

INSTITUTE OF SCIENCE, TECHNOLOGY & ADVANCED STUDIES (VISTAS)
(Deemed to be University Estd. u/s 3 of the UGC Act, 1956)
PALLAVARAM - CHENNAI
ACCREDITED BY NAAC WITH 'A' GRADE
Marching Beyond 30 Years Successfully

B.Sc. MEDICAL LABORATORY TECHNOLOGY

Curriculum and Syllabus 2023

(Based on Choice Based Credit System (CBCS)
and Outcome Based Education (OBE)
Effective from the Academic year2023-2024

School of Allied Health Sciences

1. SHORT TITLE AND COMMENCEMENT:

These regulations shall be called "Specific Regulations for the B.Sc. Medical Laboratory Technology course of Vels Institute of Science Technology and Advanced Studies, Deemed to be University u/s3 of UGC act 1956. These Regulations are applicable to the students who are admitted to the B.Sc. Medical Laboratory Technology in this University.

As per the decision of the Academic Council of this University, these regulations have been prepared by adopting the regulations of the VISTAS.

2. AIMS

The aim of the course is to

A thorough study of Medical Lab Technology
Working on laboratory research works
Involvement in internships
Real-world projects and training
Study of Human Anatomy and Physiology

3. OBJECTIVES

On completion of the four years B.Sc. Medical Laboratory Technology Programme the graduates will be:

- Efficiency in using modern techniques and technologies for providing vision care.
- Demonstrating professional and clinical competence in the practice.
- Strengthening the critical acumen of students to work efficiently in inter-disciplinary and multi-disciplinary health care projects
- Nurturing their skills and preparing them for the optical clinic industry & trade

4. ELIGIBILITY FOR ADMISSION

1. The minimum age for admission shall be 17 years on or before 31st December of the year in which admission is sought.

2. A Candidate desiring to join the B.Sc. Medical Laboratory Technology course should have passed the HSC/CBSE/ISC or other equivalent examination with one of the following subject combinations:

   i) Physics, Chemistry, Biology & Mathematics

   ii) Physics, Chemistry, Botany & Zoology.

3. A candidate is required to obtain 50% in the Entrance exam conducted by the VISTAS

5. DURATION OF THE COURSE:

The duration of the B.Sc. Medical Laboratory Technology Degree course shall be 4 Years full-time programme comprising 8 Semesters including internship (Three Year Curriculum + One Year Internship) under Choice based Credit System.

6. MEDIUM OF INSTRUCTION:

English shall be the medium of instruction for all subjects of study and examinations will be conducted only in English.

7. COMMENCEMENT OF THE COURSE:

The course shall commence on August of the academic year.

8. WORKING DAYS IN A SEMESTER:

Each semester shall consist of not less than 100 working days and each academic year shall have a total of 200 working days

9. REGISTRATION

A Candidate admitted to the course shall be registered by remitting the prescribed fees along with the Application form for registration duly filled with in the stipulated dates.

10. COMMENCEMENT OF THE EXAMINATIONS:

Regular Semester Examinations will commence from last week of November and last week of April

If the date of commencement of the examination falls on Saturday, Sunday or declared Public Holidays, the examination shall begin on the next working day.

B.Sc MEDICAL LABORATORY TECHNOLOGY CURRICULUM

SEMESTER 1

Sl. No.	Category	Course Titles	Hours/Credits							Maximum Marks				
			Lecture		Tutorial		Practical		Total	IA		UA		TOTAL
			Hours	Credits	Hours	Credits	Hours	Credits	Credits	Theory	Practical	Theory	Practical	
1.1	Program Core	General Anatomy	45	3	30	1	60	2	6	25	50	75	50	200
1.2	Program Core	General Physiology	45	3	30	1	60	2	6	25	50	75	50	200
1.3	Program Core	General Biochemistry	45	3	30	1	60	2	6	25	50	75	50	200
1.4	Program Elective	Medical Law and Ethics*	30	2	-	-	-	-	2	100	-	-	-	100
1.5	Program Elective	Communication And Soft Skills*	30	2	-	-	-	-	2	100	-	-	-	100
Total									**22**	**Total**				**800**

SEMESTER 2

Sl. No.	Category	Course Titles	Hours/Credits							Maximum Marks				
			Lecture		Tutorial		Practical		Total	IA		UA		Total
			Hours	Credits	Hours	Credits	Hours	Credits	Credits	Theory	Practical	Theory	Practical	
2.1	Program Core	General Pathology	45	3	30	1	60	2	6	25	50	75	50	200
2.2	Program Core	General Microbiology	45	3	30	1	60	2	6	25	50	75	50	200
2.3	Program Core	General Pharmacology	45	3	30	1	60	2	6	25	50	75	50	200
2.4	Program Elective	Medical Terminology*	30	2	-	-	-	-	2	100	-	-	-	100
2.5	Program Elective	Basic Computers & Information Science*	30	2	-	-	-	-	2	100	-	-	-	100
Total									**22**	**Total**				**800**

SEMESTER 3

Sl. No.	Category	Course Titles	Hours/Credits							Maximum Marks				
			Lecture		Tutorial		Practical		Total	IA		UA		Total
			Hours	Credits	Hours	Credits	Hours	Credits	Credits	Theory	Practical	Theory	Practical	
3.1	Program Core	Histopathology	45	3	30	1	60	2	6	25	50	75	50	200
3.2	Program Core	Cytology	45	3	30	1	60	2	6	25	50	75	50	200
3.3	Program Elective	Psychology*	30	2	-	-			2	100			-	100
3.4	Program Elective	Basic principles of hospital management	30	2	-	-	-	-	2	100	-	-	-	100
3.5	Program Core	MLT Directed Clinical Education	-	-	-	-	120	4	4	50	50	-	-	100
Total									**20**	**Total**				**700**

SEMESTER 4

Sl. No.	Category	Course Titles	Hours/Credits							Maximum Marks				
			Lecture		Tutorial		Practical		Total	IA		UA		Total
			Hours	Credits	Hours	Credits	Hours	Credits	Credits	Theory	Practical	Theory	Practical	
4.1	Program Core	Clinical pathology (Haematology &Urine analysis)	45	3	30	1	60	2	6	25	50	75	50	200
4.2	Program Core	Blood Banking & Immunology	45	3	30	1	60	2	6	25	50	75	50	200
4.3	Program Elective	Medical Sociology*	30	2	-	-	-	-	2	25		75	-	100
4.4	Program Elective	Health Care management Theory*	30	2	-	-	-	-	2	25	-	75	-	100
4.5	Program Core	MLT Directed Clinical Education	-	-	-	-	120	4	4	50	50	-	-	100
Total									**24**	**Total**				**700**

SEMESTER 5

Sl. No.	Category	Course Titles	Hours/Credits							Maximum Marks				
			Lecture		Tutorial		Practical		Total	IA		UA		Total
			Hours	Credits	Hours	Credits	Hours	Credits		Theory	Practical	Theory	Practical	
5.1	Program Core	General Bacteriology, Immunology & Systematic Bacteriology	45	3	30	1	90	3	7	25	50	75	50	200
5.2	Program Core	Virology, Mycology & Parasitology	45	3	30	1	90	3	7	25	50	75	50	200
5.3	Program Elective	Hospital products, promotions, sales & public relations.*	30	2	-	-			2	100		-	-	100
5.4	Program Core	MLT Directed Clinical Education	-	-	-	-	120	4	4	50	50	-	-	100
Total									**20**	**Total**				**600**

SEMESTER 6

Sl. No.	Category	Course Titles	Hours/Credits							Maximum Marks				
			Lecture		Tutorial		Practical		Total	IA		UA		Total
			Hours	Credits	Hours	Credits	Hours	Credits	Credits	Theory	Practical	Theory	Practical	
6.1	Program Core	Clinical chemistry -I	45	3	30	1	60	2	6	25	50	75	50	200
6.2	Program Core	Clinicalchemistry – II	45	3	30	1	60	2	6	25	50	75	50	200
6.3	Program Elective	Trauma life & Cardiac care support	30	2	-	-			2	25	-	75	-	100
6.4	Program Elective	Bio-Statistics and Research Methodology Theory*	30	2	-	-	-	-	2	100	-	-	-	100
6.5	Program Core	MLT Directed Clinical Education	-	-	-	-	120	4	4	50	50	-	-	100
Total									**20**	**Total**				**700**

SEMESTER 7 & 8

Sl. No.	Category	Course Titles	Hours/Credits				Maximum Marks				Total
							IA		UA		
			Theory	Tutorial	Practical	Total	Theory	Practical	Theory	Practical /Viva	
7.1	Project	Project	-	2	-	2	-	50	-	50	100
7.2	Internship	Internship	-	38	-	38	-	50	-	50	100
Total						**40**	**Total**				**200**

11. SUBMISSION OF LABORATORY RECORDNOTE BOOKS:

At the time of practical examination, each candidate shall submit to the examiners his / her laboratory note books duly certified by the Head of the Department as a bonafide record of the work done by the candidate

12. INTERNALASSESSMENT:

a) A minimum of two written internal assessment examinations shall be conducted in each subject during a semester and the Best / Average marks of two examinations shall be taken into consideration for the award of internal marks.

b) A model practical examinations shall be conducted in each subject (wherever practical have been included in the curriculum) shall be taken into consideration for award of internal marks in practical.

c) Tests will be conducted giving sufficient time for preparation.

d) No repeat, reschedule and postponement of the assessment date is permitted .Students shall compulsorily attend anythree continuous assessments

13. ATTENDANCEREQUIRED FOR ADMISSION TO EXAMINATIONS:

a) No candidate shall be permitted to appear forthe University examinations,unless he/she attends the course for the prescribed period.

b) Every candidate is required to put in a minimum of 80% of attendance bothin theory and practical separately in each subject for admission to the examination.

c) A candidate lacking in the prescribed attendance in any subject in theory and /or practical shall not be admitted to the entire examination.

14. CONDONING LACK OF ATTENDANCE

Condoning of shortage of attendance up to a maximum of 10% in the prescribed eligible attendance for admission to year end examination rests 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, 15days prior to the commencement of the theory examination, The Head of the Department should satisfy

himself on the reasonableness of the candidate's request while forwarding the application of the candidate to the Controller of Examinations, who would obtain the Vice – Chancellor's approval for admission to the examination. No application would be accepted if it is not forwarded through proper channel.

1. Condoning lack of attendance should be taken up for consideration under the following circumstances:-

a) Any illness affecting the candidate – Candidates should submit a medical certificate from registered medical practitioners.

b) Any unforeseen tragedy in the family. The parents/ guardian should give inwriting about what had happened.

c). Participation in National Service Scheme and other co-curricular activities representing the University.

15. RE-ADMISSION AFTER BREAK OF STUDY:

A separate regulation is available for all the UG/PG courses of this university for there admission of candidates after a break of study.

16. INTERNSHIP

- Internship means 8 hours of integrated clinical duties
- Internship should be carried out as 8 Hours per day @ 48 hours per week
- Studentswill be supervised by the Faculties & well Trained Professionals during Internship.
- Internship will be started after passing in the third year Examination.

17. YEAR END EXAMINATIONS

- Commencement of the Examination will be in November /April
- If the date of commencement falls on Saturdays, Sundays or declared public holidays, the examination shall begin on the next working day.
- The duration of the examination of each subject is 3hours.

Carryover of failed subjects:

- A candidate has to pass in theory and practical examinations separately in

each ofthe subject.

- If a candidate fails in either theory or practical of the subjects, he/she has to reappear for both the Theory and Practical.
- The candidate if fails can be permitted for admission to next year.
- The candidate shall have to clear all the previous examination before appearing for the Sixth Semester examination.

18. REVALUATION / RETOTALLING OFANSWER PAPERS:

There is provision for revaluation of the answer papers of failed candidates in any examination. However, the failed candidates cannot apply for retotaling.

19. CREDITS

Credits will be assigned on the basis of the lectures (L) /tutorials (T) Clinical Training (CR) /laboratory work (P) /Research Project (RP) and other form of learning in a 15-20week schedule.

- L- One credit for one hour lectur1e2per week (1 credit = 15 hours)
- P/T– One credit for every two hours of laboratory or practical (1 credit = 30 hours)
- CR – One credit for every two hours of Clinical Training/Clinical Rotation/Posing (1 credit = 30 hours)
- RP – One credit for every two hours of Research Project per week – Max Credit20-25 (1 credit =30 hours)

20. GRADING SYSTEM

Based on the performance, each student shall be awarded a final grade at the end of the semester for each course. Absolute grading is used by converting the marks to grade, based on pre determined class intervals.
UGC 10-point grading system is used with pass grade modified.

Letter Grade	Grade Point	Range of Marks*
O (Outstanding)	10	85% & above
A+ (Excellent)	9	80-84.99%
A (Very Good)	8	75-79.99%
B+ (Good)	7	65-74.99%
B (Above Average)	6	60-64.99%
C (Average)	5	50-59.99%
P(Pass)	-	>50%
F (Fail) / RA (Reappear)	0	<49.99%
AB (Absent)	0	0

1. A candidate is declared to have pass in a course if he /she secures a minimum 50% marks the university theory & practical Examinations separately & 50% in aggregate of university theory/practical & Internal assessment put together

Computation of Semester Grade Point Average (SGPA) and Cumulative Grade Point Average (CGPA):

SPGA is the weighted average of the grade points obtained in all courses by the student during the

semester

SGPA Computation:

$$SGPA = \frac{\sum_{i}^{n} (C_i \times (GP)_i}{\sum^{n} C_i}$$

Wheíe C_i - cíedits foí the couíse, $(GP)_i$ - the gíade point obtained foí the i^{th} couíse , n – total numbeí of couíses and the sum is oveí all the couíses taken in that semesteí, including those in which the students has secuíed "F" and "Ab" gíades.

CGPA Computation:

Computation of CGPA:

CGPA is calculated with SGPA of all semesters to two decimal points and is indicated in final grade in mark card/transcript showing grades of all 8 semesters and their courses/subjects.

$$CGPA = \frac{\sum^{\acute{i}}_{i} S_i \times (SGPA)_i}{\sum^{\acute{i}}_{i} S_i}$$

where:-S_i- sum of credits in i^{th} semester , $(SGPA)_i$- semester grade point average earned in i^{th} semester and r- number of semester and the sum is over all the semesters under consideration. The cumulative grade point average (CGPA) is calculated by consideration all the courses taken from the first semester onwards for regular students and from third semester onwards taken for lateral entry students.

21. CLASSIFICATION OF SUCCESSFUL CANDIDATES:

The CGPA arrived at the completion of the course shall be the criteria for theclassification of successful candidates as below:

Cumulative Grades and Grade Points

Letter Grade	Grade Point	Range of Marks*
O (Outstanding)	10	85% & above
A+ (Excellent)	9	80-84.99%
A (Very Good)	8	75-79.99%
B+ (Good)	7	65-74.99%
B (Above Average)	6	60-64.99%
C (Average)	5	50-59.99%
P(Pass)	-	>50%
F (Fail) / RA (Reappear)	0	<49.99%
AB (Absent)	0	0

a) Successful candidates who secure 75% marks and above as a course aggregate in the first appearance taking University theory, practical, project / dissertation evaluation and viva shall alone be awarded Distinction. This will also apply for award of University rank.

b) Successful candidates who secure 60% marks and above as a course aggregate in the University theory, practical, project / dissertation evaluation and viva shall be awarded First Class.

c) All others who secure 50-59% in gross percentage will be classified to have passed inSecond Class.

22. PATTERN OF QUESTION PAPER FOR UNIVERSITYEXAMINATION:

EXAMINATION QUESTION PAPER PATTERN

Essay	**2 x 15**	**= 30 Marks**
Short Notes	**7 x 5**	**= 35 Marks**
Short Answers	**5 x 2**	**= 10 Marks**
Total		**75 Marks**

Internal Split up – Theory

1. Continuous Assessment: 10 Marks

S.no	Continuous Assessment	Marks
1	Attendance	5
2	Assignment	5

2. Internal Assessment: 15 marksTwo Sessional Exams per Course

Internal Split up – Practical

1. Continuous Assessment: 20 Marks

S.no	Continuous Assessment	Marks
1	Seminar	10
2	Record note Book	10

2. Model Practical Examination: 30 Marks

23. GRACE MARKS

Maximum of 8 grace marks for each subject is permitted, and grace marks should notexceed 8 marks in each subjects.

24. MARKS QUALIFING FOR PASS

A candidate is declared to have passed in a course if he/she secures a minimum of 50% marks in university theory and practical examinations separately and 50% in aggregate of university theory /practical and internal assessment put together.

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FIRST SEMESTER
GENERAL ANATOMY

Course objectives:

- Describe the structure and functions of the organ systems of the human body.
- Describe how the organ systems function and interrelate.
- Learn basic technical terminology and language associated with anatomy.
- Develop a self-identity of what it means to be "human".

Unit I: Organization of the Human Body

Introduction to the human body - Definition and subdivisions of anatomy- Anatomical position and terminology Regions and Systems of the body -Cavities of the body and their contents - Levels of organization of the body. Cell – Definition of a cell, shapes and sizes of cells - Parts of a cell – cell membranes cytoplasm, subcellular organelles and their main functions. Cell Division – Definition and main events that occur in different stages of mitosis and meiosis. Tissues – Tissues of the body - Definition and types of basic tissues - Characteristics, functions and locations of different types of tissues.

Unit II: Systems of Support and Movement

1. **Skeletal system** Skeleton – Definition, axial and appendicular skeleton with names and number of bones, Types of bones. Parts of bones. Functions of bones. Name location and general features of the bones of the body. Joints – Definition and types of joints with examples. Axes and kind of movements possible. Name, location, type, bones forming, movements possible.
2. **Muscular system** Parts of the skeletal muscle. Definition of origin and insertion. Name and location of the skeletal muscles of the body. Origin, insertion, nerve supply and action of large muscles like sternocleidomastoid, pectoralis major, deltoid, Biceps brachii, Triceps brachii, gluteus, gastrocnemius and diaphragm.

Unit III: Control Systems of the Body

1. **Nervous system** Sub-divisions of the nervous system , Spinal cord – Location, extent, spinal segments, external features and internal structure. Brain – Sub- divisions, location external features of medulla oblongata, pons, mid-brain, cerebellum and cerebrum. Meninges and spaces around them. Name and location of ventricles of brain and circulation of cerebrospinal fluid. Blood supply of the brain and spinal cord. Cranial nerves - Name, number, location and general distribution. Spinal nerves - Typical spinal nerve groups and number of spinal nerves. Name and location of cervical plexus and brachial plexus. Location and general distribution of the branches.

Autonomic Nervous system – definition and functions.

2. **Sense organs** Locationand features ofthe nose, tongue, eye, ear and skin

3. **Endocrine system** Names of the endocrine glands. Location and features of pituitary, thyroid, parathyroid, suprarenal, pancreas, ovaries and testes. Names of hormones produced by each gland.

Unit IV: Maintenance of the Human Body

1. **Cardio-vascular system:** Types and general structure of blood vessels. Structure and types of arteries and veins. Structure of capillaries. Shape, size, location, coverings, external and internal features of heart. Structure of heart wall, conducting system of the heart. Blood supply of the heart. The systemic arteries and veins. Name, location, branches and main-distribution of principal arteries and veins.

2. **Lymphatic system** Lymph, lymphatic vessels, name, location and features of the lymphatic organs.

3. **Respiratory system:** Names of organs of respiration, Location and features of nose, pharynx, larynx, trachea, bronchi, lungs and pleura.

Unit V: Excretion of the Human Body

1. **Digestive system:** Names of organs of digestion. Parts of alimentary canal and accessory organs. Location and features of mouth, pharynx, esophagus, stomach, small and large intestines. Location and features of salivary glands, pancreas, liver and gall bladder.

2. **Urinary system:** Names of urinary organs, location and features of kidney, ureter, urinary bladder and urethra

Unit VI: Reproduction Function of the Human Body

1. Reproductive system Names of male and female organs of reproduction. Location and features of scrotum, testis, epididymis, vas deferens, seminal vesicle, ejaculatory duct, prostate gland, penis and spermatic cord. Location and features of uterus and its supports, uterine tube, ovary vagina vulva and breast.

Anatomical Regions Simple ideas about scalp, triangles of neck, axilla, cubital fossa, mediastinum, inguinal canal, femoral triangle, popliteal fossa.

Practicals and Demonstrations:

1. Identification of the parts of the microscope.
2. Identification of the epithelium in a given histological slide.
3. Demonstrate the parts of the long bone.
4. Identification of the bones and joint of the body with the articular surfaces (skeleton or X-rays)
5. Identification of the important muscles in upper limb, lower limb and head and neck.
6. Identification of the parts of the brain (cerebrum, cerebellum, brainstem, spinal cord)
7. Identification of the cardiac chambers in a specimen.
8. Identification of the major vessels of heart – aorta and pulmonary trunk.
9. Identification of the cardiac field in chest X-ray.
10. Identification of the nasal cavity, naso pharynx, trachea, lung and pleura in a given specimen.
11. Identification of the lung shadow, costophrenic angle in a chest X-ray.
12. Identification of the stomach, pancreas, liver, small intestine and large intestine specimens.
13. Identification of the stomach, intestinal shadows in plain or contrast abdomen X – ray.
14. Identification of the kidney, Ureter and urinary bladder in specimen.
15. Identification of the renal pelvis, Ureter and urinary bladder in intravenous pyelogram
16. Identification of the thyroid gland in cadaveric specimen

Recommended books:

1. MARIANO S.H. DIFIORE: Atlas of Human Histology, 5th Ed. 1981, Lea andFeliger
2. B.D. CHAURASIA: Handbook of General Anatomy, 2nd Ed., CBS Publishersand Distributors, New Delhi - 110 032.

GENERAL PHYSIOLOGY

Course Objectives:

- Comprehend basic terminologies used in the field of Human Physiology
- Define and describe basic Physiological Processes governing the normal functioning of the human body
- Applythis knowledge in their Allied Health Science practice

UNIT I: GENERAL PHYSIOLOGY

Concept of Homeostasis - Cell structure and functions -Transport across membranes

Nerve structure, classification of nerve fibres, Muscles- classification, structure, Neuro-Muscular junction (NMJ), Muscle contraction – mechanism, types.

Body fluid volumes, compartments, and composition - Blood composition and functions - Plasma proteins – Erythrocytes – Morphology and functions , Leucocytes – Morphology and functions, Platelets- Morphology and functions Blood groups.

UNIT II: DIGESTIVE SYSTEM, SKIN & EXCRETORY SYSTEM

Salivary glands- Nerve supply, functions of saliva, Gastric juice- composition & functions of gastric juice. Pancreatic juice – composition, functions and regulation of Pancreatic juice, Bile – composition, functions of bile & bile salts. Succusentericus and small intestinal movements, Deglutition, vomiting, functions of large intestine

Structureofsweat glands; temperature regulation

Structure of Nephron and its blood supply, Juxta Glomerular Apparatus (JGA) Formation of urine- Filtration, Reabsorption & Secretion, Counter-Current mechanism, Micturition.

UNIT III: ENDOCRINE SYSTEM & REPRODUCTION

Hypothalamohypophyseal inter relationship - Anterior pituitary hormones and their functions - Posterior pituitary hormones and their actions - Thyroid hormones, biosynthesis and functions - Parathyroid hormones, functions Insulin, Glucagon, actions and Diabetes mellitus - Adrenal cortex hormones and their functions. Adrenal medullary hormones and their actions

Male reproductive organs - Spermatogenesis and Testosterone actions, Female reproductive organs - Menstrual cycle

UNIT IV: RESPIRATORY SYSTEM

Structure of upper and lower respiratory tract. Muscles of respiration and Mechanism of respiration. Lung volumes and capacities – definitions, normal values, intra pulmonary and intra pleural pressures, surfactant Oxygen transport, Carbon-dioxide transport - Neural and chemical regulation of respiration - Hypoxia, cyanosis

UNIT V: CARDIOVASCULAR SYSTEM

Cardiac muscle, action potential &conducting system of the heart, Cardiac cycle, ECG, heart sounds Cardiac output-Definition, factors regulating cardiac output and measurement of cardiac output. Blood pressure – Definition, measurement, factors maintaining B.P, Regulation of B.P, Regional circulation – Coronary and Cerebral

UNIT VI: NERVOUS SYSTEM & SPECIAL SENSES

Structure & Properties of Neuron - Nerve – Classification, injury -Types and properties of Receptors Synapse and synaptic transmission, Reflex and its properties ,Spinal cord – Ascending & Descending tracts Thalamus, Basal ganglia, Cerebellum, Cerebral cortex, Hypothalamus & Cerebrospinal fluid - Autonomic nervous system.

Vision, Audition, Olfaction, Gustation

Practical:

1. Recording of Arterial Blood Pressure (BP)

Practical Demonstration:

1. Determination ofRBC count
2. Determination ofWBC count
3. Differential leucocyte count (DLC)
4. Determination of Hb, PCV & ESR.
5. Determination of Blood groups, Bleeding and clotting time.
6. Charts & Instruments – Spotters

Recommended Book

Basics of Medical Physiology(Third edition) by D. Venkatesh/ H.H. Sudhakar

GENERAL BIOCHEMISTRY

Course Objectives:

To have a knowledge about the chemistry and metabolism of various macromolecules-carbohydrate, protein and lipids

- To learn about enzymes, vitamins, minerals and nutrition
- To know the structure and function of Haemoglobins, Nucleic acids.
- To learn about the organ function tests like Liver Function Tests and Renal Function Tests.

Unit – I: Carbohydrates

Classification of carbohydrates and their biological importance, reducing property of sugars.

Metabolism of Carbohydrates : Digestion and Absorption of carbohydrates, steps of Glycolysis and energetics, steps of TCA cycle and energetics, steps of Glycogen synthesis and breakdown, significance of HMP shunt pathway, definition and steps of Gluconeogenesis, Galactose metabolism , Diabetes mellitus , Galactosemia.

Bioenergetics: Importance of ATP, outline of respiratory chain

Unit – II: Lipids

Classification of lipids, essential fatty acids, functions of cholesterol, triglycerides, and phospholipids

Metabolism of Lipids : Digestion and Absorption of lipids, steps of β oxidation of fatty acids, types and functions of lipoprotein, Lipid profile, hyper cholesterolemia

Haemoglobin: Structure and functions of Haemoglobin.

Unit – III: Proteins

–Classification of amino acids, structure of proteins, plasma proteins, immunoglobulins.

Metabolism of Proteins: Digestion and absorption of proteins, transamination, deamination, steps of urea cycle, Phenylketonuria, Alkaptonuria, Transmethylation, products derived from Glycine and tyrosine

Nucleic acids: Structure and function of DNA & RNA, Types of RNA

Unit – IV: **Enzymes**

Definition, classification, coenzymes, factors affecting enzyme activity, Types andexamples of enzyme inhibition.

Function Tests: Liver function tests, Renal function tests

Vitamins : Classification, Fat soluble vitamins: Functions, source, deficiency manifestations of vitamin A, D E and K, Functions and deficiency manifestations of vitamin C, co-enzymic forms and deficiency manifestations of B-complex vitamins.

Unit – V: Nutrition & Minerals

Basal metabolic rate (BMR), Specific Dynamic Action (SDA), Glycemic index,Dietary fiber, Balanced diet, Protein Energy Malnutrition (PEM).

Calcium, Phosphorus, Iron, iodine. Outline ofPH homeostasis

BIOCHEMISTRY SYLLABUS FOR PRACTICALS – (UNDER – GRADUATES)

SPOTTER

Text books Recommended:

1. Textbook of Biochemistry for Paramedical Students by Dr.P.Ramamoorthy
2. Essentials of Biochemistry by U. Sathyanarayana

MEDICAL LAW AND ETHICS

Legal and ethical considerations are firmly believed to be an integral part of medical practice in planning patient care. Advances in medical sciences, growing sophistication of the modern society's legal framework, increasing awareness of human rights and changing moral principles of the community at large, now result in frequent occurrences of healthcare professionals being caught in dilemmas over aspects arising from daily practice.

Medical ethics has developed into a well based discipline which acts as a "bridge" between theoretical bioethics and the bedside. The goal is "to improve the quality of patient care by identifying, analyzing, and attempting to resolve the ethical

Problems that arise in practice". Doctors are bound by, not just moral obligations, but also by laws and official regulations that form the legal framework to regulate medical practice. Hence, it is now a universal consensus that legal and ethical considerations are inherent and inseparable parts of good medical practice across the whole spectrum.

Few of the important and relevant topics that need to focus on are as follows:

1. Medical ethics - Definition - Goal- Scope , Introduction to Code of conduct
2. Basic principles of medicalethics
3. Confidentiality
4. Malpractice and negligence
5. Rational and irrational drug therapy
6. Autonomyand informed consent
7. Right ofpatients
8. Care of the terminally ill and Euthanasia
9. Organ transplantation
10. Sentinel events

RECOMMENDED BOOKS

Medicalethics by C.M.Francis

COMMUNICATION AND SOFT SKILLS

1. Basic Language Skills: Grammar and Usage.
2. Business Communication Skills. With focus on speaking - Conversations, discussions, dialogues, short presentations, pronunciation.
3. Teaching the differentmethods of writing like letters, E-mails, report, case study, collecting the patient data etc. Basic compositions, journals, with a focus on paragraph form and organization.
4. Basic concepts & principles ofgood communication
5. Specialcharacteristics ofhealth communication
6. Types & process ofcommunication
7. Barriers ofcommunication & how to overcome

SECOND SEMESTER

GENERAL PATHOLOGY

Course objectives:

1. Describe the features of inflammation and cellular adaption, cell injury
2. Identify and describe the features of haemodynamic disorders and deficiency diseases
3. Understand and describe the pathogenesis and pathology of various systemic disorders

Unit I: Introduction

Concept ofdiseases, classification of lesions - Inflammation and repair
- Cellular adaption, Cell injury, necrosis and gangrene Haemodynamic disorders including hemorrhage, shock, embolism and thrombosis.

Unit II: Infections

Tuberculosis - Leprosyand Typhoid. **Unit III:**

Deficiency diseases Anaemias

Unit IV: Tumor Pathology

Tumors – Terminologies, Nomenclature. Differences between benign and Malignant tumors,
Tumors – Etiology, pathogenesis and spread oftumors.

Unit V: Systemic Disorders

Heart: Coronary Heart Disease (Ischemic Heart Disease) including atherosclerosis Congenital and Valvular Heart Diseases

Respiratory System- Bronchial Asthma, Emphysema, Bronchiectasis

Bone and Joints – Autoimmune diseases, septic arthritis, osteomyelitis, rheumatoid arthritis

Diseases of the Kidney - Diseases of other parts of the Urinary System

Central Nervous System CNS infections

Muscle - Diseases of muscle including poliomyelitis, myopathies

Gastrointestinal System Diseases of Esophagus, Stomach and Intestine, Diseases of Liver and Pancreas.

Reproductive system-Diseases of uterus, cervix, ovaries and testis.

Recommended Textbook:

Textbook of Pathology, Harsh Mohan, 3rd edition

Pathology Lab

Learning Objective:

The Gross specimens and instruments relevant to the disease processes and diseases taught will be shown and explained.

Unit I: Gross Specimens

1. Gangrene Bowel
2. Tuberculosis of Lung
3. Lipoma
4. Squamous cell Carcinoma of Foot
5. Infective Endocarditis
6. Left Ventricular Hypertrophy
7. Osteoclastoma
8. Osteogenic Sarcoma
9. Osteomyelitis
10. Chronic Pyelonephritis-Kidney

Unit II: Haematology Instruments:

1. Sahli`s Haemoglobinometer
2. Sahli`s pipette
3. Westergren`s tube
4. Wintrobe`s tube
5. Neubauer`s Chamber

6. RBC pipette
7. WBC pipette

GENERAL MICROBIOLOGY

Course Objective:

At the end ofthe semester the students should be able to,

1. Know the concepts ofsterilization and disinfection procedures and their applications.
2. Understand the basic principles of immunology.
3. Understand the basic fundamentalaspects of bacteria, virus, fungus and parasites, and study the common disease caused by them.

Unit I: Introduction

Historyand introduction to microbiology, studythe morphology ofbacterial cell and their functions.

Unit II: Basic concepts about infection

Source, portalofentry& spread of immunity, biomedical wastemanagement and standard precautions

Unit III: Sterilization

Sterilization and disinfection procedures and their application.

Unit IV: Infections

Commonbacterial, viral, fungaland parasitic pathogens and the diseases caused by them with preventive and treatment measures.

Unit V: Applied microbiology

Sexually transmitted diseases, hospital acquired infections, urinary tractinfections, skin and soft tissue infections and anaerobic infections.

Recommended books

1. Prof CP Baveja - Text book ofMicrobiology.
2. Satish Gupte- Text Book of Microbiology

Microbiology Lab

Learning Objective:

This module aims at providing practicalknowledge in the recognition ofcommon pathogenicorganisms, infectious diseases and their lab diagnosis.

1. Spotters:

a) Disposable syringe

b) Sterile cotton swab

c) Bacterial filters

d) Anaerobic jars

e) Gramstained smears showing grampositive cocciand gram negative bacilli

f) Gramstained smears showing Candida

g) Culture growth of Aspergillus and dermatophytes

h) Bacterialculture media plates (Blood agar, chocolate agar and MacConkey's agar)

i) Antibiotic susceptibility test

j) Ascaris lumbricoides

k) Taenia

2. Clinical case discussion with charts:

a) Skinand soft tissue infections

b) Clostridia infections

c) Ringworm/ Tinea infections

d) Food poisoning

e) Gastroenteritis

Learning outcomes:

At the end of the module, the student must be able to have briefpracticalknowledge on infectious disorders.

Recommended reading

Practical Microbiology - Prof. C.P.Baveja

GENERAL PHARMACOLOGY

Course Objectives:

1. To understand the terminologies and basic principles of pharmacokinetic and pharmacodynamics involved in the use of drugs.
2. To understand the pharmacological action and mechanism of action of common drugs used for different disease conditions.
3. To know the therapeutic uses and adverse effects of common drugs used for different disease conditions

UNIT 1: Introduction

General pharmacological principles-Definition-Routes of drug administration-Pharmacokinetics-Pharmacodynamics-Adverse drug effects

UNIT 2: Drugs acting on Autonomic Nervous System, Peripheral Nervous System and Drugs acting on Central Nervous system

General considerations-Cholinergic system & drugs-Anticholinergic drugs- Adrenergic drugs-antiadrenergic drugs-Drugs acting on autonomic ganglia.

Skeletalmuscle relaxants-Localanaesthetics, Generalanaesthetics -Ethyl & Methyl alcohol-Sedatives, Hypnotics

Antiepileptics-Antiparkinsonian drugs-Drugs used in mental illness-Opioid analgesics and Nonopioid Analgesics

Nonsteroidal Anti-inflammatory drugs

UNIT 3: Cardiovascular drugs, Drugs affecting Blood & Blood formation and Drugs onRespiratory system

Cardiac glycosides, Antiarrhythmic drugs, Antianginal drugs, Anti-hypertensives and Diuretics, Hematinic, Erythropoietin, Drugs affecting-coagulation, Fibrinolytic and Antiplateletdrugs, Treatment of cough and anti-asthmatic drugs

UNIT 4: Antimicrobial drugs

General consideration-Antibiotics-Antibacterial agents-Antitubercular drugs- Antifungal-Antipyretic-Antiviral-Antimalarial Antiamoebic-Antiprotozoal drugs- Cancer Chemotherapy, Antiseptic-Disinfectant-others.

UNIT 5: Hormones & related Drugs, Drugs used in gastrointestinal diseases &miscellaneous drugs

Corticosteroids, Antithyroid drugs and Drugs for Diabetes Mellitus, Treatment of Vomiting, Constipation, Diarrhea and Treatment of peptic ulcer Vitamins, Vaccines, Sera andchelating agents.

Recommended books:

1. Prep Manual for Undergraduates in Pharmacology by Tara V Shanbag, 2nd edition
2. Pharmacology for Dentaland Allied Health Sciences byPadmajaUdaykumar, 3rd edition

Learning Objective:

This module is intended to discuss the various modalities ofdrug delivery and instruments relevant to it.

Instruments:

Needles Intravenous, Intrathecal, Spinal, Intra arterial

Students Discussion: Syringes, Tuberculin, Insulin, I.V cannula, Scalp. Vein set

Students Discussion: Enema can, Inhalers, Spacers, and Nebulizers **Students**

Discussion: Tablets – Enteric coated, Sustained release, Sub-lingual **Students**

Discussion: Capsules, Spansules, Pessary, Suppository

Students Discussion: Topical Preparation, Ointment, Lotion, Powder, Drops – eye / ear

Charts: Mechanism of action of drugs, adverse effects, toxicology

Spotters: drugs

Text books suggested for reading:

1. Text book of pharmacology for Dental &Allied Health Science 2rd edition PadmajaUdaykumar
2. Pharmacology for dentalstudents Tara V Shanbhag, SmitaShenoy, VeenaNayak
3. Principles ofpharmacology 2rd edition H.L.Sharma& KK Sharma

MEDICAL TERMINOLOGIES AND RECORD KEEPING

This course introduces the elements of medical terminology. Emphasis is placed on building familiarity with medical words through knowledge of roots, prefixes, and suffixes. Topics include: origin, word building, abbreviations and symbols, terminology related to the human anatomy, reading medical or dread reports, and terminology specific to the student's field of study. Spelling is critical and will be counted when grading tests.

Topics to be covered under the subject are as follows:

1. Derivationof medicalterms.
2. Definewordroots, prefixes, and suffixes.
3. Conventions for combined morphemes and the formationofplurals
4. Formmedicaltermsutilizing roots, suffixes, prefixes, and combiningroots.
5. Interpret basic medical abbreviations/symbols.
6. Utilize diagnostic, surgical, and procedural terms and abbreviations related to the integumentary system, musculoskeletal system, respiratory system, cardiovascular system, nervous system, and endocrine system.
7. Interpret medicalorders/reports.
8. Data entryand management onelectronic healthrecord system.

BASIC COMPUTERS AND INFORMATION SCIENCE

The students will be able to appreciate the role of computer technology. The course has focus on computer organization, computer operating system and software, and MS windows, Word processing, Excel data work sheet and PowerPoint presentation. Topics to be covered under the subject areas follows:

1. Introduction to computer: Introduction, characteristics of computer, block diagram of computer, generations of computer, computer languages.
2. Input output devices: Input devices(keyboard, point and draw devices, data scanning devices, digitizer, electronic card reader, voice recognition devices, vision- input devices),output devices(monitors, pointers, plotters, screen image projector, voice response systems).
3. Processor andmemory: The CentralProcessing Unit (CPU), main memory.
4. Storage Devices: Sequential and direct access devices, magnetic tape, magnetic disk, optical disk, mass to rage devices.
5. Introduction of windows: History, features, desktop, taskbar, icons on the desktop, operation with folder, creating shortcuts, operation with windows (opening, closing, moving, resizing ,minimizing and maximizing, etc.).
6. Introduction to MS-Word: introduction, components of a word window, creating, opening and inserting files, editing document file, page setting and formatting the text, saving the document, spell checking, printing the document file, creating and editing of table, mail merge.
7. Introduction to Excel: introduction, about worksheet, entering information, saving work books and formatting, printing the worksheet, creating graphs.
8. Introduction to power-point: introduction, creating and manipulating presentation, views, formatting and enhancing text, slide with graphs.
9. Introduction of Operating System: introduction, operating system concepts, types of operating system.
10. Computer networks: introduction, types of network (LAN, MAN, WAN, Internet, Intranet), network topologies (star, ring, bus, mesh, tree, hybrid), components of network.
11. Internet and its Applications: definition, brief history, basic services (E- Mail, File Transfer Protocol, telnet, the World Wide Web (WWW)), www browsers, use of the internet.
12. Application ofComputers in clinical settings.

Practical on fundamentals of computers:

Learning to use MS office: MS word, MS Power Point, MS Excel. To install different software

SEMESTER – III

1. Histopathology – Theory(UE)

UNIT I : Introduction – Receipt and despatch of biopsy material DocumentationUNIT II :

Fixation Grossing, Tissue processing

a) (Dehydration, clearing, impregnation, embedding)

b) (Decalcification)

UNIT III : Microtomy

- Knives & Knife sharpening
- Tissue sectioning, mounting etc.UNIT

IV : Principles of staining

Staining techniques – Routine & special

UNIT V : Filling, indexing & preservation of blocks etc.

Frozen section (Cryostat)Museum

techniques

Histopathology (Practical)

Note: Exercises / Spotters to be chosen by the examiners

EXERCISE: (3X10=30 marks)

- Tissue sectioning and H & E staining (1x10=10 marks)
- Special staining: (Any one of the following) (1x10=10 marks)
  - Perls stain
  - PAS stain
  - Giemsa stain
  - Ziehl – Neelsen stain
  - Reticulin stain
  - van Gieson stain
- Any one of the following: (1x10=10 marks)
  - Embedding

- Frozen sectioning

SPOTTERS: (5x2=10 marks) (Any five of the following)

- Lab materials – Name & application of each:

- Tissue cassette
- Paraffin wax
- Disposable blade for microtome
- DPX
- Waterbath
- Diamond pencil
- Cover slip

- Mention two applications of each:
  - Formalin
  - Chloroform
  - Alcohol
  - Xylene
- Charts / photographs:
  - Histokinette
  - Microtome
  - Cryostat
  - Embedding station

2. Cytology – Theory Schedule

1) Introduction to FNAC & Exfoliative cytology
2) **Fixation of smears**
3) Coating fixatives
   a. Polyethylene glycol solution
   b. Diaphane solution
4) Rehydration of air dried smears
5) **Mailing of unstained smears**
6) Preservation of fluid specimens prior to processing – Fresh material
   a. Specimens with a high mucous content
   b. Specimens with a high protein content

c. Specimens with a low mucous or protein content

d. Specimens with low PH

7) Pre fixation of material

a. Ethyl alcohol (50% solution)

b. Sacromannos fixative

c. Mucolex

8) Preparation of fluid smears for microscopic examination

- Direct or sediment smears on glass slides (fresh / clotted / bloody / prefixed)

UNIT II:

1) Processing of fluids

a. Sputum, bronchial aspirates, bronchial washings, gastric washings

b. Urine & other watery fluids

c. Cerebrospinal fluid

UNIT III:

1) Cytocentrifuge preparations

a. Shandon's cytospin

b. Unloading the machine

c. Operation

d. Comments

2) Preparation with membrane filters

a. Materials needed

b. Specimen requirements

c. Method of filtration

3) Preparation of cell blocks

a. Fixed sediment method

b. Bacterial agar method

c. Plasma thrombin clot method

UNIT IV:

1) Preparations of stains and solutions used in the Papanicolau method

a. Graded alcohols

b. Bluing solutions

c. Preparation of Harris, Mayer, Lillie Mayer and Gill Haematoxylins

d. EA50, EA36, EA65 and Orange G

2) Stains for hematologic material and air dried smears

a. Wright stain

b. Giemsa stain

c. Wright Giemsa stain

d. Modified May GrunwaldGiemsa stain

UNIT V:

1) Important factors influencing staining results

a. Maintenance of solutions and stains

b. Dipping slides

c. Intensity of staining reaction

d. Contamination control

e. Important factors influencing the staining results of filters

f. Destaining slides

g. Timing

h. Dye solubility and impurities

i. Total dye content

j. Stains with special purpose depending on category, use stain and fixative

2) Mounting the cell sample

a. Mounting medium

b. Dissolving nuclear pore filters prior to staining

c. Dissolving nuclear pore filters after staining

d. Cover slips

e. Cover slipping the entire sample

f. Method of cover slipping glass slides and filters

g. Cooling slides

3) Stains used in hormonal evaluation

4) Stains used in the identification of sex chromatin

Cytology –Practical

Note: Exercises / Spotters to be chosen by the examiners

EXERCISE: (3x10=30 marks)

- Pap staining (1x10=15 marks)
- Any one the following: (1x10=15 marks)
  - Centrifuging fluid, making smear out of it and staining it with MGG (or)Leishman (or)Wright-Giemsa stain
  - Preparation of cytotek smear and staining it with MGG (or) Leishman(or) Wright-Giemsa stain

SPOTTERS: (5X2=10 marks)

- Lab materials – Name & application of each:
- (Any two of the following) (2x2=4 marks)
  - Cytotek cassette
  - Pasteur pipette
  - Koplin jar
  - Diamond pencil
  - Mention two applications of the following: (Any one) (1x2=2 marks)
  - 95% ethanol
  - Absolute methanol
  - Xylene
- Charts: (Any two of the following) (2x2=4 marks)
  - Pap smear – normal
  - Pap smear – malignancy

REFERENCE

Diagnostic Cytology and its Histopathologic Bases by "Leopald G Koss", Thir

Basic Principles Of Hospital Management

(Common to all specialties – Anesthesia Technology, Cardiac Technology, Clinical Laboratory Technology, Renal Dialysis Technology, Radiology & Imaging Science Technology and PerfusionTechnology)

UNIT I: Introduction to management & Organization

The evolution of Management, Definition and importance of Management. Planning – Organizing – staffing – Motivating – Leading – Controlling. Management of health care units (in brief). Individualbehaviour in organization; organizational functioning (Group / Individual); Perception; Motivation MBO; Organizational Development.

UNIT II: Planning and Management of Hospitals & Clinical Services:

Building and physical layout – space required for separate function – Planning of infrastructure facilities, clinical services, equipment & Human resources – Types of Hospitals. Organization and administration of various clinical services; outpatient services. In-patient services, emergency services, operation theatres, ICU's and super specialty services.

Unit III: Organizing of support clinical services & Hospital management:

Imaging – CSSD – Laboratory – Blood Bank – diet – Medical Records – Mortuary. Housekeeping – Maintenance (Water, Electricity, Civil, Air Conditioning, Lift) – Pest Control – transport – Security. Forecasting – Purchasing & procurement (Sourcing, methods and procedures). – Storing & Issuing, Concept of inventory control, Maintenance of equipments and contracts (with special reference to major biomedical equipments). Trends in financing of Health and Hospital Services – Classification of Hospitals depending on source of financing – roles of financial institutions.

Unit IV: Personnel and quality Management in Hospital & Marketing:

Concepts – Manpower planning – Training & Developments – Team Building – ConflictManagement – Performance appraisal – Office rules and regulations Outline of Strategic Planning andMarketing. Concepts of quality – Professional Audit System – QA program – Medical Audit – Quality Circle – TQM – Patient Satisfaction – ISO 9000. A brief outline – computerization in hospital departments. Concept, Techniques, Indicators, Evaluation of Efficiency & Effectiveness evaluation of hospital and medical care services.

Unit V: Ethical, current issues and Legal Aspects of Hospitals management services:

Laws related to Hospital – Medico Legal Cases law of Torts – Autopsy – Dying declaration – CPA. –Waste Management – Telemedicine – Organ Transplantation – Rehabilitation Service – Health Insurance. Operations Research and Quantitative Methods in Hospital Administration & Nursing Services in a Hospital.

PSYCHOLOGY

UNIT 1: Basic Concepts of Psychology

Definition of Psychology, Origin of Psychology - Philosophical roots of psychology, Schools of Psychology –Structuralism – Gestalt – Functionalism – Behaviorism - Psychoanalysis – Humanistic. Fields of Psychology - Work of a psychologist – Applications of psychology.

UNIT 2: Learning principles and methods

Definition of learning, Factors In The Process of Learning Classical conditioning - Operant Conditioning – The principle of reinforcement and Punishment. Theory of learning. Cognitive learning- Latent learning, Insight learning, and Imitation.

UNIT 3: Motivation, Emotion, Memory and forgetting

Motivation - Definition of motivation – Theories of motivation - Physiological basis of motivation – Motivational factors in aggression – Self-actualization motivation. Emotion – Emotional expression – Theories of emotions. Kinds of remembering – Retrieval processes – The nature of forgetting – Two process theories of memory – Improving memory –Language and thought – Symbols and concepts – Structure – Forms of thought - Thinking and reasoning – Concept formation.

UNIT 4: Development, Sensory Processes and Perception.

Erikson's stages of psychosocial development Lawrence Kohlberg's stages of moral development Freud's Stages of Psychosexual Development Physiological basis of behavior – The brain and nervous system – The sensory process , Some general characteristic of senses – Five senses, Perception: Organization – The role of learning in perception – Perception and attention –Perceptual process.

UNIT 5: Intelligence & Personality

Theories of intelligence – Measuring Intelligence – Kinds of intelligence tests – Ability – Formation of aptitude and attitude – Aptitude tests –Creativity and its tests. Personality – Definition of Personality – Theories of Personality – Assessment of Personality. Social Factors Influencing Personality.

UNIT 6: Social Psychology

Definition, Nature, Subject Matter and Scope Of Social Psychology-Applications and Importance of Social Psychology, Groups: Definition and Type- Primary And

Secondary Groups Social Interaction, Social and Inter-Personal Relations. Inter- personal attraction – Love and Companionship. Prosocial-behavior. Modes of empathy: self – other differentiation and development of empathy. Social influence: attitude and conformity. Definition - Characteristics and Classification of Crowd. Leadership: Definition and characteristics, Defense Mechanisms, frustration and conflict, sources of frustration and conflict, types of conflicts. Aggression and Types of aggression.

UNIT 6: Health Psychology

Definition of Health Psychology -Relating Health Psychology to other fields Clinical Health Psychology, Public Health Psychology, Community Health Psychology, Critical Health Psychology
Abnormal Psychology: Concepts of normality and abnormality, causation of mental illness, neuroses, psychoses, psychosomatic disorders, measures to promote mental health.
Stress - Definitions- Models of Stress – Theories of Stress - Stress reactions – Coping and Stress Management techniques, Pain and its management - Psychological reactions of a patient to loss –
Stages of Acceptance by Kubler-Ross.

REFERENCES:

1. Clifford T. Morgan, Richard a. King, John R. Weis and John Schopler, "Introduction to Psychology" – 7th Edition. Tata McGraw Hill Book Co. New Delhi, 1993.
2. Baron, R. A., & Byrne, D (2006), "Social psychology", New Delhi: Prentice hall of India private limited.
3. Elliot Aronson, Timothy D. Wilson, Robin M. Akert, Samuel R. Sommers, "Social psychology" 9th edition published by Pearson education, Inc.,2006
4. Shelley E. Taylor. "Health Psychology" Third Edition. McGraw Hill International Editions,1995.
5. Swaminathan, V.D, Latha Sathish, "Psychology for Effective Living", Department ofPsychology, University of Madras.
6. Coleman, James. 1980. "Abnormal Psychology and modern life". New Delhi: Tata McGrawHill Ltd.

SEMESTER – IV

1. CLINICAL PATHOLOGY (HEMATOLOGY & URINE ANALYSIS – THEORY (UE)

UNIT I:

1) Components of blood and their functions
2) Haematopoietic system of the body
3) Specimen collection for haemotological studies
4) Discarding procedures
5) Cleaning of laboratory glassware in hematology
6) Determination of Hb concentration
7) Calculation of blood cell indices – MCA, MCH & MCHC
8) Estimation of erythrocyte sedimentation rate
9) Estimation of packed cell volume

UNIT II:

1) Peripheral smear examination-staining, interpretation, normal & abnormal cells,parasites
2) Reticulocyte count
3) Counting on hemocytometer
4) Automated systems in hematology

UNIT III:

1) Approach to the diagnosis of anemia
    a. Screening for sickle cell anemia
    b. Estimation of fetal Hb
    c. Hemoglobin electrophoresis
    d. Osmotic fragility test
    e. Heinz body preparation
2) Lupus erythematosus (LE) cell preparation
3) Approach to the diagnosis of leukemias
    - Cytochemical tests and other investigations
4) Preparation of bone marrow smears for microscopic examinationUNIT IV:
1) Haemostasis
2) Mechanism of blood coagulation
3) Fibrinolysis
4) Bleeding time determination
5) Whole blood clotting time
6) Thrombin time
7) Clot retraction and lysis time
8) Preparation of blood samples for coagulation test
9) PT, PTT, APTT, Plasmarecalcification time, thrombin time
10) Lab diagnosis of bleeding disorders

UNIT V:

- Urine analysis with manual & strip methods
- CSF analysis
- Analysis of serous fluids, synovial fluids, gastric juice
- Semen analysis

2. CLINICAL PATHOLOGY (HEMATOLOGY & URINE ANALYSIS – PRACTICAL

Note: Exercises / Spotters to be chosen by the examiners

EXERCISE: (3x10=30 marks)

- **Smearing peripheral blood, staining with Leishman stain and differentialcounting (1x10=10 marks)**
- **Any one of the following: (1x10=10 marks)**
  - Urine physical & chemical examination for the presence of reducing sugar,protein, blood,ketone – manual method
  - Urine physical & chemical examination for the presence of reducing sugar,protein, blood,ketone – strip method
- **Any one of the following: (1x10=10 marks)**
  - Hb estimation by colorimeter
  - Estimation of ESR
  - Total count on hemocytometer
  - Staining of reticulocytes
  - Semiautomated PT
  - Semiautomated aPTT
  - Urine microscopic examination
  - Fluid – Physical examination, Total count
  - Fluid – differential count on a stained smear
  -
  - **SPOTTERS: (5X2=10 marks) (Any five of the following)**

- Lab materials – Name & application of each:
  - Vacutainer – Lavender / Blue / Green / Grey topped
  - ESR tube
  - Cuvette
  - PCV tube

- Pasteur pipette
- Micropipette
- RBC pipette
- WBC pipette
- Neubauer chamber
- Bone marrow needle
- Lancet

• Slide identification:

- Malaria
- Iron deficiency anemia

• Charts:

- Microfilaria
- Reticulocyte
- Sickle cell
- Chronic myeloid leukemia

EXAM PATTERN:

Exercise = 30 marks

Spotters / Charts = 10

marksViva = 20 marks

REFERENCE

"Medical Laboratory Technology: Methods and Interpretations" by R. Sood, 6th edition

BLOOD BANKING AND IMMUNOLOGY – THEORY (IE)

UNIT I – Immunology

- Introduction to immunology
- Cells of Immune System
- Complement pathway
- Cytokines
- Hypersensitivity reactions
- HLAand Tissue typing
- Blood group genetics
- Elisa, Western blot

UNIT II-Introduction to immunohematology-

- Introduction to immunohematology
- Characteristics of antigens – antibodies
- Factors influencing antigen – antibody reactions
- Principles of antibody potentiators
- Direct antiglobulin test
- Indirect antiglobulin test
- Sources of error in antiglobulin test
- Blood banking reagents
- Rroutine testing procedures in immunohematology laboratory
- ABO blood group system
- Rh blood group system
- Other blood groups

UNIT III- Blood Banking Technology

- Blood donor selection
- Blood donor reactions

- Blood collection
- Blood component preparation and storage
- Blood component uses
- Pretransfusion testing
- Blood administration
- Adverse reactions of blood transfusion

UNIT IV-Transfusion Transmitted Diseases and safety precautions

- Transfusion transmitted diseases
- HIV, HBsAg, HCV, Syphilis and Malaria
- Testing for TTI
- Universal precausions

UNIT V- Quality Assurance and Regulation of Blood Bank Industry

- Blood bank licensing issues
- Good manufacturing practices
- Blood bank safety programs
- Sickle cell
- Chronic myeloid leukemia
- LE cell

EXAM PATTERN: (UE) Total marks – 60Exercise = 30

marks

Spotters / Charts = 10

marksViva = 20 marks

REFERENCE

"Medical Laboratory Technology: Methods and Interpretations" by R. Sood, 6th edition

2. BLOOD BANKING & IMMUNOLOGY PRACTICALS

Note: Exercises / Spotters to be chosen by the examiners

Exercise: Any three of the following: (10x3= 30 marks)

1. Blood grouping & Rh typing
2. Cross matching
3. Direct Coombs test
4. Indirect Coombs test
5. TTI rapid tests
6. Antisera affinity & avidity

Spotters: Any five of the following: (2x5 = 10 marks) (1 mark for identificationand 1 mark formentioning the use)

1. Antisera
2. Gel cards
3. Pasteur pipette
4. Elisa plates
5. Antiglobulin reagents
6. TTI rapid test rate
7. Blood bags – single, double, triple
8. Fresh frozen plasma
9. Platelet concentrate
10. Leukodepletion filters

Viva = 20 marks

EXAM PATTERN: (UE) Total marks – 60

Exercise – 30 marks Spotters – 10 marks Viva –20 marks

HEALTH CARE MANAGEMENT

UNIT I: Concept of Health Care and Health Policy

Health in Medical Care, Indigenous systems of Health Care & their relevance, Framework for HealthPolicy Development.

UNIT II: Health Organisation

Historical development of Health Care System in the third world & India, Organization & Structure of Health administration in India, Type of Health Organization including International Organizations, Private & Voluntary Health care provider, Distribution of Health Care Services, Health Care System in Public sector Organization, Health systems ofVarious Countries.

UNIT III: Health Policy and National Health Programme

National Health Policy, Drug Policy, National Health Programs (Malaria, T.B., Blindness, AIDS etc.,) Evaluation of Health Programs (Developing indicators for evaluation), Medical Education & HealthManpower Development.

UNIT IV: Health Economics – Fundamentals of Economics

Scope & Coverage, Demand for Health Services, Health as an Investment, Population, health of Economic Development. Economics of Health-

Population based health services, Economics of Communicable and Non Communicablediseases

UNIT V: Methods & Techniques of Economic Evaluation of Health ProgramCost

Benefit & Cost Effective Methods

- Household & Health

  Health Expenditure & Outcome, Rationale for Government action, Householdcapacity, incomeand schooling

- Health Insurance.

MEDICAL SOCIOLOGY

UNIT 1: NATURE AND SCOPE OF SOCIOLOGY

Definition, Historical background, subject
matter of sociology, Nature and scope,
Importance,Sociology of India, Relationship of sociology with other social sciences

UNIT 2: FUNDAMENTAL CONCEPTS OF SOCIOLOGY

Society and Individual, Community, Social structure and functions of Institutions, Association, Organization, Social system, social order, Social control, social groups, Social Process, Social change.

UNIT 3: CLASSICAL THINKERS AND THEIR CONTRIBUTIONS

Auguste comte, Emile Durkheim, KarlMarx, Max Weber, Herbert Spencer

UNIT 4: SOCIOLOGY OF INDIA

Characteristics of Indian society, Racial linguistic, Religious and demographic, Hindu social organization-ashramas, varnas, dharma and karma, purushartha, Caste system, Problems of SC&ST, Sanskritisation, Westernization and Modernization.

UNIT 5: ANTHROPOLOGY AND CULTURAL ANTHROPOLOGY

Definition of anthropology, Subfield of anthropology, Cultural Anthropology yesterday and today,Anthropological Perspectives, Early Anthropologist
33Environment and culture, Kinship, Clan Ethno methodology, Gender, Subsistence and Exchange, Social Organization and evolution of political system.

Reference:

- Bottomore.T.B., Sociology: A guide to problems and Literature,1971,Random House
- Gisbert P. Fundamentals of sociology,3rd Edition,2004,Orient Longman publications
- Neil J.Smelser,Handbook of sociology,1988.sage publication
- Johnson R.M,Systematic Introduction to Sociology,1960,Allied Publishers
- Cultural Anthropology,Barbara D.Miller,2006 Pearson/Allyn and Bacon Co
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1. GENERAL BACTERIOLOGY, IMMUNOLOGY AND SYSTEMATIC BACTERIOLOGY

Course Objective

This course will cover the following areas.

1. Basic principles of General Bacteriology and Immunology.
2. Fundamental knowledge about bacterial, viral, parasitic and fungal infections.
3. Techniques involved in diagnostic microbiology – preparation of media, sterilization and disinfections procedures, specimen collection, processing of clinical specimen, serological procedures etc.

UNIT 1 : General bacteriology

- Morphological classification of bacteria
- Bacterial cell structure – cell wall, cytoplasmic membrance, cytoplasm, flagella, fimbriae, nucleic acids, capsule, spore (diagram of bacterial cell structure)
- Definition of sterilization and disinfection, classification of physical and chemical methods of sterilization, autoclave, hot air oven filtration, chemical agents of sterilization – alcohol, aldehydes, halogens, phenol, gaseous method of sterilization, surface active agents, quality controls for sterilization procedures

UNIT 2: Culture media & methods

- Culture Media – Types – simple media, enriched media, enrichment media, selective media, indicator media, sugar media, transport media, anaerobic media (suitable examples)
- Culture methods – Aerobic culture method – streak culture, lawn culture, stroke culture, stab culture, inoculation in liquid culture, anaerobic culture media and methods Robertson's cooked meat media, thioglycollate medium, anaerobic jar
- Identification of bacteria – staining techniques – grams staining, acid fast staining. Biochemical reactions – sugar fermentation and IMViC tests. Antibiotic susceptibility testing – Kirby Bauer disc diffusion test

UNIT 3: Immunology

- Sources and spread of infections
- Immunity – definition types of immunity with examples, vaccines, antibodies – typesand functions
- Antigen antibody reactions – precipitation, agglutination, ELISA,immunochromatography.
- Hypersensitivity – definition, types, anaphylaxis

UNIT 4: Systemic Bacteriology

- Stahphylococcs, Streptococcus, - morphology,culture characteristics, Laboratorydiagnosis
- Niessena – Gonococcus and meningococcus – morphology, culture characteristics
- Gram negative bacilli – Escherichia coli, Klebsiella species, Proteus species, Pseudomonas species, Salmonella species, Shigella species, Vibrio species, Acinetobacter species– Morphology, cultural characteristics, laboratory diagnosis

UNIT 5 :

- Mycobacterium tuberculosis – morphology, culture characteristics & Laboratory diagnosis
- Hospital acquired infections – definition, types, source and mode of spreadofinfection, hospitalinfection control
- Biomedical waste management – definition, segregation, managementUniversal precautions
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GENERAL BACTERIOLOGY, IMMUNOLOGY ANDSYSTEMATIC BACTERIOLOGY

UNIT 1: General Bacteriology

- Microscope – Structure, operation, maintenance, types.
- Staining techniques – simple staining, Gram staining, Acid fast stainingDetection of
- motility by hanging drop.

- Sterilization – Autoclave – Principle, working,

maintenanceHot air oven – Principle, working, maintenance

Chemical disinfectants – sodium hypochlorite, Iysoformin, phenols, gluteraldehyde, chlorhexidine/betadine (Povidine iodine)-uses

UNIT 2: Culture Media & Culture methods

- Culture Media – Types – simple media, enriched media, enrichment media, selective media, indicator media, sugar media, transport media, anaerobic media – Preparation, sterilization and uses
- Culture methods – Aerobic and anaerobic culture methods – Techniques
- Identification of bacteria – biochemical reactions preparation and inoculation and interpretation
- Antibiotic susceptibility testing – Kirby Bauer disc diffusion testUNIT 3:

Immunology

- Serological tests – agglutination tests – Latex agglutination, tube agglutination
- Immunochromatography – Rapid card tests.
- ELISA (Enzyme linked immunosorbent assay)
- Mantoux test – Administration (type IV hypersensitivity)UNIT 4:

Systemic Bacteriology

- Staphylococcus, Streptococcus – Microscopy, colony morphology, identification
- Neisseria – Gonococcus and meningococcus – Microscopy
- Gram negative bacilli – Escherichia coli, Klebsiella species, Proteus species, Pseudomonas species, Salmonella species, Shigella species, Vibrio species – Microscopy, cologymorphology, Identification
- Mycobacterium tuberculosis – Microscopy, colony morphology, identification

UNIT 5: Applied Microbiology

- Hospital acquired infections – definition, types, source and mode of spreadof infection,hospital infection control – charts
- Biomedical waste management – spotter & charts
- Universal precautions – spotters & charts Drinking
- water analysis / Milk analysis
- Allergen testing

Exam pattern (UE) Total marks – 60

1. Spotters & Charts – 10 (10x2=20)
2. Staining and culture techniques – 20
3. Serological techniques – 10
4. VIVA– 10

3. VIROLOGY, MYCOLOGY AND PARASITOLOGY – THEORY (UE)

UNIT 1 : General virology

- General properties of viruses – Basis structure of the virus, classification ofvaruses, viralmultiplication
- Cultivation of viruses – Animal inoculation, embryonated eggs, tissue cultures
- Laboratory diagnosis of viral infections – Briefly on Microscopy detection ofviral antigensand antibodies, isolation of virus, molecular diagnosis.
- Viral vaccines – Live and killed viral vaccine routinely administered**UNIT 2:**

Medically important viruses I

- Mode of transmission, clinical manifestations, and preventive measures.
  1. Herpes simplex viruses (HSV I & II)
  2. Influenza virus
  3. Polio virus
  4. Measles.

UNIT 3: Medically important viruses II

- Mode of transmission, clinical manifestations, and preventive measures.

1. Dengue
2. Japanese B encephalitis
3. Chikungunya
4. Hepatitis
5. HIV

UNIT 4: Medically important fungi

- Morphology & infections caused by – Candida species, Dermatophytes, Aspergillus species, Mucor & Rhizopus.
- Culture media and staining methods used in identification of fungi **UNIT 5:**

Medically important parasites

- Etiology, mode of transmission, sample to be collected – Ameobiasis, malaria, tape, worms, round worm, hook worm, filarial worm infections, pin worm, strongyliodes & whip worm infections.
- Stool examination, Peripheral blood smear examination

4. VIROLOGY, MYCOLOGY AND PARASITOLOGY – PRACTICAL(UE)

- Sample collection-blood collection, serum separation, collection of otherrequired specimens
- Rapid card tests & ELISA for detection of antigens and antibodies
- Fungal media preparation and inoculation – Sabouraud's Dextrose Agar, Corn mealagar.
- Staining techniques – LPCB mount, KOH mount
- Stool concentration techniques, identification of ova cyst in stool samplesby saline andiodine mount,
- Peripheral blood smear – Preparation, Leishman's staining**Exam**

pattern (UE) Total marks - 60

1. Spotters & Charts – 10 (10x2=20)
2. Staining and culture techniques – 20.

3. Serological techniques – 10

4. VIVA– 10

5. HOSPITAL PRODUCTS, PROMOTION, SALES AND PUBLIC RELATIONS

UNIT I:

- **An introduction to Marketing**

  Role of marketing in Business management – Evolution and definition of marketing – Concepts of Marketing – Service vs. Products – Management of Service Management process

- **Services Marketing**

  Classification of services – Characteristics of services and their marketing implication – Selecting appropriate tools for marketing.

UNIT II:

- **Component of Service Marketing**

  Product Planning, Market research system – Market segmentation – Targeting – Positioning – Launching new service – Concept of product life cycle, Pricing, setting the price – Economic Theory – Responding to price change, Physical Distribution, Major Aspects – Channels of distribution – Selection of channel, Promotion, Role of communication – Promotion mix – Advertising (Media – budget – Cost effectiveness – (attributing to hospitals a human face

  – Good will – image building among major public), Sales promotion (techniques – Evaluation), Direct selling (Sales force – Evaluation), Physical Environment,Process, People Unit III:

UNIT III:

- **Analysing Markets and Buyer Behaviour**

  Model of consumer behavior – Factors influencing buyer behavior – Buyingdecision process.

- **Branding of a Hospital Faculity**

  Brad name and concept - Positioning hospitals – Developing and USP –Brand image – Image building– long term and short term activities.

UNIT IV:

- **Other Marketing routes for Health Care Units**

  Interpersonal communication – Print materials institutional marketing –seminars – conference.

- One case study related to Hospital Marketing

OR

PHYSICIAN'S OFFICE MANAGEMENT

UNIT I. Outpatient Section

Registration of new cases, Registration of repeat cases, Patient record guide, Laboratory X-Rayreports & reports & reports filing, Alpha index typing & Filing, O.P.
Records coding

(Disease & indexing), O.P. records retrieval, O.P. Statistics

UNIT II. Inpatient Section

Admitting office procedure, Inpatient record removal & forwarding, WardCensus,

UNIT III. Assembling & deficiency checks, I.P. record coding & indexing,

UNIT IV. Discharge Analysis

Incomplete record control, Completed record control, Medico legal procedures & issueof Medical Certification, Record retention & destruction of O.P. & I.P. records,

UNIT V. Miscellaneous

Hospital reception, Secretarial practice, Library (Medical)

SEMESTER – VI

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1. CLINICAL CHEMISTRY PAPER – I – TEHEORY (UE)

UNIT I

1. Role of a lab technician in Clinical Biochemistry lab.
2. Lab utensils: Beaker, Funnels, graduated cylinders, flasks, Volumetric flasks, Syringes, Pipettes, Micro pipettes, Multi – channel pipettes, Dilutors & dispensers. Quality control of micropipettes, Quality control validation for performance of pipettes.
3. Lab plastic & glass ware composition and cleaning.
4. Laboratory safety: Guidelines of OSHA, general safety (Fire, Electrical safety), Chemical Hygiene plan, Storage of chemicals, Labelling & Handling requirements, Waste generation &disposal

UNIT II : Units of measurement

Measurement of mass – basic quantities and units of SI. SI derived units used in medicine. Types ofbalances – maintenances of balance.

Basic calculations in Laboratory. Normality, Molality, Molarity, Dilutions – per cent concentration (wt/w, v/v, w/v), pH, pk, buffer preparation.

Water as reagent– Reagent grade water – purification process – Grade of water purity – siorage & handling of reagent water – suggested uses of reagent water – Quality control – system documentation & record keeping

UNIT III : Instrumentation

Centrifuges – principles of centrifugation – centrifuge types, components, maintenance and quality assurance Water bath, Oven, Incubator – thermometer, calibration and maintenance

Photometry – principles of photometry. Components & applications of colorimeter. Spectrophotometer, Flame photometer, Nephlometer try, turbidimetry & reflectance photometry

Enzymes definition, action, and kinetics

UNIT IV

Electrochemistry: Principles and measurements of electrochemistry & electro analytical chemistry. Putenticrnetry, Voltametry coulometry methods – Principles,components, usage, advantages &disorder.

Electrophoresis – Principles, components, procedure, types, clinical application &interpretation ofthe data

UNIT V

1. Chromatography – Principles, components, procedure, types, clinical application
2. Immunochemistry techniques – Principles of immunochemistry, detectors needed sensitivity &specificity – Elisa, Chemiluminscence, fluorescence assays.
3. Semi automatic, Automatic – Overview, Principles and methodologies used.

CLINICAL CHEMISTRY PAPER I – PRACTICAL

UNIT I – Pipetting & Weights and Measurements: Principles of weighing, usageof pipettes,pipetting

Practice – principles of weight – preparation of solutions, Normality – molality –molarity –Dilution – percentage (V/V, W/V, V/W)

UNIT II – pH and Buffers – Preparation of different buffers – measurementsof pH (pHpaper, pH meter)

UNIT III – Standardisation of Biochemical substances – Glucose, Urea, Creatinine

UNIT IV – Estimation of Glucose, Urea, Creatinine, total protein, Albumin

UNITV – Charts / Spotters / Case Studies

1. Lab safety
2. Grading of reagent water
3. Conversion of Units
4. Calculation in Biochemistry
5. Waste generation St Disposal
6. PH
7. Buffer
8. Standardisation curve
9. Serum Protein Electrophoresis
10. Instrumentation – Identification

3. CLINICAL CHEMISTRY PAPER-II-THEORY (UE)

UNIT I: Pre – analytical – Blood Collection – Types of blood sample – Preservatives & anti-coagulants – Errors related to it Vacutainer system procedures to decrease phlebotomy related variables – Patient identification sample collection – Past collection cause – sample transportation – Procedure to minimize sample transportation errors – use of mechanical transporters – sample processing – procedures – Pre analytical variables in urine collections – pre-analytical variables inother body fluids – Blood collection for inborn errors of Metabolism – criteria for rejection of spdecimens

UNIT II: Analytical-

1. Overview of glucose homeostasis, Definition of Diabetes, overview of pathophysiology, Type I, II, GDM, Pre-Diabetes. Methodologies, comparison of methodologies, reference level. Diagnostic guidelines – Glucose, Insulin, C- Peptide, Glucose Tolerance test Determination, usage of HbA1C methodology toestimate.
2. Lipid Profile: Definition of lipid, Over view of types of lipid, distribution, their role in the L6L' – Estimation of Total Cholesterol, triglycerides, HDL Cholesterol, LDL Cholesterol, VLDL Cholesterol – Methodology – Reference level
   – Diagnostic guidelines.
3. Liver Profile – Overview of Liver damage and the tests to identify it – total protein, Albumin, Bilirubin (Total & Direct), ALT, AST, ALP & GGT – Methodology – Reference level.
4. Renal Profile – Overview about Renal function, GFR, tubular function tests.
5. Minerals: Role of minerals in health – estimation of calcium, phosphorus, Magnesium, Iron, copper – Methodology – Reference level – interpretation of data.

   Vitamins: Estimation of Folic acid, Vitamin B12 Vitamin D, Vitamin K, Vitamin B b6-methodology – Reference level – interpretation of data

UNIT III: Special Investigations: Hormones

Thyroid Gland Regulation, Test to Identify Thyroid disorder (T3, T4, FT3, FT4, TSH), Methodology and interpretation, Role of PTH in our Body, Tests to identify parathyroid disorder, PTH (free and Intact) Interpretation, Tests for Infertility LH, FSH, Prolactin, Estradiol, Testosterone (Free & total), B HCG interpretation, Methodologies existing, Hormone analysis

UNIT IV: Other Special Investigations

Tumour markers – Investigation for Myocardial Infraction – Investigation for acute Pancreatitis – Acid base abnormality – Anion Gap Nutritional assessment – Negative Nitrogen Balance – Positive Nitrogen Balance

UNIT V: Quality Control:

Sensitivity – Specificity – Linearity – Accuracy & Precision, Primary Standard, Secondary standard, Calibration – Internal Quality control indicators, External Qualtiy Control Program, test utilization and turn around time, around time, Regulations for Lab (by Indian Govt Internatior: Guideliness). Hospital management structure – organisation of clinical lab, Communication within the total hospital, communication within the lab, Personal Management, Work Scheduling, Continuous Quality improvement – Continuing education – resource management (Lab staff, reagents, supplies& capital equipment).

4. CLINICAL CHEMISTRY PAPER II – PRACTICAL

UNIT I-Estimation of Bilirubin, Cholesterol, Triglycerides, Uric Acid, Calcium,Phosphorus

UNIT II-Estimation of Enzymes amylase, Alkaline Phosphatases, Lipase

Unit III-Electrophoresis – Agar gel Electrophoresis – serum Protein Electrophoresis Identification and interpretation

UNIT IV-Chromatography – Circular paper chromatography – separation ofAmino acids & Sugars and calculation of Rfvalues

UNIT V-Charts/Spotters/Case Studies

- Preservatives
- Anti-coagulants
- Types of Samples
- Vaccutainers
- Blood Collection
- Reference interval
- Glucose Tolerance test graphs

- Interpretation of Routine tests
- QC materials
- Guideline tor regulation of Lab

5. TRAUMA LIFE & CARDIAC LIFE SUPPORT

UNIT I. TRAUMA LIFE (Part 1)

- BLS
- TRIAGE
    a. Primary Survey
    b. Secondary Survey
        - Airway & Ventilatory management
        - Shock
        - Central & peripheral venous access
        - Thoraclc trauma – Tension pneumothorax
        - Other thoracic injuries
        - Abdominal trauma – Blun injuries
        - Abdominal trauma – Penetrating injuriesUNIT

II. TRAUMA LIFE (Part 2)

- Spine and spinal cord trauma
- Head trauma
- Musculoskeletal trauma
- Electrical injuries
- Thermal burns
- Cold injury

UNIT III. TRAUMALIFE (Part 3)

- Paediatric trauma
- Trauma in pregnant women

- Workshop BLS
- Workshop cervical spine immobilization
- Imaging studies in trauma

UNIT IV. CARDIAC LIFE SUPPORT (Part 1)

- BLS
- The universal algorithm for adult ECC
- Ventricular fibrillation/Pulseless ventricular tachycardia algorithm
- Pulseless electrical activity (PEA) / asystole algorithm
- Bradycardia treatment algorithm
- Tachycardia Treatment algorithm

UNIT V. CARDIAC LIFE SUPPORT (Part 2)

- Hypotension / Shock
- Acute myocardial infarction
- Paediatric Advanced life support
- Airway management
- Defibrillation
- Drugs used in ACLS
- SEmergency Cardiac pacing
- AED
- Techniques for oxygenation and ventilation

BIOSTATISTICS AND RESEARCH METHODOLOGY

- **What is statistics** – Importance of statistics in behavioural sciences – Descriptive statistics and inferential statistics – Usefulness of quantification in behavioural sciences.

- **Measurements** – Scales of measurements – Nominal, Ordinal, Interval and Ratio scales.

- **Data collection** – Classification of data – Class intervals – Continuous and discrete measurements – Drawing frequency polygon – types of frequency polygon – Histogram.

- **Cumulative frequency curve** – Ogives– Drawing inference from graph.

- **Measures of central tendency** – Need – types: Mean, Median, Mode – Working out these measures with illustrations.

- **Measures of variability** – Need – Types: Range, Quartile deviation, Average deviation, Standard deviation, Variance – Interpretation.

- **Normal distribution** – General properties of normal distribution – Theory of probability – Illustration of normal distribution – area under the normal probability curve.

- **Variants from the normal distribution** – skewness – Quantitative measurement of skewness – kurtosis – measurement of kurtosis – factors contributing for non-normal distribution.

- **Correlation** – historical contribution – meaning of correlation – types: Product, moment, content correlation, variation of product, movement correlation, rank correlation, Regression analysis.

- **Tests of significance**- need for – significance of the mean – sampling error – significance of differences between means – interpretation of probability levels – small samples – large samples.

VII & VIII SEMESTER

1. **Project & Dissertation**
2. **Postings During Internship**

- **BLOOD COLLECTION AREA**
- **BIOCHEMISTRY LAB**
- **MICROBIOLOGY LAB**
- **HISTOPATHOLOGY LAB**
- **CYTOLOGY LAB**
- **BLOOD BANKING**
- **PATHOLOGY SPECIMENS SECTION AREA**