

**DEEN DAYAL UPADHYAY KAUSHAL KENDRA**

**MAHISHADAL RAJ COLLEGE**

**BVoc in Medical Laboratory Technology**

<b>PO</b>	<b>Summary</b>	<b>Description</b>
<b>PO1</b>	<b>Specialized Knowledge of the Discipline</b>	BVoc in MLT is one of the most sought after courses in India. This is mainly because the course helps individuals in possessing extensive knowledge of laboratory techniques and methods.
<b>PO2</b>	<b>Human Anatomy and Physiology</b>	Through this subject, students learn the basic principles of human anatomy and physiology. This empowers the students with a brief understanding of the human body and its parts. The laboratory techniques taught to relieve pain and treat the human body are also demonstrated. Some parts of the syllabus are: Histology Embryology Nemo Anatomy Genetics Physical Anthropology Applied Anatomy Advances in Anatomy
<b>PO3</b>	<b>Microbiology</b>	The syllabus of this subject delves into the microscopic world of microbes and how they interact with the environment. The objective of this subject is to provide the basic knowledge of microbiological sciences and study its applications
<b>PO4</b>	<b>Biochemistry</b>	This subject helps in understanding many processes in plants and animals. It helps in drug discovery as well. Students are introduced to the basic concepts of Biochemistry and metabolism in plants and animals. Some parts of the syllabus are: Structure and function of biomolecules Basic concept and design of metabolism Nitrogen fixation Integration of metabolisms

<b>P05</b>	<b>Histopathology</b>	This will introduce you to how various bodily tissues are affected by diseases. One can form a deeper understanding of how to provide first aid and extensive treatments for different diseases and convenient ways to repair damaged tissues.
<b>P06</b>	<b>Virology</b>	Students learn about the structure, mode of nutrition and replication of viruses. This provides an understanding of how various viral diseases start and progress to become major illnesses.
<b>P07</b>	<b>Toxicology</b>	The subject introduces students to poisons and toxic substances and provides them with an understanding of how these toxins affect the body.

<b>Program Specific Outcomes Nos</b>	<b>Program Specific Outcomes (PSO)</b>
<b>PSO1</b>	Medical Laboratory Technologist/Technician Perform laboratory tests, analyse results, and assist in disease diagnosis and treatment in hospitals, clinics, and diagnostic laboratories.
<b>PSO2</b>	Research Associate Conduct research in medical laboratories or pharmaceutical companies to develop new diagnostic tests, drugs, or medical devices.
<b>PSO3</b>	Quality Control Technician Maintain quality control standards, perform routine equipment maintenance, and ensure the accuracy of laboratory tests.
<b>PSO4</b>	Blood Bank Technician Manage blood donation, process blood samples, and ensure the safe storage and distribution of blood products for transfusions.
<b>PSO5</b>	<b>Microbiologist Study microorganisms, identify pathogens, and research infectious diseases.</b>
<b>PSO6</b>	<b>Clinical Data Analyst Analyses clinical data and laboratory results to identify trends, patterns, and correlations for medical decision-making and healthcare policies.</b>
<b>PSO7</b>	<b>Educator/Trainer Teach in academic institutions or training programs to educate future medical laboratory professionals and keep current practitioners updated on advances in the field.</b>
<b>PSO8</b>	<b>Entrepreneur Start a laboratory or healthcare-related business, such as a diagnostic center, telemedicine platform, or medical equipment supply company</b>

PAPERNAME	COURSE	COURSEOUTCOME
<p align="center"><b>Semester I</b></p> <p><b>Introduction to medical laboratory technology</b></p> <p><b>C1T: BMLT101</b> General Human Anatomy, &amp; Physiology -I</p>	<p align="center"><b>C01</b></p>	<p><b>Each student will have a clear idea of</b></p> <p><b>COI- Basics of Human Anatomy-I</b></p> <p align="center"><b>Basics of Physiology-I</b></p> <p><b>Study of the structure and relationship between body parts ,Examination of how the body functions.</b></p>
<p><b>CT2: BMLT102</b> (Routine Laboratory Techniques-I)</p>	<p align="center"><b>C02</b></p>	<p><b>After the completion of this course students will be able to know</b></p> <p><b>CO2-Human Healthcare and Safety Regulations</b></p> <p><b>CO2-Introduction to Haematology and Routine tests</b></p> <p><b>CO2-Specimen Collection</b></p> <p><b>CO2- Laboratory Preparation in Hematology</b></p>
<p><b>CT3;SpecialLaboratory Techniques</b></p>	<p align="center"><b>C03</b></p>	<p><b>CO3-Biochemical Test Profile -I</b></p> <p><b>CO3-Biochemical Test Profile - II</b></p> <p><b>CO3-Elementary Knowledge of Chemistry- I</b></p> <p><b>CO3-Elementary Knowledge of Chemistry- II</b></p>

<p align="center"><b>CT4- Cell Biology and Biodiversity-I</b></p>	<p align="center">C04</p>	<p align="center">C04.1:Microscopy and Organization of Cell. C04.2:Microscopy and Organization of Cell  Systematic study of Animal C04.3: Systematic study of Animals</p>
<p align="center"><b>C5T: Biomolecules</b></p>	<p align="center">C05</p>	<p align="center">C05.1: This course will give students an understanding Structure, Functions and Classification of Amino Acids and Proteins. C05.2:Structure, Functions and Classification of Carbohydrates C05.3:Structure, Functions and Classification of Lipids  C05.4: Physical and Chemical Properties of Nucleic Acids</p>
<p align="center"><b>C6T: Fundamentals of Microbiology</b></p>	<p align="center">C06</p>	<p align="center">C06.1:This course will enable the students to Study about Microbiology C06.2: Morphology and Structure of Microorganisms.  C06.3: Recombinant DNA Technology  Microbial Ecology and Biotic Interactions</p>

<p><b>C7T:</b> General &amp; Human Anatomy , Physiology</p>	<p><b>C07</b></p>	<p>C07.2: Through this subject, students learn the basic principles of human anatomy and physiology. This empowers the students with a brief understanding of the human body and its parts. The laboratory techniques taught to relieve pain and treat the human body are also demonstrated.</p> <p>Some parts of the syllabus are:</p> <ul style="list-style-type: none"> <li>Histology</li> <li>Embryology</li> <li>Nemo Anatomy</li> <li>Genetics</li> <li>Physical Anthropology</li> <li>Applied Anatomy</li> <li>Advances in Anatomy</li> </ul>
<p><b>C8T:</b> Biochemistry</p>	<p><b>C08</b></p>	<p>C08.1: This subject helps in understanding many processes in plants and animals. It helps in drug discovery as well. Students are introduced to the basic concepts of Biochemistry and metabolism in plants and animals</p> <p>Some parts of the syllabus are:</p> <ul style="list-style-type: none"> <li>• Structure and function of biomolecules</li> <li>• Basic concept and design of metabolism</li> <li>• Nitrogen fixation</li> <li>• Integration of metabolisms</li> </ul>
<p><b>C9T:</b> Histopathology</p>	<p><b>C09</b></p>	<p>C09: This will introduce you to how various bodily tissues are affected by diseases. One can form a deeper understanding of how to provide first aid and extensive treatments for different diseases and convenient ways to repair damaged tissues.</p>

<b>C10T: Virology</b>	<b>C010</b>	CO10.2: Students learn about the structure, mode of nutrition and replication of viruses. This provides an understanding of how various viral diseases start and progress to become major illnesses
<b>C11T: Toxicology</b>	<b>C011</b>	CO11.1: The subject introduces students to poisons and toxic substances and provides them with an understanding of how these toxins affect the body.
<b>C12T: General Pathology</b>	<b>C012</b>	CO12.1: Students are introduced to the concepts of Necrosis, Hyperplasia, Hypertrophy, and Atrophy. Besides, they are introduced to inflammation and Neoplasia. Hemodynamics and the process of correlation with laboratory diagnosis are taught as well
<b>C13T: Clinical Pathology &amp; Hematology</b>	<b>C013</b>	CO13.1: Students are briefly introduced to the concepts of haematopoiesis and related illnesses like Anaemia. Normal and abnormal Hb with special reference to Thalassemia is discussed and causes of leukocytosis and leukopenia along with WBC production is looked upon. Platelets, anticoagulants and bone marrow are studied in more detail. It teaches the students the process to select the correct repertory and how to use it as a tool for making effective and correct conclusions. By using the practices effectively, students will be able to better diagnose clinical cases of complex diseases and would possess an in-depth understanding of medical cases. They will also be able to practically apply the techniques.
<b>C14T: General and Systematic Bacteriology</b>	<b>C014</b>	<b>CO14.1:</b> History of Microbiology is taught and students are introduced to Microbial Cells, Nutrition, Growth and control of Microorganisms. They learn about Bacterial Genetics and systematic bacteriology. Waste disposal is also researched

<b>C10T:</b> Biochemistry	<b>C010</b>	<b>C010.2:</b> Knowledge of general chemistry and lab organisation along with common laboratory hazards is studied while various laboratory equipment are introduced. Metabolism of various nutrients is taught along with Ketogenic metabolism. Enzymology and roles of vitamins and fats is studied..
<b>C11T:</b> Routine Laboratory Techniques-II	<b>C011</b>	C011.1: Routine Haematological Tests .  C011.2: Urine Examination Stool Examination Sputum and Semen Examination
<b>C12T:</b> Special Laboratory Techniques	<b>C012</b>	C012.1: Basic Microbiology Introduction to serology  C012.2: Serological Tests Staining Techniques
<b>C13T:</b> Ecology and Biodiversity	<b>C013</b>	C013.1: Systematic study of Animals - III Systematic study of Animals - IV  C013.3: Ecosystem-I Ecosystem-II
<b>C14T:</b> Enzymology and Bioenergetics	<b>C014</b>	<b>C014.1:</b> Enzymes Enzyme Purification and Chromatography Enzyme Kinetics Bioenergetics



C15 T: Advanced Clinical Biochemistry	C014	Detailed study of biochemical alterations in diseases.
C16: Lab Management and Ethics	C016	Management principles and ethical practices in the lab
C17: Medical Biotechnology	C017	Application of biotechnology in medicine.
C18: Practical Lab Work V	C018	Highest level of practical laboratory training.
C19: Research Methodology	C019	Principles and practices of conducting scientific research

#### DISCIPLINE SPECIFIC ELECTIVE (DSE)

SEMESTER V	C015	Students gain knowledge in a variety of BMLT subjects and topics, including Hematology, Clinical Biochemistry, Microbiology, Immunology, and Transfusion Medicine. They also acquire critical abilities like Quality Assurance, Management, and Research Methodology in the Laboratory.
DSE 2T:	C016	CO16.1: STUDENTS CAN ALSO STUDY WITH SAID SUBJECT. Nuclear Medicine Technology Medical Technology Medical Lab Technology
Semester VI DSE3T:	C017	CO17.1: STUDENTS CAN START WITH- Medical Laboratory Technologist/Technician Perform laboratory tests, analyse results, and assist in disease diagnosis and treatment in hospitals, clinics, and diagnostic laboratories.

## **SKILL ENHANCEMENT COURSE (SEC)**

**Enhancement Compulsory Course :Environment Science and Health Credits: 04 Course content: 1. Basic idea about environment, Relation between environment and health. 2. Water pollution-Water related diseases (biological and chemical), water pollution law, purification of water (large scale and small scale), water quality criteria and standards, surveillance of drinking water quality, controlling measures of water pollution. 3. Air pollution- Sources of air pollutants, types, Health hazards by air pollutants, ventilation and its standards, controlling measures of air pollution, air stress indices- heat stress, cold stress, global warming, humidity. 4. Solid waste disposal system- Methods of disposal, modern sewage treatment- primary and secondary treatment. 5. Hospital waste management- Generation of hospital waste, health hazards of hospital wastes, disposal and treatment of hospital wastes, bio-medical wastes.**

## **COURSE OUTCOME (CO)**

**Medical laboratory science is an umbrella field comprising a number of different disciplines. The major role of medical laboratory is to assist in the diagnosis and treatment of disease by performing qualitative quantitative or screening test procedures or examination on materials derived from the human body. A medical laboratory technologist is a health care professional who performs chemical, haematological, immunological, histopathological, cytopathological, microscopic and bacteriological diagnostic analyses on body fluids as well as other specimens. The syllabus covered all the important area of laboratory sciences to increase their analytical skills, quality control, and advanced knowledge so that they will work in clinical laboratories at hospitals, reference labs, bio technology labs and non clinical industrial labs. Students will know and comprehend the significant theories, models, themes, and ideas in the biomechanical, physiological, behavioural, biological, socioeconomic, environmental, and socio-cultural aspects and Community Health**