

**EKLAVYA**  
UNIVERSITY

ज्ञानप्राप्तये लक्ष्यसन्धानम्

Sagar Road, Damoh (M.P.), Bharat

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**Eklavya University, Damoh (MP)**

**B.M.L.T. II<sup>nd</sup> Year**

**Syllabus 2022-23**

**School of Nursing & Paramedical Science**



School of Nursing and Paramedical  
Sciences

**BACHELOR IN MEDICAL LAB TECHNOLOGY (BMLT)**  
**SCHEME of EXAMINATION: BMLT-2nd Year**

S.No.	Subject Code	Subject	University Examination Theory	Internal Assessment	External Practical	Total
1	BMLTE20Y201	Histology	100	100	100	300
2	BMLTE20Y202	Microbiology-II	100	100	100	300
3	BMLTE20Y203	Biochemistry-II	100	100	100	300
4	BMLTE20Y204	Hematology-II	100	100	100	300
<b>Total Max. Marks</b>						<b>1200</b>

NB.-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.



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Estd. by Madhya Pradesh Niji Mahavidyalaya (Sibopda Avam Sanctional) Arjyaodsh, 2020

School Of Nursing & Paramedical Science

## BACHELOR IN MEDICAL LAB TECHNOLOGY (BMLT)

### SCHEME of EXAMINATION: BMLT-2nd Year

S.No.	Subject Code	Subject	Theory Internal	Internal Assessment	Practical	Total
1	BMLTE20Y201	Histology	100	100	100	300
2	BMLTE20Y202	Microbiology-III	100	100	100	300
3	BMLTE20Y203	Biochemistry-II	100	100	100	300
4	BMLTE20Y204	Hematology-II	100	100	100	300
<b>Total Max. Marks</b>						<b>1200</b>

NB.-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.

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*N. J. M*

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School Of Nursing & Paramedical Science

Department of Paramedical

SYLLABUS

Bachelor of medical laboratory technician (BMLT)

3 YEAR DEGREE COURSE

Year	BMLT 2 <sup>nd</sup> Year
Subject	Histology- II
Time	75 Hours (Theory + Demonstration)

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<b>Course code</b>	<b>Histology - II</b>	
<b>BMLTE20Y201</b>		
<b>Pre-requisite</b>	Nil	
		<b>Syllabus version</b>

**Course Objectives:**

1. To recognize the Histological structure of all body system.
2. To understand all special stain which is used in Histology.
3. To understand different cytological technique like FNAC.
4. To understand perform Grossing, Microtomy.
5. To Understand Microscopy.

**Course Outcome:**

1. Student will be able to understand body tissues, epithelial tissue, connective tissue including bone and cartilage.
2. Student will be able to understand body system(respiratory system, circulatory system, nervous system, digestive system ,reproductive system)
3. Student will be able to understand nerve ending and organ of special senses.
4. 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.
5. Students will be able to working principle, maintenance and application of various types of microscope.

**Student Learning Outcomes (SLO):**

1. Student will be able to understand to how to receive the sample at Reception counter.
2. Student will be able to understand to how to maintain the patient's record register in laboratory.
3. Student will be able to understand to how to label the specimen after sample collection.
4. Student will be able to understand to label the proper manner of specimen before sending in concern department.
5. Student will be able to understand the maintenance of microtome.

**Unit - 1**

Study of various body tissues. Epithelial tissue. Connective tissue including bone and cartilage. Muscular tissue. Nervous tissue. Glands, and endocrine glands.

<b>Unit – 2</b>	<b>15</b>
Histological study of various systems. The circulatory system ,The alimentary system, The digestive system including liver, pancreas and gall bladder, The respiratory system, The Urinary system. The endocrinal gland system, The reproductive system, Nerve ending and organ of special senses.	
<b>Unit – 3</b>	<b>15</b>
Microscopy, working principle, maintenance and application of various types of microscope: Dark ground microscope, Polarizing microscope, Phase contrast microscope Interference microscope , UV Microscope , Micrometry.	
<b>Unit – 4</b>	<b>15</b>
Metachromasis and metachromatic dyes. Haematoxylene its importance in histology, Carbohydrates and amyloid – special stains procedures, Connective tissue, trichome staining and other special stains for the muscular fibres, elastic reticulin and collagen fibres, Principle of metal impregnation techniques, Demonstration and identification of mineral pigments.	
<b>Unit – 5</b>	<b>15</b>
Stain cytologic preparation with special emphasis of MGG, papanicolous Stains Special stains like PAS, mucicarmine alcian blue, schmorl and acid phosphates, Cytologic screening and quality control in cytology laboratory.	
<b>Practical</b>	
<p>1. To study the working principle maintenance and application of various microscope.</p> <p>a) Dark ground microscope</p> <p>b) Polarizing microscope</p> <p>c) Phase contrast microscope</p> <p>2. To do the staining of elastic fibre.</p> <p>3. To do the raticulin staining</p> <p>4. To the staining collazing fibre.</p> <p>5. To do the identification miniral(calcicum)</p> <p>6. To do the identification of pigment.</p> <p>7. To perform the carbohydrate staining procedure.</p>	

- 8. To do the cytological staining by papanicolous
- 9. To do the cytological staining by MCG
- 10. To do the study of various tissue of human body.

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

- 1. Text Book of Medical Laboratory Technology Histology, 5th edition – Praful B. Godkar.
- 2. Text Book of Medical Laboratory Technology 5th edition – RamnikSood.
- 3. Text Book of Histology ,A.K Jain and B.D Chourasia
- 4. Drew Provan, Andrew Krentz. Oxford Handbook of Clinical and Laboratory Investigation 2nd edition. Oxford University Press.

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School Of Nursing & Paramedical Science

Estd. by Madhya Pradesh Nij Vishwavidyalaya (Shiksha Avam Sanchalanat Adhyaksh, 2020)

**Department of Paramedical**

**SYLLABUS**

**Bachelor of medical laboratory technician (BMLT)**

**3 YEAR DEGREE COURSE**

<b>Year</b>	<b>BMLT 2<sup>nd</sup> Year</b>
<b>Subject</b>	<b>Microbiology - II</b>
<b>Time</b>	<b>75 Hrs</b>

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<b>Course code</b>	<b>Microbiology – II</b>	
<b>BMLTE20Y202</b>		
<b>Pre-requisite</b>	Nil	

<b>Course Objectives:</b>	<b>Syllabus version</b>
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1. To have a thorough knowledge and understanding of the core concepts in the discipline of Microbiology.
2. To know about how microorganisms are used as model systems to study basic biology, genetics, Metabolism and ecology.
3. To know about applications of microorganisms in different industries.
4. To understand the nature and details that microorganisms are ubiquitous in nature; inhabiting a multitude of Habitats and occupying a wide range of ecological habitats.
5. To be able to utilize knowledge about vital role of microorganisms in medicine, fermentation, and to human well being.

**Course Outcome:**

1. Students will be able to Learn about Microbiology as a major should have a thorough knowledge and understanding of the core concepts in the discipline of Microbiology..
2. Students will be able to know about how microorganisms are used as model systems to study basic biology, genetics, metabolism and ecology.
3. Students will be able to know about identify ways of microorganisms play an integral role in disease, and microbial and immunological methodologies are used in disease treatment and prevention.
4. Students will be able to know detail about microorganisms is ubiquitous in nature inhabiting a multitude of habitats and occupying a wide range of ecological habitats.

**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 pre-hospital 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 pre hospital setting.

**Unit – 1** **15**

IDENTIFICATION OF BACTERIA:- Micrococci, Staphylococci, Streptococci, Pneumococci, Corynebacteria. Escherichia, Klebsiella, Enterobacter, Proteus providencia, Salmonella, Shigella. Arizona, Citrobacter, Yersinia, Pseudomonas.

**Unit – 2** **15**

Vibrio, Haemophilus, Brucella, Bordetella, Bacillus, Clostridia, Anaerobic cocci, Neisseria, Treponema, Borrelia, Leptospira, Mycoplasma, Rickettsia, Chlamydia, TRIC agent.

**Unit – 3** **15**

PATHOGENIC AND NON-PATHOGENIC FUNGI:- Candida, Cryptococci, Dermatophytes, Sporotrichosis, Histoplasma, Blastomyces, Coccidioides, Para coccidioides, Dermatiaceous fungi, Mycetoma, Actinomyces, Nocardia, Common laboratory contaminants. Biochemical test used for the identification of bacteria and fungi, Antimicrobial sensitivity testing, Assay methods for body fluids, Antimicrobial susceptibility testing for mycobacterium, Preparation and standardization of antigen and antisera.

**Unit – 4** **15**

VIROLOGY:-Different staining technique used in virology, Used of embryonated eggs in clinical virology Principles of animal cell culture and their use in virology, Use of common laboratory animals in viral culture.

**Unit – 5** **15**

PARASITOLOGY:-Morphology and life cycle of haemoflagellates Leishmania and Trypanosoma. Morphology and life cycle of tissue and blood nematodes : Filaria, Trichinella and Dracunculus, Laboratory diagnosis of tissue and blood nematodes infection Taenia, Echinococcus, Morphology and life cycle of intestinal cestodes :- H.nana, D. Latum, Laboratory diagnosis of cestode infection hydatid, cysticercosis. Culture techniques for protozoa:- amoeba, giardia, leishmania. Culture method for helminth's hookworm, roundworm, Egg counting techniques, Putting up cason's test and its interpretation. Examination and processing of cysticercosis cyst, Laboratory processing, staining and examination of sample.

**Practical**

1. Identification of deferential catilase producing bacteria.

2. Identification of Entrobacteria.
3. Coagulase Test.
4. Indole Test.
5. Nitrate Production Test.
6. Gelatin Test.
7. Oxidase Test.
8. Urease Test.
9. Voges proskauer Test.
10. Study of gram negative bacillus E.coli
11. Study of gram positive cocci.
12. Aspergillus
13. Mucor
14. Rhizopus
15. Demonstration of technique for pure culture micro organization
16. To study stain bacteria in culture by gram staining method.

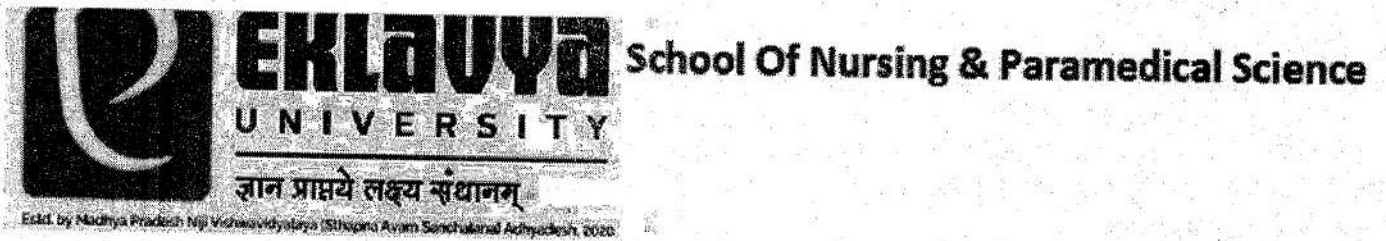
# Mode: Flipped Class Room, Case Discussion, Lectures.

**Suggested Reading:**

Anand Narayan and Panikar, Textbook of Microbiology

Baweja, Medical Microbiology

Arora, Medical Lab Technology, Karykartee and Damle, Textbook of Parasitology



Department of Paramedical

SYLLABUS

Bachelor of medical laboratory technician (BMLT)

3 YEAR DEGREE COURSE

Year	BMLT 2 <sup>nd</sup> Year
Subject	Biochemistry - II
Time	75 Hrs

*Dr. N. T. N.*

<b>Course code</b>	<b>Biochemistry - II</b>	
<b>BMLTE20Y203</b>		
<b>Pre-requisite</b>	Nil	
		<b>Syllabus version</b>
<b>Course Objectives:</b>		
1. To know various biochemical processes occurring inside human body at cellular and molecular level.		
2. To know about the mechanism, requirement and factors affecting the biochemical processes at all levels.		
3. To understand the outcome of different biochemical processes.		
4. To understand the affects of various biochemical processes on human body.		
5. To understand and practice various methods of analysing various biochemical contents in samples.		
<b>Course Outcome:</b>		
1. Students will be able to operate instruments and will be able to perform biochemistry test in laboratory.		
2. Students will learn to prepare reagents, solutions and will be able to diagnose diseases in biological samples through biochemistry tests..		
3. Demonstrate an increased depth and breadth of patient care in the pre hospital setting by applying principles from evidence-based research in emergency medicine.		
<b>Student Learning Outcomes (SLO):</b>		
1. Students will be able to demonstrate their ability to perform an appropriate primary/initial assessment of the ill or injured patient in the pre hospital 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 pre hospital setting.		
<b>Unit - 1</b>		<b>15</b>
ANALYTICAL BIOCHEMISTRY AND METABOLISM: Colorimeter, Spectrophotometer, Flame photometry.		



<b>Unit – 2</b>	<b>15</b>
Atomic absorption spectroscopy: Electrometric determination of Na + and K -. Chromatography and electrophoresis.	
<b>Unit – 3</b>	<b>15</b>
Introduction, properties and simple metabolism of carbohydrates, protein, fats, nucleic acid and enzymes.	
<b>Unit – 4</b>	<b>15</b>
Digestion and absorption Nutrition (vitamin and calories).	
<b>Unit – 5</b>	<b>15</b>
Radioimmunoassay (RIA) and ELISA .	
<b>Practical</b>	
<ol style="list-style-type: none"> <li>1. To study colorimeter</li> <li>2. To study spectrophotometer</li> <li>3. To study centrifuge machine</li> <li>4. To study carbohydrates <ol style="list-style-type: none"> <li>a) barfoed Test</li> <li>b) mohlish Test</li> <li>c) benedict Test</li> <li>d) iodine Test</li> </ol> </li> <li>5. To study of protein. <ol style="list-style-type: none"> <li>a) Biurate Test</li> <li>b) zanthoprotiem Test</li> <li>c) ninhydrin Test</li> </ol> </li> <li>6. separation of amino acid by paper chromatography.</li> <li>7. separation of plasma protein by electrophoresis.</li> </ol>	
<b># Mode: Flipped Class Room, Case Discussion, Lectures.</b>	
<ol style="list-style-type: none"> <li>1. Textbook of Medical Lab Technology - Praful B. Godkar and Darshan B. Godkar Text Book of Biochemistry for Medical Students 5th edition – DM Vasudevan.</li> <li>2. Text Book of Medical Biochemistry 3rd edition. Dinesh Puri.</li> <li>3. Manual of Laboratory &amp; Diagnostic Tests – Mcgraw Hill.</li> <li>4. Drew Provan, Andrew Krentz. Oxford Handbook of Clinical and Laboratory Investigation 2nd edition. Oxford University Press.</li> </ol>	



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Estd. by Madhya Pradesh Niji Vishwavidyalaya (Sheepokh Avam) Surachalera, Achhmadesh, 2020

School Of Nursing & Paramedical Science

Department of Paramedical

SYLLABUS

Bachelor of medical laboratory technician (BMLT)

3 YEAR DEGREE COURSE

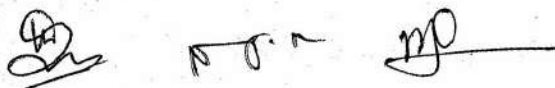
Year	BMLT 2 <sup>nd</sup> Year
Subject	Hematology - II
Time	75 Hrs

## Hematology – II

Course code	Hematology – II	
BMLTE20Y204		
Pre-requisite	Nil	Syllabus version
<b>Course Objectives:</b>		
<ol style="list-style-type: none"> <li>1. To know and understand every disease etiology and management</li> <li>2. To understand pathogenesis and ways to find out the cues of the diseases.</li> <li>3. To understand symptoms and effects of various diseases</li> <li>4. To know the requirements, methods of analysis and differentiation of various samples in relation to pathology</li> </ol>		
<b>Course Outcome:</b>		
<ol style="list-style-type: none"> <li>1. Students will be able acquire knowledge on the blood group ABO &amp; Rh system</li> <li>2. Students will be able to acquire knowledge on the labeling of blood bags ,blood grouping, donation and other processes used in blood bank.</li> <li>3. Students will be able to acquire knowledge about pathology lab procedures.</li> <li>4. Students will be able to have proper understanding of procedures carried out in lab</li> <li>5. Students will be able to work in different labs independently.</li> </ol>		
<b>Student Learning Outcomes (SLO):</b>		
<ol style="list-style-type: none"> <li>1. Student will able to be conversant with synthesis and degradation of hemoglobin.</li> <li>2 Student will able be proficient with abnormal hemoglobin and their identification.</li> <li>3. Students will be able to prepare and stain blood film.</li> <li>4. Students will get acquainted with mechanism of hemostasis</li> </ol>		
<b>Unit – 1</b>		<b>15</b>
History and discovery of blood group, ABO and Rhesus blood group system, Compatibility test in blood transfusion, complication and hazards of blood transfusion.		
<b>Unit – 2</b>		<b>15</b>
Laboratory investigation of transfusion reaction and mismatched transfusion. Preparation of packed cells and various fractions of blood for transfusion purpose, Staining of bone marrow smear and preparation of histological section		



<b>Unit – 3</b>	<b>15</b>
Haemoglobin its synthesis function and degradation, Haemoglobin pigments and their measurements, Abnormal haemoglobin and their means of identification and estimation.	
<b>Unit – 4</b>	<b>15</b>
LE cells phenomenon and various method of its demonstration, Haemostatic mechanism and theories of blood coagulation.	
<b>Unit – 5</b>	<b>15</b>
Screening coagulation procedure, Quantitative assay of coagulation factors.	
<b># Mode: Flipped Class Room, Case Discussion, Lectures.</b>	
1. Textbook of Medical Laboratory Technology (Set of 2 Volumes): Clinical Laboratory Science and	
2. Molecular Diagnosis (English) 3rd Edition (Hardcover)	
3. Textbook of Medical Laboratory Technology (Set of 2 Volumes)	
<b>Practical</b>	
<ol style="list-style-type: none"> <li>1. Study of ABO grouping with antisera</li> <li>2. Cross machining demonstration and instruction</li> <li>3. Determination of pro-thrombin time Dukes methods</li> <li>4. Determination of RH group by slide method</li> <li>5. Study of bone marrow staining</li> <li>6. Coomb's Test (a) direct coomb's test (b) indirect coomb's test</li> <li>7. Study of lupus erythematosus (LE) cell.</li> <li>8. determination of Glucose 6 phasphate dehydrogenase (G-6pd)</li> </ol>	
<b>PRACTICAL REFERENCE</b>	
<ol style="list-style-type: none"> <li>1. Practical book Dacie &amp; Lewis, Practical Hematology</li> <li>2. Ramanik Sood, Laboratory Technology Methods and Interpretation</li> <li>3. S.K Jain practical book, pathology</li> <li>4. S.S Rao, practical Pathology, Laboratory Technology</li> </ol>	





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## BACHELOR IN MEDICAL LAB TECHNOLOGY (BMLT)

### SCHEME Of EXAMINATION: BMLT-3rd Year

S.No.	Subject Code	Subject	Theory Internal	Internal Assessment	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
5	BMLTE20Y305	Instrumentation		50		50
<b>Total Max. Marks</b>						<b>1250</b>

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.