EKLAVYA
UNIVERSITY
ज्ञानप्राप्तये लक्ष्यसन्धानम्
Sagar Road, Damoh (M.P.),Bharat

Eklavya University, Damoh (MP)

B.M.L.T. IIIrd Year

Syllabus 2022-23

School of Nursing & Paramedical Science

EKLAVYA UNIVERSITY
ज्ञान प्राप्तये लक्ष्य संधानम्

School of Nursing and Paramedical Sciences

BACHELOR IN MEDICAL LAB TECHNOLOGY (BMLT)
SCHEME Of EXAMINATION: BMLT-3rd Year

S.No.	Subject Code	Subject	University Examination Theory	Internal Assessment	External Practical	Total
1	**BMLTE20Y301**	Applied Histopathology	100	100	100	300
2	**BMLTE20Y302**	Microbiology-III	100	100	100	300
3	**BMLTE20Y303**	Biochemistry-III	100	100	100	300
4	**BMLTE20Y304**	Hematology-III	100	100	100	300
9	**BMLTE20Y305**	Instrumentation		50		50
					Total Max. Marks	**1250**

N.B.-Internal Assessment marks will be added in theory marks; candidate have to get min. 50% marks i.e.-100 marks in theory and internal assessment collectively for passing the examination and in practical he/she should get 50% marks i.e.-50 marks to get pass.

EKLAVYA UNIVERSITY
ज्ञान प्राप्तये लक्ष्य संधानम्
Estd. by Madhya Pradesh Niji Vishwavidyalaya (Sthapna Avam Sanchalan) Adhyadesh, 2020

School Of Nursing & Paramedical Science

Department of Paramedical

SYLLABUS

Bachelor of medical laboratory technician (BMLT)

3 YEAR DEGREE COURSE

Year	**BMLT 3rd Year**
Subject	**Applied Histopathology**
Time	**75 Hrs**

06

Course code	Applied Histopathology	
BMLTE20Y301		
Pre-requisite	Nil	Syllabus version

Course Objectives:

1. To understand the theoretical prospects of cytology
2. To know the microscopic examination of tissue in order to study the manifestation of disease.
3. understand the decalcification and their methods
4. It also refers to the examination of biopsy or surgical specimen.
5. It is also help to know the useful and accurate diagnosis.

Course Outcome:

1. Students will be able to understand pathology and diagnose the diseases on the cellular level.
2. Students will be conversant with the basic knowledge of the parasitic infections of humans.
3. Students will learn how parasites gain access to, and survive within their hosts.
4. Students will be able to understand and control parasitic infections.
5. Students will be able to differentiate between normal and abnormal cells

Student Learning Outcomes (SLO):

1. Students will be able to demonstrate and identify various staining techniques.
2. Students will be able to identify the basic structure of cells.
3. Students will be able to identify and describe theoretical background of surgical cutup ,tissue fixation and tissue processing.
4. Students will be able to handle histological specimen.

Unit – 1	**15**

APPLIED HISTOLOGY : Handling of fresh histological specimen, cryo/frozen section of fresh and fixed tissue, freeze drying, Lipid identification and demonstration, Micro-organism in the tissue-various staining techniques for their demonstration and identification, Nucleic acid ,DNA and RNA special stains and procedures, Cytoplasmic constituent and their demonstration, Tissue requiring special treatment i.e eye ball, B.M.biopsy ,under calcified bones.

Unit – 2	**15**

Tissue requiring special treatment i.e eyeball, B.M.biopsy ,under calcified bones, Neuropathology techniques, Enzyme histochemistry demonstration of phosphatase, dehydrogenase, oxidase and peroxidase

etc, Electron microscope ,their working ,component and allied techniques for electron microscopy, Ultra microtomy, Museum technique.	
Unit – 3	
CYTOLOGY Cervical cytology –basis of detection of malignant and pre malignant lesions, Hormonal assessment with cytological techniques and sex chromatin and pregnancy test, Aspiration cytology principles, indications and utility of technician in FNAC clinics.	**15**
Unit – 4	
IMMUNOPATHOLOGY: Cells and organs of immune systems, immunoglobulin's antibodies and human oral immune response, Allergy Rheumatologic diseases and investigations, Infection and the immune system, Cancer immunology, Tissue typing for kidney transplant.	**15**
Unit – 5	
Rheumatologic diseases and investigations, Infection and the immune system, Cancer immunology, Tissue typing for kidney transplant.	**15**
Practical	
1. To study the working principle, component and application of electron microscope. 2. To do the gram staining of paraffin section. 3. To do the staining of FNAC specimen by using H and E staining method. 4. To do the weak acid fast staining. 5. To do the AFB staining of the paraffin section. **6.** To do the papanicolaous of the smear.	
# Mode: Flipped Class Room, Case Discussion, Lectures.	
1.Barbara H. Estridge, Anna P. Reynolds, Basic Clinical Laboratory Techniques, Cengage Learning 6th edition. 2.Kawai T, Akira S (February 2006), "Innate immune recognition of viral infection" Nature Immunology. 3.Plotkin SA (April 2005). "Vaccines: past, present and future", Nature Medicine 4. Text Book of Medical Laboratory Technology 5th edition – Praful B. Godkar.	

08

EKLAVYA UNIVERSITY
ज्ञान प्राप्तये लक्ष्य संधानम्
Estd. by Madhya Pradesh Niji Vishwavidyalaya (Sthapna Avam Sanchalan) Adhyadesh, 2020

School Of Nursing & Paramedical Science

Department of Paramedical

SYLLABUS

Bachelor of medical laboratory technician (BMLT)

3 YEAR DEGREE COURSE

Year	**BMLT 3rd Year**
Subject	**Microbiology - III**
Time	**75 Hrs**

Course code	Microbiology – III	
BMLTE20Y302		
Pre-requisite	Nil	
		Syllabus version

Course Objectives:

1.To explain the general and specific structure of microorganism.
2.To understand basic serological methods.

Course Outcome:

1. Students will be able to explain the general and specific structure of microorganism
2. The course will provide basic understanding of various types of cells and organisms.
3. Students will be able to understand how to grow and control microorganisms.
4. The course will provide the conceptual basis for understanding pathogenic microorganism and particularly address the fundamental mechanisms of their pathogenicity.
5. 5. Student will be able to explain to prevent infectious diseases including infection control measures.

Student Learning Outcomes (SLO):

1. Students will be able to demonstrate their ability to perform an appropriate primary/initial assessment of the ill or injured patient in the prehospital setting.
2. Students will be able to demonstrate their ability to perform an appropriate secondary/focused history and physical exam of the trauma patient in the pre-hospital setting.
3. Students will be able to perform an appropriate secondary/focused history and physical exam for patients with medical complaints or signs and symptoms in the pre-hospital setting.
4. Students will be able to formulate an appropriate treatment plan to include administration of IV fluids and/or pharmacological medications for the trauma patient in the prehospital setting.

Unit – 1 **15**

Preservation of microbes and lyophilisation methods. Total and viable count of bacteria. Testing of disinfectant Rideal –walker, Chick Martin, In use test. Preparation and standardization of vaccines and immunization schedule .Bacteriological examination of water milk ,food and air.

Unit – II **15**

Nosocomial infections and sterility testing of IV fluids and processing of various samples for hospital infections. Toxin-Antitoxin Assay and pathogenicity tests. Epidemiological markers of micro-organisms serotyping, bacteriophage and bacteriocin typing method. laboratory diagnosis of common bacterial infections-pyogenic infections, respiratory tract infections, meningitis, diphtheria ,whooping cough, gas gangrene, food poisoning, enteric fever, acute diarrheal disease, cholera, urinary tract infections,

tuberculosis, leprosy, plague, anthrax, typhoid fever, syphilis, gonorrhea and others STDs disease.

Unit – 3 **15**

Serological test. Widal ,ASO Titer LET,CRP, Rosewaller brucella agglutination, cold agglutination, VDRL,TPHA FTA – ABS. laboratory diagnosis of fungal infections Superficial dermatophyte, fungal infections, candidiasis infection, cryptococcosis, pulmonary infections, Mycetoma, other deep mycoticinfections, subcutaneous fungal infections - Sporotrichosis, chromoblasato mycosis, eye and ear fungal infections. Serological test for fungal infection and skin tests. Advance techniques in microbiology – ELISA , RIA ,CCIE, Coagglutination, GLC,HPLC etc. Rapid diagnostic method and automation in microbiology.

Unit – 4 **15**

BASIC VIROLOGY METHODS :Principles of serology techniques used in virology – PART I : HA,HAI,HAB,SRB RPHA, JHA, CET, CIEP .Principles of serology techniques used in virology – PART II Ht , ELISA, RIA, IF, Immuno-ferooxidase test. Mode of transmission of viral agent. Prevention of viral diseases.Immunity of viral infection.

Unit – 5 **15**

PARASITOLOGY: Morphology and life cycle of Free Living Amoeba Balantidium ,Toxoplasma. Diagnosis of morphology and life cycle of trematodes Intestinal flukes, Blood flukes, Lung flukes Serological & immunological technique used for the diagnosis of gel diffusion, THFA, IFA. ELISA, indirect fluorescent antibody.

Practical

1. To study working principle of various microscope, care and maintenance.
2. Bacteriological examination of milk methylene blue Test.
3. Complete Test for coliform Bacteria.
4. To study the fungal contamination from stored agriculture product using blotter test.
5. To perfom widal Test.
6. To study bacterial by gram staining method.
7. Bacteriological examination of water presumptive coliform bacteria.
8. Streak plate method from mixed culture to pure culture.

 # Mode: Flipped Class Room, Case Discussion, Lectures.

Suggested Reading:

1.Mackie & McCartney, "Immunology Microbiology"

2. Gunasekharan, "Laboratory Manual of Microbiology"

3. Fleck & Moody, "Diagnostic Techniques of Medical Parasitology"

4. Halls & Sohantz, "Immuno diagnosis of Parasitic diseases".

EKLAVYA UNIVERSITY
ज्ञान प्राप्तये लक्ष्य संधानम्
Estd. by Madhya Pradesh Niji Vishwavidyalaya (Sthapna Avam Sanchalanal) Adhyadesh, 2020

School Of Nursing & Paramedical Science

Department of Paramedical

SYLLABUS

Bachelor of medical laboratory technician (BMLT)

3 YEAR DEGREE COURSE

Year	**BMLT 3rd Year**
Subject	**Biochemistry - III**
Time	**75 Hrs**

Course code	Biochemistry - III	
BMLTE20Y303		
Pre-requisite	Nil	Syllabus version

Course Objectives:

1. To understand the bioassay and biochemistry tests.
2. To make students conversant with organ function and their tests..
3. To have knowledge of inborn errors of carbohydrate, protein, lipid and nucleic acid metabolism.
4. To understand basic principles for assay procedure for biological material.
5. To understand glucose tolerance test, Clearance test for renal function.

Course Outcome:

1. Students will understand about the results, references and interpretations of the lab results.
2. Students will understand about the safety protocols, code of ethics and conduct.
3. Students will gain experience about live laboratory environment.
4. Students will understand automation in clinical biochemistry laboratory.

Student Learning Outcomes (SLO):

1. Students will understand the bioassay and biochemistry tests.
2. Students will be conversant with organ function and their tests..
3. Students will have knowledge of inborn errors of carbohydrate, protein, lipid and nucleic acid metabolism
4. Students will be able to understand basic principles for assay procedure for biological material.
5. Students will be able to understand glucose tolerance test procedure.

Unit – 1	15

Principle for assay procedure for biological material- Protein ,Total albumin, Glucose, Urea, Uric acid, Creatinine, Cholesterol Bilirubin, Sodium, Potassium, Chloride, Calcium, Inorganic phosphates PBD 17 ketosteroids, Barbiturates .

Unit – 2	15

Glucose tolerance test(GTT), Insulin tolerance test(ITT) gastric analysis, Xylose absorption test.

Unit – 3	15

Clearance test for renal function. Enzyme-acid and alkaline phosphatase. AST ALT.

Unit – 4	15

Amylase lactate dehydrogenase CPK , Analysis of calculi and CSF Quality control of clinical investigations
Unit - 5
Automation in clinical biochemistry laboratory. Laboratory organizations. Management and maintenance of records. **15**
Practical
1. Estimation of blood sugar (Glucose). 2. Estimation of Total protein. 3. Determination of serum albumin. 4. Determination of serum, urea, nitrogen. 5. Determination of serum creatnine. 6. Determination of serum bilirubin of autoanalyzer. 7. Determination of alkaline phosphate. 8. Demonstration of AST.
 # Mode: Flipped Class Room, Case Discussion, Lectures.
Suggested Reading: 1. Text Book of Medical Laboratory Technology 5th edition – RamnikSood. 2. Text Book of Medical Laboratory Technology 5th edition – Praful B. Godkar. 3. Richard Harvey, Denish Ferrier. Lippincott's Illustrated Reviews Biochemistry 5th edition 4. Dr. Rajagopal & Dr. B.D Toora , "Practical Biochemistry" Ahuja Publishing House 5. K.P Sinha , "Manual of Practical Biochemistry",Scientific Book Company.

EKLAVYA UNIVERSITY
ज्ञान प्राप्तये लक्ष्य संधानम्
Estd. by Madhya Pradesh Niji Vishwavidyalaya (Sthapna Avam Sanchalanal Adhyadesh, 2020)

School Of Nursing & Paramedical Science

Department of Paramedical

SYLLABUS

Bachelor of medical laboratory technician (BMLT)

3 YEAR DEGREE COURSE

Year	**BMLT 3rd Year**
Subject	**Hematology - III**
Time	**75 Hrs**

Course code	Hematology - III	
BMLTE20Y304		
Pre-requisite	Nil	
		Syllabus version

Course Objectives:

1. Students will have knowledge of various investigations required for diagnosis of anemia and leukemia.
2. To make students able to perform investigations required for assessment of bleeding disorders.
3. To be proficient with applications of cytogenetic studies
4. To understand cross-matching and compatibility tests required before blood transfusion.
5. To understand Laboratory investigations of haemolytic anaemia including classification and causes, Leukemia

Course Outcome:

1. To know about blood and components of blood
2. To be able to separate blood components and carry out necessary testing.
3. To understand about diseases carried through blood and protection.
4. To know about various techniques employed in blood for and gain expertise in instruments used in blood bank.
5. To enable a student to work in a blood bank

Student Learning Outcomes (SLO):

1. Students will be able to separate blood components and carry out necessary testing.
2. Students will understand about diseases carried through blood and protection.
3. Students will be able to know about various techniques employed in blood for and gain expertise in instruments used in blood bank.
4. Students will enable to work in a blood bank.

Unit – 1	
Definition and classification of Anaemia's. Laboratory investigations of megaloblastic anaemia. Laboratory investigations of iron deficiency anaemia.	15

Unit – 2	**15**
Laboratory investigations of haemolytic anaemia including classification and causes,,Leukaemia definition and classification. Cytochemical staining procedures in various haemopioetic disorder.	
Unit – 3	**15**
Laboratory test for assessing bleeding disorder. Mechanism Laboratory investigation for disseminated intravascular(DIC) coagulation of fibrinolysis .	
Unit – 4	**15**
Platelets function test and their interpretation, Test for fibrinolysis.	
Unit – 5	**15**
Uses of radio-isotopes in haematology, Safety measures for handling radio-isotopes.	
# Mode: Flipped Class Room, Case Discussion, Lectures.	

1. Textbook of Medical Laboratory Technology (Set of 2 Volumes) : Clinical Laboratory Science and Molecular Diagnosis (English) 3rd Edition (Hardcover)
2. Textbook of Medical Laboratory Technology (Set of 2 Volumes)
3. Baker et al, " An introduction to medical laboratory technology",Elsevier.
4. Charles F. Seiverd,"Hematology for medical technologists", Lea & Febiger
5. Arthur Simmons,"Technical hematology", Lippincott, 4. Thomson J: Blood coagulation and homeostasis,CBS Publisher,

Practical

1. Demonstration of magaloblastic anaemia Requirements:P.S Of Slide with picture
2. Investigation Iron deficiency anaemia Hb% , R.B.C., P.C.V. Red cell indices, Bone, - marrow staining Requirements.
3. Demonstration of (Reticulocyte Count)Requirements:
4. Demonstration of (Sickling Test)
5. Demonstration of (Coomb's Test) Requirements:
6. Demonstration of assessing bleeding disorders.
7. Demonstration of P.Smear of Acute leukemia (CML,AML,All Multiple Myloma)

EKLAVYA UNIVERSITY
ज्ञान प्राप्तये लक्ष्य संधानम्
Estd. by Madhya Pradesh Niji Vishwavidyalaya (Sthapna Avam Sanchalanat) Adhiyadesh, 2020

School Of Nursing & Paramedical Science

Department of Paramedical

SYLLABUS

Bachelor of medical laboratory technician (BMLT)

3 YEAR DEGREE COURSE

Year	**BMLT 3rd Year**
Subject	**SCHEME Of EXAMINATION & SYLLABUS :INSTRUMENTATION**
Time	**75 Hrs**

Course code	INSTRUMENTATION	
BMLTE20Y305		
Pre-requisite	Nil	Syllabus version

INSTRUMENTATION

1. Simple microscopy
2. Compound microscopy
3. Dark ground microscopy
4. Phase contrast microscopy
5. Fluorescence microscopy
6. Hot air oven
7. Coupling jar
8. Spectrophotometry
9. Haemoglobinometry
10. Haemocytometer
11. Auto analyzer
12. centrifuge
13. Sterilization instrument(Autoclave, Laminar air flow)
14. Egg incubator and dental drill
15. Incubator
16. Urinometer
17. Microtome and accessories
18. Tissue floatation bath
19. Inoclation loop
20. water bath
21. Micro pipettes variable volume.
22. RBC pipette
23. WBC pipette
24. Paper and gel electrophoresis
25. Flame photometer

26. Polarizing microscope
27. Micro-hematocrit centrifuge
28. Gas chromatography
29. Radio immune assay
30. Wintrobe Tube
31. ECG
32. Westergreen Tube
33. Neubar's chamber