

## B.Sc. Medical Lab Technology (BSCMLT)

### SEMESTER I

#### **BSCMLT-101: Microbiology**

##### GENERAL MICROBIOLOGY

Introduction and Brief History of microbiology: Definition, History and relationship of micro-org. to man Safety measures in microbiology

Care and maintenance of laboratory equipment[3]

Culture media :

(a) Preparation of various media (b) Standardization and use

Sterilization :

(a) Definition (b) Different methods and principles –Moist heat ,dry heat,Radiation &filtration

(C) Autoclave - its structure ,functioning , control & indicators

Antiseptics and disinfectants ; Definition , types ,mode of action & propertiesUses of disinfectant & antiseptics ,testing efficiency

Glassware : Description of glass ware ,its use ,handling and care,Decontamination and disposal of contaminated material

General characteristics and classification of important bacteria and fungi

##### VIROLOGY

Introduction to virology

Physiochemical characteristics of viruses

Diseases caused by different viruses and mode of infection

##### PARASITOLOGY

Introduction to medical parasitology and safety measures

General characters and classification of protozoa of Medical Importance

Morphology, Life cycle and laboratory diagnosis of Intestinal Protozoa- Amoebae and Giardia

### SEMESTER I

#### **BSCMLT-102: Anatomy & Histotechnology**

##### **Introduction to Histopathology and laboratory organization**

Laboratory equipment ,its uses and maintenance

Laboratory hazards and safety precautions

Anatomy and physiology of human body: General organization , synopsis of all systems

Cell organization and function : Structure & function of all cell organelles

Skeletal system : Structure and function of all individual bones and joints ,movement of joints ,Skeletal muscles , Cardiac muscles ,smooth muscles , muscles of upper arm & anterior compartment of thigh (their name, attachments , functions and nerve supply)

Blood : Functions of blood , composition of blood ,plasma & its functions ; Blood clotting (mechanism ,clotting factors )

; Morphology of red blood cells , their function and development ,Haemoglobin ,anaemia ; WBC :classification

development & functions ; platelets : morphology &functions ; Blood groups , blood transfusion and transfusion reactions

Respiratory system : Structure of respiratory pathway ,function of respiratory tract ,cough reflex ,intrapleural pressure, mechanism of breathing and respiration , muscles of respiration ,vital capacity , tidal volume ,inspiration ,reserve volume and residual volume I.

Reception, recording and labeling of histology specimens  
Fixation and various fixatives  
Processing of histological tissues for paraffin embedding  
Embedding and embedding media  
Decalcification -various methods  
Introduction to exfoliative cytology with special emphasis on female genital tract(PAP smear, cone biopsy)  
Solvents, mordents, accelerators and accentuators

### **BSCMLT-103: Haematology and Clinical Pathology**

Introduction to hematology : Definition , importance , important equipment and chemicals, various tests performed, laboratory organization  
Composition and function of blood : Definition of blood , composition of blood (cells, plasma /serum )  
Formation of blood : Erythropoiesis ,Leucopoiesis , Thrombopoiesis  
Anticoagulants :Definition , uses, different types , mode of action, their merits and demerits  
Morphology of normal blood cells : Normal morphology , morphology in diseases  
Collection and preservation of blood :Different methods of collection , preservation ,changes in stored blood  
Normal and absolute values in hematology: RBC count , WBC count ,Platelet count ,DLC value , Hb , MCH ,MCV ,MCHC , ESR, PCV  
Blood film : Different types , Methods of preparation ,Staining  
Romanowsky stains : Principle of staining , Different stains ,their composition and preparation , method of staining

### **SEMESTER I**

#### **BSCMLT-104: Biochemistry**

Introduction to medical lab technology : General introduction Role of medical lab technologists, ethics, responsibility, safety measures and first aid. Cleaning and care of general laboratory glassware and equipment.  
Distilled water :Types of distilled water plants , preparation & storage  
Analytical balance: Principal ,Working & maintenance ; Preparation of reagents : Formulation and preparation ;  
Standard solutions: Various std. solutions used , their preparation ; storage of chemicals .  
Units of measurements: S.I units: Definitions, conversions; Measurement of volume : Strength , Normality ,  
Molarity, Molality: volumetric apparatus, calibration of volumetric apparatus  
Definitions : Mole, molar and normal solutions (preparation , Standardization ) ; pH ( Definition ,Pka value, Example ,  
Derivation of Henderson-Hasselbalch equation) ; Buffer solutions( Definition , preparation of important solutions), pH indicators ( pH papers , universal & other indicators ) ;pH measurement :different methods (pH paper , pH meter , principle of pH meter , structure ,working and maintenance.

## **SEMESTER I**

### **BSCMLT-105: Introductory Biology**

#### **Unit I**

##### **Living World**

Biology & Its Branches; relationships with other sciences; scientific methods in Biology; historical breakthroughs; scope of biology and career options; role of Biology in dispelling myths and misbeliefs; characters of living organisms, (elementary idea of metabolism, transfer of energy at molecular level, open and closed systems, homeostasis, growth and reproduction, adaptation, survival, death).

Origin and evolution of life - theories of evolution; evidence of evolution; sources of variations

(mutation, recombination, genetic drift, migration, natural selection); concept of species; speciation and isolation (geographical and reproductive); origin of species.

#### **Unit II**

##### **Diversity of Life**

Variety of living organisms, Systematics; need, history and types of classification (artificial, natural, polygenetic); biosystematics; binomial nomenclature; Two kingdom system, Five

kingdom System, their merits and demerits, status of bacteria and virus; botanical gardens and herbaria; zoological parks and museums.

#### **Unit III**

##### **Cell and Cell Division**

Cell as a basic unit of life - discovery of cell, cell theory, cell as a self-contained unit; prokaryotic and eukaryotic cell; unicellular and multicellular organisms; tools and techniques (compound microscope, electron microscope and cell fractionation); Ultrastructure of prokaryotic and eukaryotic cell - cell wall, cell membrane - unit membrane concept (fluid mosaic model); membrane transport; cellular movement (exocytosis, endocytosis); cell organelles and their functions

- nucleus, mitochondria, plastids, endoplasmic reticulum, Golgi complex, lysosomes, lysosomes, microtubules, centriole, vacuole, cytoskeleton, cilia and flagella, ribosomes.

Molecules of cell; inorganic and organic materials - water, salt, mineral ions, carbohydrates, lipids, amino acids, proteins, nucleotides, nucleic acids (DNA and RNA);

Enzymes (Properties, chemical nature and mechanism of action); vitamins, hormones and steroids.

#### **Unit IV**

##### **Genetics**

Continuity of life - heredity, variation; Mendel's laws of inheritance, chromosomal basis of inheritance; other patterns of inheritance - incomplete dominance, multiple allelism, quantitative inheritance.

Chromosomes - bacterial cell and eukaryotic cell; parallelism between genes and chromosomes; genome, linkage and crossing over; gene mapping; recombination; sex chromosomes; sex determination; sex linked inheritance; mutation and chromosomal aberrations; Human genetics - methods of study, genetic disorders.

DNA as a genetic material - its structure and replication; structure of RNA and its role in protein synthesis; Gene expression - transcription and translation in prokaryotes and eukaryotes; regulation of gene expression, induction and repression - housekeeping genes; nuclear basis of differentiation and development; oncogenes.

Basics of Recombinant DNA technology; cloning; gene bank; DNA fingerprinting; genomics - principles and applications, transgenic plants, animals and microbes.

## Unit V

### Morphology of Plants and Animals

Morphology - root, stem and leaf, their structure and modification; Inflorescence, flower, fruit, seed and their types; Description of Poaceae, Liliaceae, Fabaceae, Solanaceae, Brassicaceae and Asteraceae.

Morphology of animals - salient features of earthworm, cockroach and rat; tissue systems, structure and function of tissues - epithelial, connective, muscular and nervous.

### Practical

1. Study of parts of Compound Microscope
2. Study of mitosis in onion root tip and animal cell (grasshopper)
3. Study of meiosis in onion flower buds, and testis of grasshopper.
4. Study of cyclosis in leaf cell of Hydrilla, or Tradescantia and in Paramecium.
5. Study of cell wall components ( cellulose, lignin, suberin and mucilage).
6. Study of mitochondria by staining with a Janus Green.
  
7. Study of specimens and their identification with reason - Bacteria, Oscillator, Spirogyra, Rhizopus, mushroom/bracket fungi, yeast, liverwort, moss, fern, Pinus, one monocotyledon, one dicotyledon and lichens.
8. Study of characters of specimens and identification with reason - Amoeba, Hydra, Liver - Fluke, Ascaris, Leech, Earthworm, Prawn, Silk moth honey bee, snail, Starfish, Dogfish, Rohu, Frog, Lizards, Pigeon/ any other bird and rabbit/ any other mammal.
9. Study of squamous epithelium, muscle fibres, nerve cells and mammalian blood film through temporary/permanent slides.
10. Study of external morphology of earthworm, cockroach, frog and rat through models.

## SEMESTER I

### BSCMLT-106: Communication & Soft Skills

#### UNIT I

##### Essentials of Grammar:

- Parts of Speech
- Punctuation
- Vocabulary Building
- Phonetics

#### UNIT II

##### Office Management:

- Types of Correspondence
- Receipt and Dispatch of Mail
- Filing Systems
- Classification of Mail.
- Role & Function of Correspondence
- MIS
- Managing Computer

#### UNIT III

##### Letter & Resume Writing:

- Types of Letters-Formal / Informal
- Importance and Function
- Drafting the Applications
- Elements of Structure

- Preparing the Resume
- Do's & Don'ts of Resume
- Helpful Hints

#### **UNIT IV**

##### **Presentation Skills:**

- Importance of Presentation Skills
- Capturing Data
- Voice & Picture Integration
- Guidelines to make Presentation Interesting
- Body Language
- Voice Modulation
- Audience Awareness
- Presentation Plan

- Visual Aids
- Forms of Layout
- Styles of Presentation.

#### **UNIT V**

##### **Interview Preparation:**

- Types of Interview
- Preparing for the Interviews
- Attending the Interview
- Interview Process
- Employers Expectations
- General Etiquette
- Dressing Sense
- Postures & Gestures

#### **UNIT VI**

##### **Group Discussion & Presentation:**

- Definition
- Process
- Guidelines
- Helpful Expressions
- Evaluation

(Note: Every student shall be given 15 minutes. of presentation time & 45 minutes of discussion on his/ her presentation.)

**The student will be evaluated on the basis of :**

- his / her presentation style
- Feedback of Faculty & Students
- General Etiquette
- Proficiency in Letter Drafting / Interview Preparation

The paper is internal and at least 3 tests will be taken. Best 2 of 3 shall account for final grades (70% Test & 30% Presentation)

#### **SEMESTER I**

##### **BSCMLT-107: Practical**

Microbiology - 15 Marks

Anatomy & Histotechnology - 15 Marks

Haematology & Clinical Pathology - 15 Marks  
Biochemistry - 15 Marks  
Introductory Biology - 15 Marks  
Internal Assessment: 25 Marks

## SEMESTER II

### **BSCMLT-201: Microbiology**

#### **I GENERAL MICROBIOLOGY**

Principle of staining methods and preparation of reagents

Aerobic and anaerobic culture methods

General characters and nature of antigen and antibody

Principle of antigen antibody reaction

Collection, transportation and processing of clinical samples for microbiological investigations

Principle and mode of action of antibiotics and chemotherapeutic agents for bacteria and fungi

Care and handling of laboratory animals

Laboratory organisation, management, recording of results and quality control in microbiology

#### **II VIROLOGY**

Isolation of viruses in laboratory by tissue culture, Embryonated eggs and different laboratory animals, cell and tissue

culture technology, Animal cell lines

Principles of different serological tests used in Virology

#### **III Parasitology**

Morphology and diagnosis of Oral vaginal flagellates Trichomonas, E. Gingivalia

Morphology and life cycle of Haemoprotozoa Material parasite including falciparum

Laboratory diagnosis of Material infection

General characters and classification of Medical Helminthology

Morphology and life cycle of Nematodes(Intestinal) Ascaris, Enterobious, Ancylostoma, Trichuris, Strongloides

Laboratory diagnosis of intestinal nematode infection

Compound microscope optical systems,magnification and maintenance

## SEMESTER II

### **BSCMLT-202: Anatomy & Histotechnology**

Body fluids and their significance

Cardiovascular system

Alimentary system, mechanism and physiology of digestion and absorption

Liner structure and function

Urinary system

Genital system- male and female

Nervous system

Spleen, lymph node and reticuloendothelial system

Endocrine glands and their functions

Microtomes various types, their working principle and maintenance

Microtomes Knives and Knife sharpening

Practical section cutting, cutting faults and remedies

Routine staining procedures, mounting and mounting media  
Dye chemistry, theory and practice of staining  
Use of controls in various staining procedures  
Collection, processing and staining of cytological specimen

## **SEMESTER II**

### **BSCMLT-203: Haematology and Clinical Pathology**

Quality assurance in hematology

Hb : Definition ,synthesis and breakdown

Haemoglobinometry- various methods of estimation of Hb, errors involved and standardization of instrument for adaptation for Hb estimation

Haemocytometry Procedure for cell count(visual and electronic), Red cell count, leukocyte count, platelet count. Errors

involved and means to minimize such errors

Physiological variation in Hb , PCV , TLC , platelets

Erythrocyte sedimentation rate, factors influencing ESR, various methods of estimation and their significance

Haemocrit value by macro and micro methods their merits and demerits

Routine examination of urine

Examination of biological fluids such as CSF etc.

Examination of semen

### **BSCMLT-204: Biochemistry**

Radio isotopes and their use in biochemistry. Osmosis, dialysis, surface tension

Urine analysis(Qualitative)for sugar, proteins, bile pigments, Ketone bodies, porphobilinogen, faecal occult blood, bile salts

Collection and recording of biological specimens, separation of serum plasma preservation and disposal of biological

samples/materials

Basic statistics(mean, SD, CV, normal distribution, probability)

Volumetric analysis preparation of standard acid and base solutions, chloride estimation

## **SEMESTER II**

### **BSCMLT-205: Computer Application**

Introduction to Computers

Block diagram of a computer & overview of its working

Interconnections of various peripherals with computers

Input/Output & Secondary storage device

Classified of programming languages

Classification of computers

Familiarization with operating system

Introduction to Computer Operating System (Dos,Windows95/XP)

Introduction to DOS structure, system files, batch files & configuration files

Booting the system from floppy and hard disk

Brief introduction to DOS, Internal and External commands

Familiarization with windows structures, its use and application

Preparation of Documents through word processing

Idea of Text Editors like Microsoft Word, write etc.  
Opening a document  
Preparing documents, inserting diagrams and tables  
Editing documents  
Character, Word and line editing  
Margin setting, Paragraph alignment  
Block operations  
Spell checker  
Saving a document  
Printing a document  
Information Presentation for Decision making using Spreadsheet (Excel)  
Application of spread sheet  
Structure of spreadsheet  
Preparing spreadsheet for simple data and numeric operations  
Using formulae in spreadsheet operations  
Making tables, sorting and quering  
Creation of graphs, Pie charts, bar charts  
Printing reports  
Computer Aided Drafting (CAD)  
Making simple drawings using features of CAD and conforming the drafting specifications  
Saving and retrieving drawings  
Dimensioning  
Lettering  
Plotting drawings

#### **Practicles (4 hrs/ week)**

Identification of various parts of the PC  
Demonstration of dis-assembly and assembly of PC and interconnection of Input and Output devices to PC Installation of DOS and simple exercise on TYPE, REN,CD,MD,TREE,COPY,BACKUP commands  
Grouping commands with batch files  
Disk diagnose, Correction of partitioning  
Installation of windows 95  
Familiarization with start menu, taskbar icons, windows explorer  
Control panel of settings  
Getting hardware recognized  
Installation of MS-office  
MS-Word, Basics of Letterwriting,tempalates,wizards,formatting documents  
Creating Graphics, tables,mail merge,etc.. using MS-Word

Building a sample worksheet using MS-Excel  
Formulas for calculations, sorting etc..  
Creating Lotus 1-2-3 sheet  
Formulas, ranges and fuctions of Lotus 1-2-3  
simple Graphics  
Importing and exporting graphics through CAD  
Drawing of geometric figures

## **SEMESTER II**

### **BSCMLT-206: Practical**

Microbiology - 15 Marks

Anatomy & Histotechnology - 15 Marks

Haematology and Clinical Pathology - 15 Marks

Biochemistry - 15 Marks

Computer Application - 15 Marks

Internal Assessment : 25 Marks

## **SEMESTER III**

### **BSCMLT-301: Microbiology**

Identification of Bacteria- Micrococci, staphylococci pneumococci, corynebacteria, Escherichia, Klebsiella, Enterobacter,

Proteus, Providencia, Salmonella, Shigella, Arizona, Citrobacter, yersinia, Pseudomonas, Vibrio, Haemophilus, Mycobacteria,

Buccella, Bordetella, Bacillus, Clostridia, Anaerobic cocci, Neisseria, Treponema, Borrelia, Leptospria, Mycoplasma,

Rickettsia, Chlamydia, Tric agents

Identification of Pathogenic and Non Pathogenic fungi Candida, Gyptococci, Dermato phytes, spcerotrichoums, Histoplasma,

Blastomyces, Coccidioides, Para caccidiodes, Dematiaceous fungi, Mycetoma, Actinomyces, Nocardia and common

laboratory contains.

Biochemical tests used for identification of bacteria and fungi

Different staining techniques used in virology

Use of Embryonated eggs in clinical virology

Morphology and life cycle of haemoflagellates : leishmania, Trypansomes and their laboratory diagnosis

Morphology, life cycle and lab diagnosis of tissue and blood nematodes filaria, trichmella, sracunculus

Morphology, life cycle and laboratory diagnosis of intestinal cestodes Tanenia, Echinococcus, H. Nana, D.Latum

culture techniques for protozoa, amoeba, Giardia, Leishmania

Culture methods for Helminthis, Hookworm roundworm

## **SEMESTER III**

### **BSCMLT-302: Basic Cellular Pathology & Allied Technology**

Study of body tissues- Epithelial tissue, connective tissue including bone and cartilage, muscular tissue Study of various systems- Circulatory system, alimentary system, digestive system including liver, pancreas and gall bladder,

Respiratory system

Microscopy - Working principle, maintenance and applications of various types of microscopes - Darkground microscope,

polarizing microscope, phase contrast microscope, Interference microscope, U.V. light microscope, micrometry

Metachromasis and Metachromatic dyes

Haematoxylin stain, its importance in histology.

Stains, cytological preparation with special emphasis on MGG, PAPANTICOLOU stains.

Special stains like PAS, Mucicarmine, Alcian blue, Schmorl, Acid phosphatase

### **SEMESTER III**

#### **BSCMLT-303: Haematology**

History and discovery of blood group system

ABO and Rhesus blood group system

Compatibility tests in blood transfusion, complications and hazard of blood transfusion

Laboratory investigation of transfusion reactions and mismatched transfusions

Preparation of packed cells and various fractions of blood for transfusion purposes

Bone marrow aspiration, composition and functions

Staining of bone marrow smear and preparation of histological section

### **SEMESTER III**

#### **BSCMLT-304: Biochemistry**

Colorimetry, Spectrophotometry, Flamephotometry, Atomic absorption

spectroscopy, Electrometric determination of Na<sup>+</sup>

and K<sup>+</sup>, Chromatography, Electrophoresis, Radioimmunoassay (RIA) and ELISA

#### **BSCMLT-305: Practical**

Microbiology : 20 Marks

Basic Cellular Pathology & Allied Technology : 20 Marks

Haematology : 15 Marks

Biochemistry : 20 Marks

Internal Assessment : 25 Marks

## SEMESTER IV

### **BSCMLT-401: Microbiology**

Antimicrobial sensitivity testing and assay methods for body fluids  
Antimicrobial susceptibility testing for mycobacteria  
Preparation and standardization of antigens and antisera.  
Principles of animal cell culture and their use in virology  
Use of common Laboratory animals in viral diagnosis  
Egg counting Technique  
Preparation of stains and staining procedures of malaria  
Identification of different plasmodium species  
Preparation of media and maintenance of cultures of E. histolytica, Giardia, Leishmania,

### **SEMESTER IV**

#### **BSCMLT-402: Basic Cellular Pathology & Allied Technology**

Study of body tissues-Nervous tissue, glands, epithelial and endocrine.  
Study of various systems- urinary systems, system of endocrine glands, reproductive system, nerve endings and organs of special senses.  
Carbohydrates and amyloid -special stains and procedures  
Connective tissues, trichrome staining and other special stains for muscle fibers, elastic, and reticulate fibers and collages  
fibers.  
Principles of metal impregnation technique  
Demonstration and identification of minerals and pigments.  
Cytological screening and quality control in cytology laboratory.

### **SEMESTER IV**

#### **BSCMLT-403: Haematology**

Hemoglobin pigments and their measurement  
Abnormal hemoglobin and their means of identification and estimation  
LE cell estimation, various methods of its demonstration  
Homeostatic mechanism and theories of blood coagulation  
Physiochemical properties of coagulation factors  
Screening coagulation procedures  
Quantitative assay of coagulation factors

### **SEMESTER IV**

#### **BSCMLT-404: Biochemistry**

Introduction, properties and simple metabolism of carbohydrates, proteins and fats, Nucleic acids and Enzymes(introduction, General properties)

### **SEMESTER IV**

#### **BSCMLT-405: Practical**

Microbiology : 20 Marks

Basic Cellular Pathology & Allied Technology : 20 Marks  
Haematology : 15 Marks  
Biochemistry : 20 Marks  
Internal Assessment: 25 Marks

## SEMESTER V

### **BSCMLT-501: Microbiology**

Preservation of microbes and lyophilization methods  
Total and viable counts of bacteria  
Testing of disinfectants Rideal Walker Chick Martin and In use tests.  
Preparation and standardization of vaccines and immunization  
Bacteriological examination of water, milk, food and air.  
Nosocomial infections and sterility testing of I/V fluids and processing of various samples for hospital infections  
Toxin Antitoxin assays and pathogenicity tests  
Principles of serological techniques used in virology-HA, HA, Had, SRH,RPHA, IHA, CFT,CIEP.  
Mode of transmission of viral agents  
Morphology and life cycle of free living Amoebae, Balantidium, Toxoplasma  
Diagnosis of Morphology and life cycle of trematodes- Schistosomes, Intertinal flukes, blood flukes, wing flukes  
Serological and immunological techniques used in diagnosis of parasitic infections-Gel diffusion, IHA, IFA, ELISA,

## SEMESTER V

### **BSCMLT-502: Histopathology**

Handling of fresh histological specimen(tissues) cryo/frozen sections of fresh and fixed tissues, freeze drying.  
Lipids, identification and demonstration  
Micro-organisms in tissues- various staining technique for their demonstration and identification  
Nucleic acids, DNA and RNA special stains and procedures  
Cytoplasmic constituents and their demonstration  
Cervical cytology-basis of detection of malignant and premalignant lesions  
Hormonal assessment with cytologic techniques and sex chromatin and pregnancy tests.  
Cells and organs of immune system  
Immunoglobulins, antibodies and humoral immune response  
Allergy  
Rheumatological diseases and investigations.

## SEMESTER V

### **BSCMLT-503: Haematology**

Definition and classifications of anaemia  
Laboratory investigation for megaloblastic anaemia  
Laboratory investigation for iron deficiency Anaemia  
Laboratory investigation for haemolytic anaemia including classification and causes

Leukemia: definition and classification (General & FAB )  
Cytachemical staining procedure in various haemopoietic disorders.

#### **SEMESTER V**

##### **BSCMLT-504: Biochemistry**

Principles of assay procedures for biological materials Total proteins, albumin, Glucose, Urea, Uric acid, Creatinine, Cholesterol, Bilirubin. Sodium, Potassium, Chloride, Calcium and phosphorus. PBI, 17- Ketosteroids, Barbiturates

#### **SEMESTER V**

##### **BSCMLT-505: Practical**

Microbiology : 20 Marks  
Histopathology : 20 Marks  
Haematology : 15 Marks  
Biochemistry : 20 Marks  
Internal Assessment: 25 Marks

### **SEMESTER VI**

##### **BSCMLT-601: Microbiology**

Epidemiological markers of microorganism serotyping, Bacteriophage and Bacteriocine typing methods Lab diagnosis of common Bacterial infections viz:- pyogenic infections, Respiratory tract infections, Meningitis, Diphtheria, Whooping Cough, Gas gangrene, food poisoning, Enteric fever, Acute diarrhea diseases, cholera, Urinary tract infection, Tuberculosis, Leprosy, Plague, Anthrax, Typhus fever, syphilis, Gonorrhoea and other STD's Serological Tests-Widal, ASO, LFT, CRP, Rosewaller, brucella agglutination, cold agglutination, VDRL, TPHA, PTA-ABS  
Lab diagnosis of fungal infections Superficial dermatophyte fungal infections, Candidiasis, cryptococcosis, Pulmonary infections, Mycetoma, other deep mycotic infections, subcutaneous fungal infections subcutaneous fungal infections spozotrichosis, chromoblastomycosis, Eye and Ear fungi infections Serological tests for fungal infections and skin tests  
Advanced techniques in microbiology ELISA, RIA, CCIEA, Co-agglutination GLC, HPLC etc. Rapid diagnostic methods and Automation in Microbiology.  
Principles of Serological techniques used in virology- ELISA, RIA, IF, Immuno peroxidase test  
Prevention of viral disease  
Immunity in viral infection  
Introduction to Entomology Identification of Adultworms- mosquitoes, flies, ticks and fleas  
Animal care, handling and uses in parasitology.  
Preparation of parasitic antigens, antigens and antisera Handling and operating of sophisticated equipment.

## **SEMESTER VI**

### **BSCMLT-602: Histotechnology**

Tissues requiring special treatment i.e eye ball, Bone marrow biopsy, undercalcified bones.

Neuropathologic techniques

Enzyme histochemistry demonstrations of phosphatases, dehydrogenases oxidases and peroxidases etc.

Electron microscope, working principle, components and allied techniques for electron microscopy, ultra-microtomy

Museum techniques

Aspiration cytology principles, indications and utility of the technique with special emphasis on role of cytotechnician in

FNAC clinics

Infection and immune system

Cancer Immunology

Tissue typing for kidney transplant

## **SEMESTER VI**

### **BSCMLT-603: Haematology**

Laboratory tests for assessing bleeding disorders

Laboratory investigation for disseminated intravascular coagulation(DIC)

Mechanism of fibrinolysis test for fibrinolysis

Platelet function tests and their interpretation

Techniques available for cytogenetic studies

Use of Radioisotopes in hematology

Safety measures for handling Radioisotopes

## **SEMESTER VI**

### **BSCMLT-604: Biochemistry**

Glucose tolerance test, insulin tolerance test, gastric analysis, xylose absorption test, clearance test for renal function-

Enzymes Acid and alkaline phosphates, AST, ALT, Amylase and lactate dehydrogenase, CPK

Analysis of calculi and CSF

Quality control of clinical investigations, Automation in clinical biochemistry laboratory, laboratory organisation management and maintenance of records.

## **SEMESTER VI**

### **BSCMLT-605: Practical**

Microbiology : 20 Marks

Histopathology : 20 Marks

Haematology : 20 Marks

Biochemistry : 15 Marks

Internal Assessment: 25 Marks