BMLT III YEAR COURSE OUTCOME
SUBJECT –CLINICAL BIOCHEMISTRY

S. NO.	TOPIC	COURSE OUTCOME
1	Principles of the assay procedure for biological materials (Total protein, albumin, glucose, urea, uric acid, creatinine, cholesterol, bilirubin etc.)	After the completion of this topic, students shall be able to understand the determination of different types of substance in serum. And also know their normal and abnormal values.
2	Protein Bound Iodine	After the end of this topic students shall be able to know introduction of PBI and their normal and abnormal range in serum. And also demonstrate the test in biochemistry labs.
3	17- Ketosteroids	Students shall be able to perform the test in urine to identification of different types of syndrome.
4	Analysis of Calculi	Students shall be capable to determine the urine analysis for identification of calculi. Also know procedure to perform test and their normal values,
5	Quality control of clinical investigation	Students shall be able to aware controls of specimen, investigation and results outcome.

		And also maintain the standard laboratory protocol.
6	Automation in clinical biochemistry laboratory	After the end of this topic students shall be capable to understand basic of advanced techniques used in biochemistry labs. And also understand the types of machine, their working principle and results outcomes.
7	Laboratory organization, management and maintenance of records	In this topic students know about basic laboratory ethics and instrument/equipment's management and also record the all documents.
8	Clearance test for renal function	Students able to understand clinical significance and how to perform clearance test for renal function .
9	Enzymes- acid and alkaline phosphatase	Students shall be understand determination of acid and alkaline phosphatase in serum.
10	AST (Aspartate transaminase)	In this topic students able to understand the term of AST. Understand the procedure of Determination of AST.
11	ALT (Alanine transaminase)	In this topic students able to understand the term of ALT. Understand the procedure of

		Determination of ALT.
12	Amylase And Lactate Dehydrogenase	In this topic students able to understand the process of amylase and lactate dehydrogenase. Understand the Principle and determination of amylase and lactate dehydrogenase. Understand the clinical significance of amylase and lactate dehydrogenase.
13	CPK	In this topic students able to understand the Principle ,clinical significance and procedure of determination of CPK.
14	Analysis of calculi	In this topic students able to understand the analysis of calculi Understand the Types of calculi and their identification.
15	Analysis of CSF	In this topic students able to understand the analysis of CSF Understand Its composition and its Routine analysis.
16	Quality control of clinical investigation	In this topic students able to understand the quality control term and its importance. Understand the methods of quality control in clinical investigations.
17	Automation in clinical biochemistry laboratory	In this topic students able to understand the term and use of automation.

		Understand the methods of automation
18	Laboratory organization management and maintenance of records	Students should able to understand to how organize the laboratory and their management. Understand to how maintain the records in laboratory.

HISTOLOGY

S. NO.	TOPIC	COURSE OUCOME
1	APPLIED HISTOLOGY –	• HANDLING of fresh histological specimens(tissue) Cryostat/frozen sections of fresh an fixed tissues Freeze-drying. At the end of this topic student mus should be able to- 1) Handle the fresh histological spec 2) Understand the fresh & fixed tissu how to freeze Drying for cryostat or frozen secti • LIPIDS,IDENTIFICATION AND DEMONSTRATION At the end of this topic student must shou able to- 1) Understand the lipid &there diffe types of identification And demonstration in histology. 2) Understand the method to how to the slide for lipid Identification. • MICRO-ORGANISM IN THE TIS – VARIOUS STAINING, TECHNIQUES FOR THEIR DEMONSTRATION & IDENTIFICATION. At the end of this topic student mus should be able to- 1) Understand the micro-organism,v are present in tissues.

		2) Understand the various staining techniques of micro-organism in t • NUCLEIC ACIDS , DNA &RNA SPECIAL STAINS AND PROCED At the end of this topic student mus should be able to- 1) Understand the nucleic acid specia stain. 2) Understand the parts of Nucleic A and their special stain procedure. • CYTOPLASMIC CONSTITUENT AND THEIR DEMONSTRATION At the end of this topic student mus should be able to – 1) Understand the constituent of cytoplasm. 2) Understand the staining methods cytoplasmic constituents. • TISSUE REQUIRING SPECIAL TREATMENT i.e EYE BALL B.M BIOPSY UNDER CALCIFIED BONES. At the end of this topic student must sh be able to- 1) Understand the tissue requiring special treatment like eye ball. 2) Understand the technique to hov the biopsy method under calcifie Bones.

2	NEUROPATHOLOGY TECHNIQUES	At the end of this topic student must sl be able to- 1) Understand the techniques of neuropathology. Enyme histology demonstration of phosphate, dehydrogenises,oxidize peroxidize. At the end of this topic student should able to- 1)Understand the term of eny histochemistry 2) Understand the demonstration phosphate, dehydrogenises, oxidi per oxidize. Electron microscope , working pr , components & allied technique for electr Microscopy , ultra–microtome. At the end of this topic student Should b to – 1) Understand Electron microscope principle & their types . 2) Understand the working of elect microscope. 3) Understand the different compo & allied technique for electron microscope 4) Understand the technique of ul microtome.

3	• MUSEUM TECHNIQUE –	At the end of this topic student Sho able to – 1) Understand the museum techniq 2) Understand the different type of museum technique
4	Cytology	Cervical Cytology basic of detection of malignant & pre malignant lesion - At the end of this topic student should be to- • Understand the term of Cervical cy and their different types. • Understand the detection of Malign and Pre-malignant lesions. 2 Hormonal assessments with Cytolog techniques and sex chromatin and Preg test- At the end of this topic student shoul able to- • Understand the term of Hormonal assessment with Cytological techni • Understand the technique of Sex chromatin for Hormonal assessmen • Understand the technique of Pregna test. Aspiration cytology Principles , indica and utility of the technique with specia emphasis on role of cytotechnician in Clinics – At the end of this topic student should able to – • Understand the Aspiration cytology Principles.

		• Understand the indications and util the techniques. • Understand the technique of FNAC
5	IMMUNOPATHOLOGY :-	Cells and organs of the immune system – At the end of this topic student should be – • Understand the cells and organ of t immune system. • Understand the different types of c and their function. • Understand the different types of o of the immune system and their fun Immunopathology. Immunoglobulins , Antioxides and Hu immune system – At the end of this topic student should able to – • Understand the different types of Immunoglobulins and there functio human body. • Understand the antioxides and thei function. • Understand the Humeral immune s and their work in immunology. Allergy – At the end of this topic student should able to – • Understand the term allergy and ty allergy. Rheumatologic disorder and investigat At the end of this topic student should

		able to – • Understand the Rheumatologic dise • Understand the RF Factor and their Investigation. Infection and The Immune system – At the end of this topic student should able to – • Understand the term of Infection an tyoes. • Understand the work of infection in immune system. Cancer Immunology – At the end of this topic student Should able to – • Understand the term cancer. • Understand the work of immune sy in cancer disease. Tissue typing for Kidney Transplant – At the end of this topic student should able to – • Understand the Transplantation and types. • Understand the Kidney transplantat and tissue typing for kidney transpl

BMLT III YEAR COURSE OUTCOME
SUBJECT- APPLIED HAEMATOLOGY

S. NO.	TOPIC	COURSE OUTCOME
1.	**DEFINITION & CLASSIFICATION OF ANEMIA**	**At the and of this topic student must should be able to…** • **Understand its introduction.** • **To understand its different types of classification and anemic cells like macrocytic, microcytic normocytic anemia cells .** **Understand different type of diagnostic**
2.	**LABORATORY INVESTIGATION FOR MEGALOBLASTIC ANEMIA**	At the and of this topic student must should be able to… • Understand its introduction. • To understand the classification of megaloblastic anemia • Understand the identify vitamin B12 AND folic acid deficiency • Understand its lab diagnostic & megaloblastic • Understand its identify the peripheral blood smear showing characteristic og megaloblastic anemia

3.	**LABORATORY INVESTIGATION FOR IRON DEFICIENCY ANEMIA**	At the and of this topic student must should be able to… • Understand its introduction. • To understand the symptoms of iron deficiency anemia • Understand the normal value of iron in human body • Understand lab diagnosis of iron deficiency anemia
4.	**LABORATORY INVESTIGATION FOR HEMOLYTIC ANEMIA INCLUDING CLASSIFICATION & CAUSES**	At the and of this topic student must should be able to… • Understand its introduction. • To understand the definition of hemolytic anemia. • Understand the causes of hemolytic anemia . • Understand its lab diagnosis.
5.	**LEUKEMIA DEFINITION & CLASSIFICATION**	At the and of this topic student must should be able to… • Understand its introduction. • To understand classification ALL,AML,CLL,CML • To understand fab classification • To understand treatment of leukemia • To understand lab diagnostic
6.	**CYTOCHEMICAL STAINING PROCEDURES IN VARIOUS HEMATOPOIETIC DISORDERS**	At the and of this topic student must should be able to… • Understand its introduction. • To understand various types of staining method like PAP & PAS staining • To understand the identify various types of cells and its procedure

		• To understand its definition & condition in which blood clots from throughout the body. • Understand all clotting factor
7.	**LABORATORY INVESTIGATION FOR DISSEMINATED INTRAVASCULAR COAGULATION (DIC).**	At the and of this topic student must should be able to… • Understand its introduction. • To understand its definition & condition in which blood clots from throughout the body. • Understand all clotting factor. • Student should be perform BT,CT,APTT test .
8.	**MECHANISM OF FIBRINOLYSIS: TEST FOR FIBRINOLYSIS**	At the and of this topic student must should be able to… • Understand its introduction. • To understand definition and clotting factors • To understand different types of test like fibrin, degradation product (FDP)
9.	**PLATELET FUNCTION TEST AND THEIR INTERPRETATION**	At the and of this topic student must should be able to… • Understand its introduction. • To understand the function of the platelet • Understand procedure of platelet function test
10.	**TECHNIQUES AVAILABLE FOR CYTOGENETIC STUDIES**	At the and of this topic student must should be able to… • Understand its introduction.

		• To understand history & importance of cytogenetics • To understand its method and procedure.
11.	**USE OF RADIOISOTOPES IN HEMATOLOGY**	At the and of this topic student must should be able to… • Understand its introduction. • To understand for in vivo studies involving leblling of cell in blood • To understand its techniques
12.	SAFETY MEASURES FOR HANDLING RADIOISOTOPES	At the and of this topic student must should be able to… • Understand its introduction. • To understand its different points of handling • To understand radioisotopes safety.

BMLT III YEAR COURSE OUTCOME
SUBJECT- APPLIED MICROBIOLOGY

S. NO.	TOPIC	COURSE OUTCOME
1.	Preservation of Microbes and Lyophilisation methods	After the studying of this topic, students shall be able to understand to explain how to preserve of microbes for laboratory and research use. And also understand the various methods of preservation.
2.	Total and Viable count of Bacteria	After the studying of this topic, students shall be able to understand to count represents the number of colony forming units (cfu) per/g of the sample. live and dead microbes in the culture plate. And students able to understands use of counting in food factory and diagnosis of various types of infection.
3.	Testing of Disinfectants- Rideal-Walker, Chick-Martin use and tests	Study of this topic to understand the role of sterilization in microbiology laboratory and able to the interpretation of data of microorganism present in the laboratory.

4.	Preparation and Standardization of Vaccine and immunization schedule	After studying student able to classify the type of vaccine and also understand the various type of method to prepare vaccine. And also understand the how to apply vaccine for various types of infection.
5.	Bacteriological examination of water, milk, food and air	At the end of this topic students able to understands that the various type of method to analyze the water contamination and able to identify the types of pathogenic organism present in the water, food and air.
6.	Nosocomial infection and sterility testing of I.V. fluids and processing of various samples for hospital infections	This topic helps understand of environmental infection presence of pathogenic organism and able to identify the hospital acquired infection. And also understand how to handling of specimen for diagnosis of infection.
7.	Toxin-Antitoxin assays and Pathogenicity tests	After the studying of this topic, students shall be able to understand the various types of antigen and the role of pathogenicity of microorganism.
8.	Epidemiological markers of microorganism serotype, Bacteriophage and Bacteriocin typing methods	After studying student able to understand the phage typing to classify strains from clinical and subclinical and microorganism typing by strain level. And also determine the source and route of infection. To differentiate virulent strain from

		avirulent strain of same species.
Laboratory Diagnosis Of Common Bacterial Infections		
9.	Pyogenic infections	Student able to understand different types of pathogenic organism presence in the sample and pathogenic microorganism to cause pyogenic infection and also role of pyogenic infection in human.
10.	Respiratory tract infections	Student able to understand the which organism come and cause the Respiratory tract infections. It is able to identify the pathogenic organism. Source and route of infection. Student able to understand determine the source and route of infection and laboratory diagnosis.
11.	Diphtheria	Student able to understand the which organism come and cause the throat infections. It is also able to identify the pathogenic organism. Source and route of infection.
12.	Whooping cough	Student able to understand the which organism come and cause thehighly contagiousRespiratory tract infection. It is also able to identify the pathogenic

		organism. Source and route of infection.
13.	Gas gangrene	Student able to understand the which organism come and cause thehighly contagious arms and legs infection. It is also able to identify the pathogenic organism. Source and route of infection.
14.	Acute diarrheal diseases	Student able to understand the which organism come and cause Watery or bloody diarrhea, abdominal pain and nausea preceded by muscle pain. It is also able to identify the pathogenic organism. Source and route of infection.
17.	Cholera	Student able to understand the which organism come and cause epidemic infectious disease. It is also able to identify the pathogenic organism. Source and route of infection.
18.	Urinary tract infection	Student able to understand the which organism come and cause female genital disease in lower urinary tract. It is also able to identify the pathogenic organism. Source and route of infection.
19.	Tuberculosis	Student able to understand the which organism come and cause the contagious Respiratory infections. It is able to identify the pathogenic organism. Source and route of infection.

20.	Leprosy	Student able to understand the which organism come and cause disfiguring skin sores and curable infectious. It is also able to identify the pathogenic organism. Source and route of infection.
21.	Plague	Student able to understand the which organism come and cause the bacterial infection that's transmitted by fleas. It is also able to identify the pathogenic organism. Source and route of infection.
22.	Anthrax	Student able to understand the which organism come and cause thehighly contagious skin and lungs infection. It is also able to identify the pathogenic organism. Source and route of infection.
23.	Gonorrhoea	Student able to understand the which organism come and cause by sexual activity. It is also able to identify the pathogenic organism. Source and route of infection.
24.	Serological Test- Widal, ASO, LET, CRP, Rosewaller, Brucella agglutination test, Cold agglutination, VDRL, TPHA, FTA-ABS	Student able to understand the immune deficiencies associated with the lack of antibodies and serological test to determine the antigen antibody test.
Laboratory Diagnosis Of Fungal Infection		
25.	Superficial Dermatophyte	Student able to understand the which

		organism come and cause skin, hair and nails. It is also able to identify the pathogenic organism. Source and route of infection.
26.	Candidiasis	Student able to understand the which organism come and cause vaginal yeast infection. It is also able to identify the pathogenic organism. Source and route of infection.
27.	Cryptococcosis	Student able to understand the which organism come and cause fatal fungal disease. It is also able to identify the pathogenic organism. Source and route of infection.
28.	Pulmonary infection	Student able to understand the which organism come and cause the contagious Respiratory infections by the wide range of organisms. It is able to identify the pathogenic organism. Source and route of infection.
29.	Mycetoma	Student able to understand the which organism come and cause bychronic inflammation of the tissues. It is able to identify the pathogenic organism. Source and route of infection.
30.	Serological tests for fungal	At the end of this study students should

	infections and skin tests	be know about the different types of antigen and antibody test used in identification of fungal disease.
31.	Advanced Techniques in Microbiology- ELISA, RIA, CCIEP, CO-agglutination GLC, HPLC	Students should be able to know about Advanced technology and their working principle, procedure and result outcomes. Students also know difference between conventional and newer technology
32.	Rapid diagnostic methods and Automation in Microbiology	Students should be able to know types of automation technique and applied in clinical field.
33.	Principles Of Serological Techniques Used In Basic Virology Methods - HA, HAI, HAD, SRB, RPHA, IHA, CFT, CIEP, ELISA, RHA, IF, Immunoperoxides Test	At the end of this study students should be able to know various types of serological methods to used in diagnosis of diseases and their basic principle and result outcomes with normal and abnormal values.
34.	Mode of transmission of viral agents	Students able to know about in this topic that different types of source of viral infection i.e. blood, stool, urine, air, water etc.
35.	Prevention of viral diseases	Students should be aware types of vaccine and their immunization schedule in different types of viral diseases.
36.	Immunity in viral infections	Students should be know about human immunity and their symptoms to cause vial diseases.
Parasitology		

37.	Morphology and life cycle of free living Amoebae- Balantidium, Toxoplasma	After the studying of this topic students should be able to understand parasitic infection and their morphology, source of infection and life cycle of related parasite.
38.	Diagnosis, Morphology and life cycle of Trematodes, Schistomas, Intestinal Parasites, Blood parasites, Lung parasites	At the end of this topic students know about the identification and determination of different types of tr
39.	Serological and Immunological Techniques used in Diagnosis- Gel-diffusion, IHA, IFA, ELISA	Students shall be able to understand different type of serological technique and their working principle and also know applications of test.
40.	Introduction and identification of Mosquitoes, Flies, Ticks	Students shall be able to know how to mosquito, flies and ticks will responsible to cause diseases and also know about their prevention and vector control. And students aware their identical features.
41.	Laboratory diagnosis of Malarial infection	Students shall be understand that what kind of different species of plasmodium to responsible for malarial infection and also know laboratory diagnosis procedure.
42.	General characters and classification of Medical Helminthology	At the end of this topic students should be able to know basicsalient features of parasites belong to helminths. i.e. Taenia

43.	Morphology, life cycle and laboratory diagnosis of intestinal Nematodes infection	Students shall be understand the types of nematodes and their morphology, life cycle and identification of common intestinal parasitic infection.