Diabetes mellitus – Surgical manifestations
15. Burns
16. Principles of plastic & reconstructive surgery
17. Principles of Oncology
18. Palliative care

19. Accident & Emergency surgery
20. Warfare injuries
21. Scalp, skull, brain, maxillo-facial and nerve injuries
22. Principles of Neuro-surgery
23. Organ Transplantation
24. Surgical audit and research
25. Ethics
26. Communication skills

II. SYSTEMIC SURGERY

1. **Common skin & soft tissue conditions**
    a) Cyst, Benign,premalignant and malignant conditions of skin and soft tissues
    b) Pressure sores – prevention and management
2. **Arterial Disorders**
    a) Acute arterial obstruction: diagnosis and initial management, types of gangrene; diagnosis of chronic arterial insufficiency with emphasis on Buerger's disease, atherosclerosis; investigation in case of arterial obstruction, amputations, vascular injuries; basic principles of management.
3. Venous Disorders
    a) Varicose vein; diagnosis and management; deep vein thrombosis – diagnosis, prevention, principles of therapy, thrombophlebitis
4. Lymphatics and Lymph nodes
    a) Diagnosis and principles of management of lymphangitis, lymphedema, acute and chronic lymphadenitis; cold abscess, lymphomas; surgical manifestations of filariasis.
5. Oral cavity, jaw, salivary glands
    a) Cleft lip and palate; Leukoplakia, retension cysts; ulcers of the tongue
    b) Features, diagnosis and basic principles of management of carcinoma lip,buccal mucosa and tongue,prevention and staging of oral carcinomas
    c) Salivary glands: Acute sialadenitis,neoplasms,diagnosis and principles of management

d) Epulis,cysts and tumors of jaw, salaivary fistulae

6. Neck
    a) Branchial cyst, Cystic hygroma
    b) Cervical lymphadenitis, non specific and specific tuberculosis of lymphnodes, secondaries in neck
    c) Thoracic outlet syndrome;diagnosis and management
7. Thyroid Gland
    a) Throid : Surgical anatomy, Physiology investigations of thyroid disorders; types, clinical features, diagnosis and principles of management of goiter, thyrotoxicosis and malignancies, thyroglossal cyst and fistula.
    b) Thyroiditis, Hypothyroidism
8. Parathyroid and Adrenal glands
    a) Clinical features and diagnosis of hyperparathyroidism, adrenal hyperfunction/hypofunction
9. Breast
    a) Surgical anatomy, nipple discharge,acute mastitis,breast abscess, mammary dysplasia,gynaecomastia,fibroadenoma(Benign breast disease)
    b) Assessment and investigation of a breast lump
    c) Cancer breast; Diagnosis, staging, principles of management
10. Throax
    a) Recognition and treatment of pneumothorax,haemothorax, pulmonary embolism, prevention/recognition and treatment, flail chest, stove in chest. postoperative pulmonary complications
    b) Principles of management of pyothorax, cancer lung
11. Heart and Pericardium
    a) scope of cardiac surgery
12. Oesophagus
    a) Benign conditions of oesophagus and GERD
    b) Dysphagia, causes, investigation and principles of management

c) Cancer oesophagus, principles of management

13. Stomach and Duodenum
    a) Anatomy, physiology, congenital hypertrophic pyloricstenosisl; aetiopathogenesis, diagnosis and management of peptic ulcer, cancer stomach, upper gastointestinal haemorrhage with special reference to bleeding varices and duodenal ulcer
14. Liver
    a) Clinical features, diagnosis and principles of management of amoebic liver abscess,hydatid cyst and portal hypertension
    b) Surgical anatomy,primary and secondary neoplasms of liver
    c) Liver trauma
15. Spleen
    a) Splenomegaly,causes,investigations and indications of splenectomy;splenic injury
16. Gall Bladder and Bile Ducts
    a) Anatomy,physiology and investigations of biliary tree,clinical features, diagnosis, complications and principles of management of cholelithiasis and cholecystitis;obstructive jaundice
    b) Carcinoma gall bladder, choledochal cyst
17. Pancreas
    a) Acute pancreatitis,clinical features, diagnosis, complications and management
    b) Chronic pancreatitis, cancer pancreas
18. Peritoneum, Omentum, Mesentery and Retroperitoneal space
    a) Peritonitis,causes recognition and principles of management,inta-peritoneal abscesses, mesentric cysts,retriperitonial cysts and neoplasm
    b) Laparaoscopy
19. Small and Large intestine
    a) Diagnosis and principles of treatment of intestinal amoebiasis,tuberculosis of intestine,carcinoma colon,lower gastrointestinal haemorrhage

b) Ulcerative colitis,Crohns disease,premalignant conditions of large bowel
c) Intestinal obstruction, types aeitiology, diagnosis and principles of management, paralytic ileus
d) Acute abdomen, causes, approach, diagnosis and principles of management
e) Appendix, diagnosis and management of acute appendicitis, appendicular lump and abscess

20. Rectum
a) Surgical anatomy, clinical features of rectal disease and investigations
b) Carcinoma of rectum, diagnosis, clinical features and principles of management. Indications and management of colostomy
c) Prolapse of rectum

21. Anal Canal
a) Surgical anatomy, clinical features and management of fissure,fistula in ano,perianal and ischiorectal abscess and haemorrhoids,Diagnosis and referral of anorectal anomalies
b) Anal carcinoma

22. Hernias
a) Clinical features, diagnosis, complications and principles of management of, umbilical, inguinal and femoral hernia
b) Epigastic hernia,omphalitis,umbilical fistulae,burst abdomen and ventral hernia

23. Genito – Urinary system
a) Symptoms and investigations of the urinary tract
b) Investigations of renal mass, diagnosis and principles of management of urolithiasis, hydronephrosis, pyonephrosis, perinephric abscess and renal tumours, cyst.
c) Renal tuberculosis
d) Causes, diagnosis and principles of management of haematuria, anuria and acute retention of urine & incontineuence of urine
e) Benign prostatic hyperplasia, diagnosis and management carcinoma prostate

f) Diagnosis and principles of management of phimosis, paraphimosis and carcinoma penis
g) Principles of management of urethral injuries, strictures.
h) Diagnosis and principles of treatment of undescended testis, torsion testis, hydrocele, haematocele, pyocoele, Fourmiers gangrene, epididymoorchitis and testicular tumours
i) Varicocele.

III. FUNDAMENTAL OF PAEDIATRIC SURGERY

1. Anatomy,physiology (difference between child and adult)
2. Principles of management of trauma in a child
3. Common paediatric surgical conditions
   a) Congenital hernia (inguinal, umbulica)
   b) Undescended testis
   c) Hypospadias
   d) Hypertrophic pyloric stenosis
   e) Interssusception
   f) Acute (abdominal pain-diagnosis & management)
   g) Rectal prolapse
   h) Congenital malformations of GI tract : Atresia, Hirschsprings disease, anorectal malformation,urinary tract malformation – polycystic kidney
   i) Paediatric surgical oncology(Neuroblastoma, Wilms, Rhabdomyosarcoma)

IV. SURGICAL ANATOMY AND PRINCIPLE OF OPERATIVE SURGERY

1. The OR (Operating room) – Layout, Asepsis, Sterilisation etc
2. Investigations and Assessment of the patient for surgery
3. Preparing the patient for surgery (including pre-operative counseling, informed consent etc)
4. Principles of anaesthesia and pain management

5. Basic surgical skills and techniques (instruments, suture materials, IV line, CVP line, venous cut down, Catheterisation, Enema, lumbar puncture, Ascitic and pleural tap, emergency intubation, ICD)
6. Post-operative management and rehabilitation
7. Specific surgeries
    a) Minor procedures – incision and drainage, sebaceous cyst excision, ear lobe repair, wound dressing,circumcision (day care surgery)Vasectomy
    b) Hydrocele
    c) Hernia
    d) Tracheostomy
    e) Appendix
    f) Thyroid
    g) Breast
    h) Varicose Veins
    i) Laparotomy- surface markings, incisions and drains
    j) Stomach – T.Vagotomy and GJ, Perforation closure
    k) Bowel Anastomosis
    l) Universl precautions
    m) Principles of laparoscopic surgery/endosurgery

ORTHOPAEDICS

1. **KNOWLEDGE:**

   The student should be able to:

   a. Explain the principles of recognition of bone injuries and dislocation.
   b. Apply suitable methods to detect and manage common infections of bones and joints.
   c. Identify congenital, skeletal anomalies and their referral for appropriate correction or rehabilitation.
   d. recognize metabolic bone diseases as seen in this country.
   e. explain etiogenesis, manifestations, diagnosis of neoplasm affecting bones.

2. **SKILLS**

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

   a. Detect sprains and deliver first aid measures for common fractures and sprains and manage uncomplicated fractures of clavicle, Colles's, forearm, phallanges etc.
   b. Techniques of splinting, plaster, immobilization etc.
   c. Management of common bone infections, learn indications for sequestration, amputations and corrective measures for bone deformities.
   d. Aspects of rehabilitation for Polio, Cerebral Palsy and Amputation.

3. **APPLICATION:**

   a. Be able to perform certain orthopedic skills, provide sound advise of skeletal and related conditions at primary or secondary health care level.

4. **INTEGRATION:**

   a. Integration with anatomy, surgery, pathology, rediology and Forensic Medicine be done.

5. **OBJECTIVES:**

   1. Embryoloy, applied anatomy, physiology, pathology, clinical features, diagnostic procedures and the principles of therapeutics including

preventive methods, (medical/surgical) pertaining to musculoskeletal system.

2. Clinical decision making ability & management expertise: Diagnose conditions from history taking, clinical evaluation and investigation and should be able to distinguish the traumatic from infective and neoplastic disorders.
3. Thrust areas.
    a. Pediatric orthopaedics – the student should be exposed to common congenital and developmental disorders such as CTEV (Club – Foot), development dysplasia of hip, perthe's disease and infection, and also should acquire adequate knowledge about the principles of management of these disorders.
    b. Orthopaedic oncology – the undergraduate is expected to be familiar with the common tumours encountered in orthopaedic practice. The student should be able to diagnose common bone.
    c. Management of Trauma – Trauma in this country is one of the main causes of morbidity and mortality in our demographic statics. The student is expected to be fully conversant with trauma in its entirety including basic life saving skills, control of hemorrhage, splintage of musculoskeletal injuries and care of the injured spine.
    d. Sports Medicine - The student should know about common orthopaedic pathologies encountered in sportspersons and their diagnostic and preventive aspects. 120 sy.
    e. Physical medicine and rehabilitation – The student is expected to be familiar with common orthotic and prosthetic devices and their applications.
    f. Orthopedic neurology – The student should be exposed to all kinds of nerve injuries as regards their recognition & principles of management, cerebral palsy and acquired neurologic conditions such as post polio residual paralysis.

g. Disorders of spine – The student is expected to be familiar with various kinds of spinal disorders such as scoliosis, kypho – scoliosis, spinal trauma, prolapsed intervertebral disc and infections (tuberculosis and pyogenic) as regards their clinical presentations and principles of management.

h. Radiology – acquire knowledge about radiology/imaging and should be able to interpret radiographs typical of common orthopaedic radiographs typical of common orthopaedic pathologies.

I. **TEACHING LEARNING ACTIVITIES:**

Didactic lectures.

Under Graduate will attend didactic lectures on the following topics.

- Fracture: Definition, classification, principles of management.
- Fracture healing, delayed union.
- Classification & management of open fractures.
- Management of fracture calvicle, dislocation shoulder & fracture shaft humerus.
- Classification of injuries around elbow & management of supracondylar fracture & dislocation of elbow.
- Monteggia fracture dislocation & fracture both bones of forearm.
- Volkamann's ischaemic contracture.
- Fracture of lower end of radius fracture scaphoild and metacarpals.
- Fracture pelvis & dislocation of hip.
- Fracture neck of femur.
- Fracture shaft of femur & tibia.
- Internal Derangements of knee, injuries of ankle & foot amputations.
- Congenital Malformations: CTEN Torticollis.
- Congenital Malformation: CDH, Pseuodoarthrosis tibia etc.
- Disorders of the hip: coax vary, Perthes diseases.
- Deformities of the spine.
- Acute Pylogenic ostyemyelitis.

- Chronic pyogenic ostyemyelitis.
- Septic Arthritis.
- Other Arthritides (Rheumatoid/Ank. Spond).
- Osteo – articular tuberculosis:
- General consideration & Principles of management.
- Tuberculosis: Spine.
- Poliomyelitis.
- Bone Tumours: Benign tumors.
- Bone Tumours: malignant tumors.
- Integrated seminars – combined interdisciplinary seminars on subjects like.
- Arthritis, tuberculosis, osteoporosis etc.

II. **SPECIFIC ACTIVITIES IN DETAIL:**

a. Case presentation in the ward and the afternoon special clinics (such as scoliosis/Hand clinics). UG will present a clinical case for discussion before a faculty in the ward every morning.

b. Case conference undergraduate will attend case conference on every Monday afternoon where the residents are expected to work – up one long case and three short cases and present the same to a faculty member and discuss the management in its entirety.

c. X- Ray Classes – UG should attend x-ray classes held twice weekly in morning in which the radiologic features of various problems are discussed.

d. Surgicopathological conference: UG should attend period surgicopathology conferences in which special emphasis is made on the surgical pathology and the radiological aspect of the case in the pathology department.

III. **TEST BOOKS RECOMMENDED:**

Title of the book Author Publisher

Outlines of Fractures Crawford Churchill Livingstone Adams.

Closed Treatment of Fracutes H.John Churchill Livingstone Charnley.

Outlines of Orthopaedics Crawford Churchill Livingstone Adams.

Natrajan's textbook of Orthopaedics and Traumatology, 7/ed.

Under Graduates fractures and orthopaedics : S. DAS

Essential Orthopaedics Maheshwari.

COURSE CONTENTS

I. **TRAUMA:**

1. General principles in diagnosis, first aid and treatment methods of closed fractures and open fractures, open reduction including principles of internal fixation and external fixation, their complications. Preservation of amputated parts before transfer.
2. General principles of diagnosis and management of non – unions and delayed unions.

II. **DIAGNOSIS, FIRST - AID AND REFERRAL OF:**

1. Fracture clavicle.
2. Anterior dislocation of shoulder.
3. Fracture femur neck, trochanter and shaft.
4. Haemarthrosis, traumatic synovitis.
5. General principles of management of hand injuries.
6. Polytrauma.
7. Complications of fracture: fat embolism, ischaemic contracture, myositis ossificans, osteodystrophy.
8. Fracture proximal end, shaft, supracondylar, and internal condylar humerus.
9. Posterior dislocation of elbow.
10. Fracture shaft of radius and ulna.
11. Traumatic dislocation of hip.
12. Fracture patella.
13. Fracture shaft tibia and fibula.
14. Injury to muscles and ligaments (shoulder arc syndrome, tennis elbow, ankle sprain).
15. Peripheral nerve injuries.

16. Spinal injuries.
17. Fracture of olecranon.
18. Monteggia fracture dislocation.

III. **INFECTIONS OF BONES AND JOINTS:**

Diagnosis and principles of management:-

1. Osteomyelitis: pyogenic, tubercular, fungal (mudurafoot), syphilitic and parasitic infection of bone.
2. Arthritis: Septic and tubercular.
3. Tuberculosis of the spine.
4. Leprosy – Principles of corrective surgery.

IV. **TUMOURS:**

Diagnosis and principles of management:-

1. Benign lesions: multiple exostosis, enchondroma, osteoid osteoma, simple bone cyst, osteochondroma.
2. Malignanat lesions: Osteochondroma, Ewing's sarcoma, giant cell tumour, chondrosarcoma and secondary deposits.

V. **DEGENERATIVE DISEASES:**

Diagnosis and principles of management:-

1. Osteoarthritis.
2. Spondylosis.
3. Degenerative disc diseases.

VI. **CONGENITAL ANOMALIES:**

Diagnosis and principles of management:-

1. Congenital dislocation hip.
2. Congenital talipes equinovarus.
3. Pes planus.

VII. **BONE DYSPLASIA:**

Diagnosis and principles of management:-

1. Osteogenesis imperfect.
2. Achondroplasia.

VIII. **NEURO – MUSCULAR DISORDERS:**

Diagnosis and principles of management:-

1. Post – polio residual paralysis.
2. Cerebral palsy.

IX. **OSTEOCHONDROSES:**

Diagnosis and principles of management:-

1. Perthe's disease.

X. **DEFORMITIES:**

1. Scoliosis – diagnosis and referral.
2. Genu Varum and Valgum – diagnosis.

XI. **PREVENTIVE ORTHOPAEDICS:**

1. Osteoporosis.
2. Osteopenia.
3. Osteomalacia.
4. Scurvy.
5. Rickets.

XII. **BASIC PRINCIPLES OF PHYSIOTHERAPY, OCCUPATIONAL THERAPY AND ORTHOTICS/PROSTHETICS TO KNOW:**

1. Physiatric evaluation of common neurological diseases.
2. Physiatric evaluation of common orthopaedic conditions.
3. Principles of cardiopulmonary rehabilitation.
4. Principles of exercise therapy, electrotherapy and occupational therapy.
5. Principles of orthotics and prosthetics.

XIII. **SKILLS:**

1. Obtain a proper relevant history, and perform a humane and thorough clinical examination in adults and children including neonates.
2. Arrive at a logical working diagnosis after examination.
3. Plan and institute a line of treatment which is need based, cost effective and appropriate for common ailments.

4. Recognize situations which call for urgent or early treatment at secondary and tertiary centres and make a prompt referral of such patients after giving first aid or emergency treatment.
5. Be able to do surface marking of common superficial arteries, veins, nerves and viscera.
6. Interpret skiagrams of common fractures and dislocations.
7. Apply skin traction.
8. Apply figure of 8 bandage for fracture clavicle.
9. Apply POP slabs/casts and splints.
10. Transport safely victims of accidents including those with spinal injury.
11. Reduce colle's fracture.
12. Reduce shoulder dislocation.
13. Reduce tempero – mandibular joint dislocation.
14. Perform nerve blocks like infiltration, digital, pudendal, paracervical and field block.

UNIVERSITY EXAMINATION

GENERAL SURGERY

THEORY:

Two papers carrying 100marks each of 3 hours duration

Paper - I:

General Surgery including anaesthesia, radiology.

Paper – II:

General Surgery including orthopaedics

Section A: General Surgery

Section B: Orthopaedics

Section A:

Mcq's	= 20x 1 =	20marks
Applied Questions	= 1x10 =	10marks
Short answer questions	= 6x5 =	30marks
	Total =	40marks (Surgery)

Section B:

Applied questions	= 1x10 =	10 marks
Short Answer questions	= 6x5 =	30marks
	Total =	40marks (Ortho)

Orthopeadics will constitute 25% of the total theory marks in surgery. The questions will form a separate section in Part.II (Section.B) .The student must secure atleast 40% of marks in Orthopeadics section and 50% marks in total as pass percentage.

PATTERN OF QUESTION PAPER:

Marks: each paper – 100 marks –3 HOURS DURATION.

MCQ'S	=	20x1	= 20marks
Applied Questions	=	2X10	= 20marks
Short Answer Questions	=	12x5	= 60marks

Each paper will have 2 sections.

PRACTICAL MARK DISTRIBUTION

Practical Mark: 80 Marks

Clinical – I (General Surgery)

One Long case	1 hour	40marks
Clinical – II Two short cases	30mts	40marks (20 for ortho + 20 for surgery)

Viva **20Marks**

a. Ortho : 5marks
b. X ray : 5marks
c. Instrument : 5marks
d. Operative surgery: 5marks

INTERNAL ASSESSMENT – MARK DISTRIBUTION

I.A. MARK – 100

Theory	=	40
Practical	=	40
Record notebook	=	20
Total:		100

PASS CRITERIA:

	MAXIMUM	**MINIMUM**
Theory (paper I &II)	200	100
Practical	80	40
Viva	20	-
Practical +Viva	100	50
Internal Assessment	100	40
Grand Total	400	200

OBSTETRICS AND GYNAECOLOGY

OBSTETRICS AND GYNAECOLOGY

Obstetrics and Gynaecology to include family welfare and family planning.

GOAL:

The broad goal of the teaching of undergraduate students in Obstetrics and Gynaecology is that he/she should acquire understanding of anatomy, physiology and pathophysiology of the reproductive system and gain the ability to optimally manage common conditions affecting it & also about pregnancy & delivery & associated complications & to acquire knowledge about new born investigations and common problems in early neonatal period.

OBJECTIVES

A. KNOWLEDGE

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

1. Outline the anatomy, physiology and pathophysiology of the reproductive system and the common conditions affecting it.
2. Detect normal pregnancy, labour puerperium and manage the problems he/she is likely to encounter therein.
3. List the leading causes of maternal and perinatal morbidity and mortality.
4. Understand the principles of contraception and various techniques employed, methods of medical termination of pregnancy, sterilisation and their complications.
5. identify the use, abuse and side effects of drugs in pregnancy, premenopausal and post-menopausal periods.
6. describe the national programme of maternal and child health and family welfare and their implementation at various levels.
7. Identify common gynaecological diseases and describe principles of their management.
8. State the indications, techniques and complications of surgeries like

Caesarian section, laparotomy, abdominal and vaginal hysterectomy, Fothergill's operation and vacuum aspiration for M.T.P. & sterlaisation techniques and endoscopic procedures. (Basic knowledge)

B. **SKILLS**

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

1. examine a pregnant woman; recognise high risk pregnancies and make appropriate referrals.
2. conduct a normal delivery, recognise complications and provide postnatal care.
3. resuscitate the newborn and recognise congenital anomalies.
4. advise a couple on the use of various available contraceptive devices and assist in insertion in and removal of intra-uterine contraceptive devices.
5. perform pelvic examination, diagnose and manage common gynaecological problems including early detection of genital malignancies.
6. make a vaginal cytological smear, perform a post coital test and wet vaginal smear examination for Trichomonas vaginalis, moniliasis and gram stain for gonorrhoea. Colposcopy, endometrial sampliny.
7. interpretation of data of investigations like biochemical, histopathological, radiological, ultrasound etc.

C. **INTEGRATION**:

The student should be able to integrate clinical skills with other disciplines and bring about coordinations of family welfare programmes for the national goal of population control.

OBSTETRICS

1. Anatomy (common)
2. Pelvis and fetal skull
3. Physiology of ovulation
4. Fertilization and development of embryo,

5. Placenta and fetal membrane
6. The fetus
    - Fetal physiology
    - Fetal circulation and changes at birth
7. Maternal changes in pregnancy
8. Diagnosis of pregnancy
9. Fetus in normal pregnancy
10. Prenatal care and pre conceptional counseling
11. Drugs in pregnancy
12. Antepartum fetal surveillance
13. Normal labour
14. Mechanism of labour
15. Conduct of labour
16. Intrapartum fetal surveillance
17. Normal puerperium
18. Breast and lactation
19. Early pregnancy complications
    - Hyperemesis
    - Abortion
    - vesicular mole
    - ectopic pregnancy
20. Medical disorders complicating pregnancy

    Anemia

    Hypertensive disorders

    DM

    CVS

    Renal Disorders

    Thyroid dysfunctions

    Epilepsy

Liver disorders

21. Maternal infection
    - Bacterial- TB, other infections.
    - Viral
    - Protozoal
    - HIV in Pregnancy
22. Surgical conditions associated with pregnancy
    - Appendicitis, pancreatitis, Cholelithiasis, acute pain abdomen.
    - laparoscopy in pregnancy.
23. Gynecological conditions associated with pregnancy
    - Abnormal vainal discharge
    - Abnormal cervical cytology
    - Retroverted uterus
    - Fibroid, ovarian tumors, prolapsed uterus, carcinoma cervix
24. Preterm labour, PPROM, PROM
25. Intra uterine growth restriction
26. Prolonged pregnancy
27. IUFD (Intra Uterine Fetal death).
28. Multiple pregnancy
29. Antepartum haemorrhage
    - Abruptio placenta
    - Placenta previa
30. Abnormal labour
    1. Abnormalities of the passenger
        - Malpositions
            - -occipitoposterior
    2. Abnormal fetal presentation
            - -Transverse lie
            - -Oblique lie
            - -Breech
            - -Brow

- -Face
- -Compound
- -Cord Prolapse / Presentation

3. Abnormalities in the passage
    - Contracted pelvis
    - CPD
    - Abnormal pelvis
4. Dystocia due to anomalies in expulsive power –
    - Uterine inertia,
    - Inco ordinate uterine action,
    - Hypertonic uterine contractions
    - Cervical dystocia
    - Precipitate labour
    - Management of dysfunctional labour and partograph

31. Prolonged labour
    - Obstructed labour
    - Dystocia due to fetal anamolies
    - Threatened rupture and rupture uterus
32. Complications of 3rd stage of labour
    - PPH
    - Retained placenta and adherent placenta accrete
    - Inversion of uterus
    - Injuries to perineum
33. Abnormalities of puerperium
    - Puerperal pyrexia, puerperal sepsis
    - subinvolution
    - urinary and breast complications
    - venous thrombosis and pulmonary embolism
    - psychiatric disorders
    - puerperal emergencies

34. Special cases
    - Labour following cesearean
    - Rh isoimmunisation
    - Bad obstetric history
    - Teenage pregnancy
    - Elderly primi
    - Grand multipara
    - Obesity
35. Induction of labour
36. Operative obstetrics
    - Episiotomy
    - Hysterotomy
    - Cesearean section
    - laparotomy,
    - hysterectomy
    - Operative vaginal deliveries
    - Forceps
    - Ventouse
    - Version
    - Destructive operations
37. Newborn
    - Resusitation and examination of new born
    - Feeding of newborn / immunization
    - Term new born
    - Low birth weight baby
    - Preterm baby
    - Growth restricted baby
    - Macrosomic baby
    - Post term baby
38. Diseases of the fetus and new born

- Asphyxia neonatorum
- Perinatal asphyxia
- Meconium aspirartion syndrome
- Jaundice
- Seizures
- Birth injuries
- Congenital malformations and pre natal diagnosis
- Down syndrome
- Non immune hydrops

39. Pharmacotherapeutics in obstetrics
    - Oxytocics
    - Tocolytics
    - Anti hypertensives
    - Diuretics
    - Anti convulsants
    - Anti coagulants
    - Analgesia and anaesthesia in obstetrics
    - Drugs in preganancy
40. Population dynamics and contraception
    - Temporary methods
    - Permanent methods-male and female
    - Medical termination of preganancy-I ans 2nd trimester
41. Safe motherhood and epidemiology
    - RCH and
    - Safe motherhood programme
    - CSSM
    - Maternal mortality and morbidity
    - Perinatal mortality and morbidity
42. Miscellaneous
    - Shock in obstetrics

- Post partum collapse
- Blood coagulation disorders
- Immunology in obstetrics

43. Current topics
44. Audit in obstetrics
    - Legal and ethical issues
    - Antibiotic prophylaxis
    - Day care obstetrics
    - PNDT act
    - Umbilical cord stem cell banking
45. Imaging in obstetrics
    - Ultrasonogram
    - Doppler
    - MRI
    - Radiology in obstetrics
    - Amniocentesis
46. practical obstetrics
    - Instruments
    - Specimens
    - Ultrasound pictures
    - Drugs
    - Doppler pictures
    - Partogram pictures
    - CTG tracings

Gynaecology

1. Anatomy of the female pelvic organs
2. Development of female genital tract and its abnormalities
3. Physiology of menstruation , ovulation and menopause
4. Sex and intersex

5. Gynaecological diagnosis
6. Reproductive tract infections
    - STD/ PID
    - Tuberculosis of genital tract
7. Disease of the vulva –
    - benign conditions
    - inflammations
    - ulcers
    - atrophy
    - dystrophy
    - cysts
8. Disease of the vagina
    - Biology of vagina
    - Vaginal infections
    - Inflammation-vulvovaginitis in children,senile vaginitis,secondary vaginitis and rare form of vaginitis
    - Ulcerations
    - Cysts and benign neoplasm
9. Diseases of urinary system
10. Injuries of the female genital tract
11. Injuries to the intestinal tract
12. Genital fistulae and urinary incontinence
13. Pathology of conception
14. Birth control and MTP
15. Abnormal uterine bleeding-types and causes and management,DUB
16. Amenorrhoea
17. Hormonal therapy in gynaecology
18. Inflammation of uterus and cervix
19. Genital prolapsed
20. Other displacements of uterus

21. Benign lesions of uterus
22. Disorders of ovary and benign tumors
23. Endometriosis and adenomyosis
24. Diseases of parametrium
25. Premalignant lesions
    - Vulva
    - Vagina
    - Cervix
    - Endometrium
26. Genital malignancies
    - Vulval carcinoma
    - Vaginal carcinoma
    - Cervical carcinoma
    - Endometrial carcinoma
    - Gestational trophoblastic neoplasia
    - Sarcoma
    - Ovarian carcinoma
    - Fallopian tube
    - Screening in genital tract malignancies-pap smear
27. Radiotherapy in gynaecology
28. Chemotherapy in gynaecology
29. Immunotherapy and gene therapy
30. Adolescent gynaecology
31. Special topics
    - Abnormal vaginal discharge
    - Pruritus vulva
    - Pelvic pain
    - Post menopausal bleeding
    - Low back ache
    - Breast in gynaecology

- Psychosexual problems
- Vaginismus
- Dyspareunia
- Abdomino pelvic lump
- Hirsutism
- Galactorrhoea

32. Operative gynaecology
    - Pre operative preparations
    - Day care surgery
    - Post operative care
    - Gynaecological operations
    - Endometrial sampling
    - Cervical biopsy
    - Dilatation and curettage
    - Hysterectomy
    - Colposcopy
33. Endoscopic surgery in gynaecology
    - Laparoscopy
    - Hysteroscopy
34. Practical gynaecology
    - Instruments
    - Specimens
    - Imaging studies-x ray,ultrasound,computed tomography,MRI
    - Obstetrics and Gynaecology clinical examination

UNIVERSITY EXAMINATION

THEORY:

2 Papers of 100 marks each and 3 Hours Duration.

PATTERN OF QUESTION PAPER:

Marks: each paper – 100 marks

MCQs	=	20 X 1 = 20 Marks
Applied Questions	=	2 X 10 = 20 Marks
Short Answer Questions	=	12 X 5 = 60 Marks

Total: 100 Marks

Each paper will have 2 sections.

PRACTICAL MARK DISTRIBUTION

Practical mark:80

Obstetrics 40 Marks

History Taking = 10marks
Examination = 10 Marks
Discussion = 20 Marks

Gynaecology 40 Marks

History Taking = 10marks
Examination = 10 Marks
Discussion = 20 Marks

Total: 80

Viva = 20

Pelvis and fetal skull – 5 Marks
Spotters – 5 Marks
Instruments – 5 Marks
Drugs and family welfare – 5 Marks

20

INTERNAL ASSESSMENT – MARK DISTRIBUTION

I.A. MARK – 100

Theory	= 40
Practical	= 40
Record notebook	= 20

Total: 100

PASS CRITERIA:

	MAXIMUM	**MINIMUM**
Theory(Paper I & II)	200	100
Practical	80	40
Viva	20	-
Practical + Viva	100	50
Internal Assessment	100	40
GRAND TOTAL:	400	200

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A COMPREHENSIVE LIST OF SKILLS RECOMMENDED AS DESIRABLE FOR BACHELOR OF MEDICINE AND BACHELOR OF SURGERY (MBBS) GRADUATE:

I. **Clinical Evaluation**:

a. To be able to take a proper and detailed history.
b. To perform a complete and thorough physical examination and elicit clinical signs.
c. To be able to properly use the Stethoscope, Blood Pressure Apparatus, Autoscope, Thermometer, Nasal Speculum, Tongue Depressor, Weighing Scales, Vaginal Speculum etc.;
d. To be able to perform internal examination - Per Rectum (PR), Per Vaginum (PV) etc.;
e. To arrive at a proper provisional clinical diagnosis.

II. **Bed side Diagnostic Tests**:

a. To do and interpret Haemoglobin (Hb), Total Count (TC), Erythrocytic Sedimentation Rate (ESR), blood smear for parasites, Urine examination - albumin / sugar / ketone / microscopic;
b. Stool exam for ova and cysts;
c. Gram staining and Ziehl-Nielsen staining for AFB;
d. To do skin smear for lepra bacilli;
e. To do and examine a wet film vaginal smear for Trichomonas;
f. To do skin scraping and Potassium Hydroxide (KOH) stain for fungus infections;
g. To perform and read Mantoux Test.

III. **Ability to carry out Procedures**:

a. To conduct CPR (Cardiopulmonary resuscitation) and First aid in newborns, children and adults.
b. To give Subcutaneous (SC) / Intramuscular (IM) / Intravenous (IV) injections and start Intravenous (IV) infusions.
c. To pass a nasogastric tube and give gastric lavage.
d. To administer oxygen - by mask / catheter

e. To administer enema
f. To pass a urinary catheter - male and female
g. To insert flatus tube
h. To do pleural tap, ascitic tap & lumbar puncture
i. Insert intercostal tube to relieve tension pneumothorax
j. To relieve cardiac tamponade
k. To control external haemorrhage.

IV. **Anaesthetic Procedures**:

a. Administer local anaesthesia and nerve block
b. Be able to secure airway patency and administer Oxygen by Ambu bag.

V. **Surgical Procedures**:

a. To apply splints, bandages and Plaster of Paris (POP) slabs;
b. To do incision and drainage of abscesses;
c. To perform the management and suturing of superficial wounds;
d. To carry on minor surgical procedures, e.g. excision of small cysts and nodules, circumcision, reduction of paraphimosis, debridement of wounds etc.;
e. To perform vasectomy;
f. To manage anal fissures and give injections for piles.

VI. **Mechanical Procedures**:

a. To perform thorough antenatal examination and identify high risk pregnancies.
b. To conduct normal delivery;
c. To apply low forceps and perform and suture episiotomies;
d. To insert and remove IUDs and perform tubectomy.

VII. **Paediatrics**:

a. To assess new born and recognize abnormalities and intra uterine retardation;
b. To perform immunization;
c. To teach infant feeding to mothers;
d. To monitor growth by the use of "***road to health chart"*** and to recognize development retardation;

e. To assess dehydration and prepare and administer Oral Rehydration Therapy (ORT);

f. To recognize acute respiratory infection clinically.

VIII. **ENT Procedures**:

a. To be able to remove foreign bodies;

b. To perform nasal packing of epistaxis;

c. To perform tracheostomy;

IX. **Ophthalmic Procedures**:

a. To evert eye-lids;

b. To give Subconjunctival injection;

c. To perform epilation of eye-lashes;

d. To measure the refractive error and advise correctional glasses;

e. To perform nasolacrimal duct syringing for patency.

X. **Dental Procedures**:

a. To perform dental extraction.

XI. **Community Health**:

a. To be able to supervise and motivate community and para-professionals for corporate efforts for the health care;

b. To be able to carry on managerial responsibilities; e.g. Management of stores, indenting and stock keeping and accounting;

c. Planning and management of health camps;

d. Implementation of national health programmes;

e. To effect proper sanitation measures in the community; e.g. disposal of infected garbage and chlorination of drinking water;

f. To identify and institute control measures for epidemics including its proper data collecting and reporting.

XII. **Forensic Medicine including Toxicology**:

a. To be able to carry on proper medicolegal examination and documentation of injury and age reports;

b. To be able to conduct examination for sexual offences and intoxications;

c. To be able to preserve relevant ancillary materials for medicolegal examination;

d. To be able to identify important post-mortem findings in common un-natural deaths.

XIII. **Management of Emergencies**:

a. To manage acute anaphylactic shock;
b. To manage peripheral vascular failure and shock;
c. To manage acute pulmonary oedema and left ventricular failure;
d. Emergency management of drowning, poisoning and seizures;
e. Emergency management of bronchial asthma and status asthmaticus;
f. Emergency management of hyperpyrexia;
g. Emergency management of comatose patients regarding airways, positioning - prevention of aspiration and injuries;
h. Assess and administer emergency management of burns.

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