

**DR. BABASAHEB AMBEDKAR MARATHWADA UNIVERSITY,
CHHATRAPATI SAMBHAJINAGAR.**



CIRCULAR NO.SU/Sci & Tech./Diploma/54/2024.

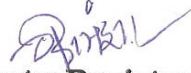
It is hereby inform to all concerned that, on the recommendation of The Dean of Faculty of Science & Technology; the Academic Council at its meeting held on 05.06.2024 has accepted the **“One Year Diploma in Medical Laboratory Technician”** University Campus Under the faculty of Science & Technology.

This is effective from the Academic Year 2024-25 onwards as per appended herewith.

All concerned are requested to note the contents of the circular and bring notice to the students, teachers and staff for their information and necessary action.

University campus,
Chhatrapati Sambhajanagar-431 004.
Ref. No.SU/Dip./syllabus./2024-25/9950-8
Date: 27.10.2024

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**Deputy Registrar,
Academic Section.
(Syllabus)**

Copy forwarded with compliments to :-

- 1] **The Director, Entrepreneurship and Skill Development Centre, Dr.Babasaheb Ambedkar Marathwada University.**
- 2] **The Director, University Network & Information Centre, UNIC, with a request to upload the curriculum along with this Circular on University Website.**

Copy to :-

- 1] **The Director, Board of Examinations & Evaluation, Dr.Babasaheb Ambedkar Marathwada University, Chhatrapati Sambhajanagar.**
- 2] **The Section Officer, [B.Voc Unit] Examination Branch, Dr.Babasaheb Ambedkar Marathwada University, Chhatrapati Sambhajanagar.**
- 3] **The Programmer, [Computer Unit-1] Examination Branch, Dr.Babasaheb Ambedkar Marathwada University, Chhatrapati Sambhajanagar.**
- 4] **The Programmer, [Computer Unit-2] Examination Branch, Dr.Babasaheb Ambedkar Marathwada University, Chhatrapati Sambhajanagar.**
- 5] **The In-charge, [E-Suvidha Kendra], Rajarshi Shahu Maharaj Pariksha Bhavan, Dr.Babasaheb Ambedkar Marathwada University, Chhatrapati Sambhajanagar.**
- 6] **The Public Relation Officer, Dr.Babasaheb Ambedkar Marathwada University, Chhatrapati Sambhajanagar.**
- 7] **The Record Keeper, Dr.Babasaheb Ambedkar Marathwada University, Chhatrapati Sambhajanagar.**

Dr. Babasaheb Ambedkar Marathwada University

Chhatrapati Sambhajnagar- 431001



Entrepreneurship and Skill Development Centre

One Year

'Diploma in Medical Laboratory Technician'

Course Structure

(Based on NEP -2020)

Effective from 2024-25

PREFACE

Medical laboratory technicians (MLTs) are crucial in India's healthcare system, performing essential diagnostic tests, supporting physicians, enhancing public health, ensuring technological proficiency, maintaining quality control, providing education and training, contributing to cost-effective healthcare, and aiding in research and development. Their work is essential for accurate diagnostics, assisting physicians, enhancing public health, and bridging the gap between clinical evaluation and laboratory findings. MLTs also contribute to early detection and management of infectious diseases, enabling prompt intervention and control measures. Their technological proficiency ensures efficient use of laboratory equipment and software, leading to better diagnostic outcomes. Quality control in laboratories ensures standardized conditions, reducing errors and inconsistencies. MLTs also contribute to education and training, building a competent workforce to meet the growing needs of the healthcare sector. Their involvement in medical research drives innovation in medical science, advancing healthcare and finding new solutions to medical challenges.

Importance of Medical Lab Technicians can be highlighted through several key aspects:

1. Diagnostic Accuracy

MLTs perform essential laboratory tests that are crucial for diagnosing diseases. They analyze samples of blood, urine, and other bodily fluids to detect abnormalities, infections, and other medical conditions. Accurate diagnostics are foundational for effective treatment and patient care, making MLTs indispensable in ensuring precise and timely test results.

2. Support for Physicians

Physicians rely heavily on the data and results provided by MLTs to make informed decisions about patient care. This collaboration is vital for developing appropriate treatment plans and monitoring the progress of diseases. MLTs help bridge the gap between clinical evaluation and laboratory findings, thus enhancing the overall quality of healthcare services.

3. Public Health Monitoring

MLTs contribute significantly to public health initiatives by identifying and tracking outbreaks of infectious diseases. Their work in laboratories helps in the early detection and management

of public health threats, enabling prompt intervention and control measures. This is particularly important in a populous country like India, where the spread of infectious diseases can have widespread implications.

4. Technological Proficiency

As healthcare technology advances, MLTs are trained to operate sophisticated laboratory equipment and software. Their expertise ensures the efficient and accurate functioning of these technologies, leading to better diagnostic outcomes. The ability to adapt to and manage new diagnostic tools and procedures is crucial in maintaining high standards of healthcare.

5. Quality Control

MLTs are responsible for maintaining quality control in laboratories. They ensure that all tests are conducted under standardized conditions, reducing the risk of errors and inconsistencies. This commitment to quality enhances the reliability of laboratory results and builds trust in healthcare services.

6. Education and Training

In India, the demand for skilled MLTs is rising due to the expansion of healthcare services. MLTs contribute to the education and training of new technicians, helping to build a competent workforce that can meet the growing needs of the healthcare sector. Their role in mentoring and training ensures a continuous supply of qualified professionals in the field.

7. Cost-Effective Healthcare

By providing accurate and efficient diagnostic services, MLTs help reduce the overall cost of healthcare. Early and accurate diagnosis can prevent the progression of diseases, leading to less intensive and less expensive treatments. This cost-effectiveness is crucial in a country like India, where healthcare resources are often limited and need to be managed efficiently.

8. Research and Development

MLTs often participate in medical research, contributing to the development of new diagnostic tests and treatments. Their hands-on experience with laboratory procedures and patient samples provides valuable insights that drive innovation in medical science. This

research is essential for advancing healthcare and finding new solutions to medical challenges.

In summary, medical lab technicians are vital to India's healthcare system. Their work supports accurate diagnostics, assists physicians, enhances public health, ensures technological proficiency, maintains quality control, provides education and training, contributes to cost-effective healthcare, and aids in research and development. The importance of MLTs cannot be overstated, as they are essential for the effective functioning and advancement of medical services in India.

**Structure of
One Year
Diploma in Medical Laboratory Technician**

DMLT First Year: 1st Semester

Course Type	Course Code	Course Name	Teaching Scheme (Hrs / Week)		Credits Assigned		Total Credits	Total Marks
			Theory	Lab Course	Theory	Lab Course		
DMLT Theory - 1	DMLTT101	Basics of Anatomy	04	00	04	00	04	100
DMLT Theory - 2	DMLTT102	Basics of Physiology	04	00	04	00	04	100
DMLT Theory - 3	DMLTT103	Basics of Biochemistry	04	00	04	00	04	100
DMLT Theory - 4	DMLTT104	Basics of Pathology	04	00	04	00	04	100
DMLT Theory - 5	DMLTT105	Patient Safety and Infection Control	04	00	04	00	04	100
			20	00	20	00	20	500

DMLT First Year: 2nd Semester

Course Type	Course Code	Course Name	Teaching Scheme (Hrs / Week)		Credits Assigned		Total Credits	Total Marks
			Theory	Lab Course/OJT	Theory	Lab Course		
DMLT Theory - 6	DMLTT201	Hematology and Clinical Pathology	02	00	02	00	02	50
DMLT Theory - 7	DMLTT202	Immunology and Serology	02	00	02	00	02	50
DMLT Theory - 8	DMLTT203	Introduction Of Histopathology, Cytology and Microbiology	02	00	02	00	02	50
Theory Courses to be covered within First Two Operative Months of the Semester								
DMLT OJT - 1	DMLTT211	On-the-Job Training (4 Months)	00	28	00	14	14	400
			06	28	06	14	20	550

Eligibility:

XII Science/Commerce/Arts or equivalent from any recognized Board/Institution are eligible for registration/ admission to first year (Semester I) of DMLT program.

Credit-to-contact hour Mapping:

- (a) One Credit would mean equivalent of 15 contact hours for theory lecture.
- (b) For lab course/ workshops/internship/field work/project, the credit weightage for equivalent hours shall be 50% that for lectures.

Attendance:

Students must have 75 % of attendance in each course for appearing examination otherwise he / she will not be strictly allowed for appearing the examination of each course. Frequent absence from regular theory/Laboratory course may lead to disqualification from end semester examination.

Departmental Committee:

The Departmental Committee (DC) of the Centre will monitor smooth functioning of the program.

Results Grievances / Redressal Committee

Grievances / Redressal committee should be constituted in the department to resolve all grievances relating to the evaluation. The committee shall consist of Head of the department, the concerned teacher of a particular course and senior faculty member of Department of Committee. The decision of Grievances / redressal committee will have to be approved by Department committee.

Evaluation Methods:

Evaluation of Theory Courses:

4 Credit Courses:

There will be Theory Examination of 100 Marks for each theory course of 4 credits. Question paper will comprise of 50 MCQ questions of 02 marks each from respective courses.

2 Credit Courses:

There will be Theory Examination of 50 Marks for each theory course of 2 credits. Question paper will comprise of 25 MCQ questions of 02 marks each from respective courses.

There will be 40 % passing criteria for theory examination.

Evaluation of On-the-job training:

Semester- End evaluation will be conducted based on routine performance of the candidate. Following evaluation pattern will be followed:

Viva: 150 Marks, Case Studies: 130 Marks, Journal/Log Book: 120 marks

There will be 40% passing criteria for On-the-job training.

Earning Credits:

At the end of every semester, a letter grade will be awarded in each course for which a student had registered. A student's performance will be measured by the number of credits that he/she earned by the weighted Grade Point Average (GPA). The SGPA (Semester Grade Point Average) will be awarded after completion of respective semester and the CGPA (Cumulative Grade Point Average) will be awarded at the respective exit point.

Grading System:

The grading reflects a student-own proficiency in the course. A ten-point rating scale shall be used for the evaluation of the performance of the students to provide letter grade for each course and overall grade for the Bachelor Programme. Grade points are based on the total number of marks obtained by him / her in all heads of the examination of the course. The grade points and their equivalent range of marks are shown in Table-I

Table – I: Ten point grade and grade description

Marks Obtained (%)	Grade Point (GPA/CGPA)	Letter Grade	Description
90-100	9.00- 10	O	Outstanding
80-89	8.00-8.99	A ⁺	Excellent
70-79	7.00-7.99	A	Very Good
60-69	6.00-6.99	B ⁺	Good
55-59	5.50-5.99	B	Above Average
50-54	5.00-5.49	C	Average
40-49	4.00-4.99	P	Pass
Below 40	Below 4.0	F	Fail
Absent	Absent	Ab	Absent

- Non-appearance in any examination / assessment shall be treated as the students have secured zero marks in that subject examination / assessment.

- Minimum P grade (4.00 grade points) shall be the limit to clear / pass the **course / subject**. **A student with F grade will be considered as —failed in the** concerned course and he / she has to clear the course by appearing in the next successive semester examinations. There will be no revaluation or recounting under this system.
- Every student shall be awarded grade points out of maximum 10 points in each subject (based on 10 point scale). Based on the grade points obtained in each subject, Semester
- Grade Point Average (SGPA) and then Cumulative Grade Point Average (CGPA) shall be computed. Results will be announced at the end of each semester and CGPA will be given at respective exit point.

Computation of SGPA (Semester Grade Point Average) and CGPA (Cumulative Grade Point Average)

Grade in each subject / course will be calculated based on the summation of marks obtained in all five modules.

The computation of SGPA and CGPA will be as below

- Semester Grade Point Average (SGPA) is the weighted average points obtained by the students in a semester and will be computed as follows:

Sum (Course Credits) X Number of Grade Points in concerned Course
Gained by the Student

SGPA = -----

Sum (Course Credits)

- The SGPA will be mentioned on the grade card at the end of every semester.
- The Cumulative Grade Point Average (CGPA) will be used to describe the overall performance of a student in all semester of the course and will be computed as under.

Sum (Two Semester SGPA)

CGPA = -----

Total Number of Semester

- The SGPA and CGPA shall be rounded off to the second place of decimal.

Grade Card

Results will be declared by the Centre and the grade card (containing the grades obtained by the student along with SGPA) will be issued by the university after completion of every semester. The grade card will be consisting of following details.

- Title of the courses along with code opted by the student. Credits associated with the course.
- Grades and grade points secured by the student.
- Total credits earned by the student in a particular semester. Total credits earned by the students till that semester.
- SGPA of the student.
- CGPA of the student (at respective exit point).

Cumulative Grade Card

The grade card showing details grades secured by the student in each subject in all semesters along with overall CGPA will be issued by the University at respective exit point.

First Semester Syllabus

DMLTT101: Basics of Anatomy
(04 Credits – 60 Contact Hrs.)

Learning Outcomes:

After Completion of this course, students should be able to:

1. Describe the structure and function of major human organ systems, demonstrating an understanding of how these systems interrelate to maintain homeostasis.
2. Apply their knowledge of human anatomy to identify appropriate specimen collection sites and analyze anatomical factors that affect laboratory testing procedures.

1. Basic Concepts

- 1.1 Human body as whole
- 1.2 Glands and cavities
- 1.3 Organs and organ System

2. Cell and Tissue Anatomy

- 2.1 Cell structure in detail
- 2.2 Identification of cell components
- 2.3 Tissue
- 2.4 Types of tissue+B349
- 2.5 Identification of tissues

3. Cardiovascular System

- 3.1 Heart
- 3.2 Aorta and major blood vessels
- 3.3 Blood

4. Respiratory System

- 4.1 Upper respiratory tract
- 4.2 Lower respiratory tract

5. Digestive System

- 5.1 Digestive tract
- 5.2 Digestive accessory glands

6. Skeletal System

- 6.1 Axial skeleton
- 6.2 Appendicular skeleton

7. Muscular System

- 7.1 Types of muscles

8. Excretory System

- 8.1 Kidney and ureter
- 8.2 Urinary bladder and urethra

9. Nervous system

9.1 Central nervous system

9.2 Peripheral nervous system

10. Endocrine glands

11. Sensory Organs

DMLTT102: Basics of Physiology
(04 Credits – 60 Contact Hrs.)

Learning Outcomes:

After Completion of this course, students should be able to:

1. Explain the physiological functions of key organ systems, such as the cardiovascular, respiratory, and endocrine systems, and their role in maintaining homeostasis.
2. Apply their understanding of physiological processes to interpret abnormalities in laboratory test results, aiding in the identification of potential health disorders.

1. General Physiology

1.1 Homeostasis

1.2 Cell transport mechanism

2. Cell and Tissues Physiology

2.1 Cell reproduction

2.2 Transport process of cell

2.3 Types of tissue and their functions

3. Cardiovascular System

3.1 Heart circulation

3.2 Blood pressure

3.3 Heart cardiac impulse, Cardiac cycle, Heart sounds

3.4 iv Cardiac output, arterial pulse

3.5 Composition and functions of blood lymph

3.6 RBC Blood groups

3.7 WBCS Immunity

3.8 Platelets, Blood coagulation

4. Respiratory system

4.1 Organization and functions of respiratory system, Mechanism of respiration

4.2 Treatment of O₂, Co₂, Regulation of respiration

4.3 Hypoxia, Asphyxia, Pulmonary function tests

5. Digestive System

5.1 Organization of digestive system, Functions of various components, Salivary, Gastric, Pancreatic secretion

5.2 Functions of liver, Small intestine and large intestine

6. Endocrine system

- 6.1 Hormones
- 6.2 Hypothalamus
- 6.3 Anterior and posterior pituitary
- 6.4 Thyroid, Parathyroid
- 6.5 Pancreas, Adrenal cortex

7. Excretory System

- 7.1 Formation of urine
- 7.2 Maturation, Renal function tests

8. Special Senses

- 8.1 Son, Smell
- 8.2 Hearing taste

9. Nervous system

- 9.1 Organization of the nervous system
- 9.2 Sensory System
- 9.3 Motor System
- 9.4 Brain
- 9.5 Autonomic nervous system

DMLTT103 : Basics of Biochemistry
(04 Credits – 60 Contact Hrs.)

Learning Outcomes:

After Completion of this course, students should be able to:

1. Recall the structure, function, and importance of biomolecules such as carbohydrates, proteins, lipids, and nucleic acids, foundational to biochemical processes. (Bloom's Level: Remember)
2. Analyze biochemical test results to identify deviations from normal values, enabling the diagnosis of metabolic and enzymatic disorders.

1. Basic Concept of Biochemistry

2. Introduction to Chemical Constituents of life

3. Biological Oxidation - ATP-ADP cycle, electron transport chain, inhibitors and uncouplers

4. Minerals: Importance of some minerals sodium, potassium, calcium, phosphorous, iron, copper, chloride and fluoride

5. Units of measurements: SI units, definitions, conversions, measurement of volumes, strength, normality, molarity, molality definitions, mole, molar and normal solutions (Preparations and standardization), pH (definition, pKa value, Example, importance of henderson- hasslebalch equation), Buffer solutions (definition, preparation of important solutions) pH Indicators (pH papers,

universal and other indicators) pH measurement different methods (pH paper, pH meter, principle of pH meter, structure, working and maintenance)

6. Water Metabolism: Acid based balance

7. Serum Tests: Liver function tests, Renal function test, Endocrine function tests, Lipid profile tests, Glucose tolerance test, CSF tests and Serum electrolytes.

DMLTT104: Basics of Pathology
(04 Credits – 60 Contact Hrs.)

Learning Outcomes:

After Completion of this course, students should be able to:

1. Explain the fundamental pathological processes and their impact on human tissues and organs.
2. Apply their knowledge of pathological mechanisms to prepare and analyze tissue samples, identifying abnormal cellular changes under a microscope.

1. Introduction to Pathology

2. Cell Injury

2.1 Cause and Mechanism - Ischemic, Toxic and Apoptosis

3. Inflammation and Repair

3.1 Acute inflammation: features, causes, vascular, cellular and cellular events

3.2 Wound healing by primary and secondary union, factors promoting and delaying the process and complications

4. Circulatory Disturbances

4.1 Infarction types common sites and Gangrene

5. Growth Disturbances

5.1 Neoplasia: Causes, classification, histogenesis, biological behavior, benign and malignant, carcinoma and sarcoma

6. Hematopathology

6.1 Anaemia - Classification and clinical features

6.2 Nutritional Anaemia- Iron deficiency, folic acid, vitamin B12 deficiency anaemia

6.3 Acute and chronic leukemia classification and diagnosis

7. Cardiovascular Pathology

7.1 Atherosclerosis and ischaemic heart disease, myocardial infarction respiratory pathology

7.2 Structure of bronchial tree and alveolar walls, normal and altered inflammatory diseases of bronchi, chronic bronchitis, bronchiectasis

8. Renal and urinary tract Pathology

8.1 Clinical Presentation of renal disorders including nephritic, nephrotic syndrome, acute renal failure, recurrent haematuria, CRF

9. Pathology of Gastrointestinal Tract

9.1 Inflammatory disease of small intestine- typhoid, tuberculosis, crohn's disease, appendicitis

10. Endocrine Pathology

10.1 Diabetes mellitus types, pathogenesis, pathology

10.2 Non neoplastic lesion of thyroid deficiency goiter, Autoimmune thyroiditis, Thyrotoxicosis, Myxedema

DMLTT105: Patient Safety and Infection Control

(04 Credits – 60 Contact Hrs.)

Learning Outcomes:

After Completion of this course, students should be able to:

1. Explain the principles of patient safety and the mechanisms of infection transmission in healthcare settings, ensuring adherence to standard safety protocols.
2. Demonstrate proper use of infection control measures, such as hand hygiene, personal protective equipment (PPE), and sterilization techniques, to minimize the risk of healthcare-associated infections.

1. Communicating Effectively

1.1 Involving patients as partners in healthcare

1.2 Communicating risks

1.3 Obtaining Consent

1.4 Being culturally respectful & Knowledgeable

2. Adverse events & near misses

2.1 Introduction & explanation to the terms

2.2 Adverse event forms

3. Working Safely

3.1 Being a team player

3.2 Understanding human factors

3.3 Providing continuity of care

4. Medication safety

4.1 Wrong site

4.2 Wrong patient

4.3 Wrong technique

4.4 Wrong dose

4.5 Wrong medicine

5. Why Infection control spread of infection control ways

1. Care of skin

2. Hand hygiene

3. Protective apparel

4. Procedure for safe handling of sharps
 5. Procedure for safe disposal of sharps
 6. Management of blood and body fluid spills
 7. Linen management (use & disposal)
 8. PPE
 - 8.1 Hand washing
 - 8.2 Gloves
 - 8.3 Masks, goggles & face masks
 - 8.4 Gowns
 9. Patient care equipment
 10. Environmental cleaning
 11. Management of sharps
-

Second Semester Syllabus

DMLTT201: Hematology and Clinical Pathology

(02 Credits – 30 Contact Hrs.)

Learning Outcomes:

After Completion of this course, students should be able to:

1. Explain the principles of hematological and clinical pathology techniques, including blood cell analysis, coagulation studies, and urine examination, to understand their diagnostic significance.
2. Interpret hematological and clinical pathology test results, assessing abnormalities to aid in the diagnosis of conditions such as anemia, infections, and coagulation disorders.

Hematology

- 1. Introduction to laboratories**
 - 1.1 Types of laboratories
 - 1.2 Standardized clinical lab set up
 - 1.3 Decontamination in labs
 - 1.4 Disinfection in labs
 - 1.5 Laboratory first aid kit and measures
 - 1.6 Responsibility of laboratory worker
 - 1.7 Laboratory safety
 - 1.8 Instructions to minimize the infections in lab workers
 - 1.9 Responsibility of student
- 2. Laboratory Glassware's and Equipments**
 - 2.1 Laboratory glassware's, Calibration of pipettes
 - 2.2 Laboratory reagents
 - 2.3 Lab equipments and appliances
- 3. Collection of Blood**
 - 3.1 Composition of blood and functions
 - 3.2 Anti-coagulants
 - 3.3 Preparation and examination of thick and thin film
 - 3.4 Staining of blood film
- 4. Haemopoiesis and Bone Marrow Examination**
 - 4.1 Haemopoiesis
 - 4.2 Bone marrow examination
 - 4.3 Peripheral blood cells
 - 4.4 Blood smear
5. Haemoglobin estimation
6. TLC
7. DLC
8. RBC Count

9. Absolute indices concentration
10. Platelet count
11. Reticulocyte counts
12. ESR
13. Introduction : Haemoglobinopathies
14. Introduction :Anemia

Clinical Pathology

15. Clinical Pathology
 - 15.1 Urine analysis
 - 15.2 Cerebrospinal fluid analysis
 - 15.3 Gastric analysis
 - 15.4 Other fluids analysis (Pericardial, Pleural Etc)
 - 15.5 Seminal fluid examination
 - 15.6 Sputum examination
 - 15.7 Stool examination
 - 15.8 Examination of intestinal parasites ova and cyst
 - 15.9 Classification of human parasites
 - 15.10 Protozoan parasites
 - 15.11 Nematodes
 - 15.12 Cestodes and Trematodes
 - 15.13 Immunodiagnostic parasitology

DMLTT202: Immunology and Serology **(02 Credits – 30 Contact Hrs.)**

Learning Outcomes:

After Completion of this course, students should be able to:

1. Explain the fundamental concepts of immunity, including the roles of antibodies, antigens, and immune responses, and their relevance to disease prevention and diagnosis.
2. Perform serological tests, such as ELISA and agglutination assays, to detect and identify immune responses associated with infections, autoimmune diseases, and allergies

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1. Immunology, Immune response and Immunity
 2. Immunodiagnosics EIA/ELISA
 3. Flow cell cytometry
 4. Techniques of QC
 5. Total quality management (TQM)
 6. Ethics in laboratory practice
 7. Laboratory safety
 8. Laboratory disposal

DMLTT203: Introduction of Histopathology, Cytology and Microbiology
(02 Credits – 30 Contact Hrs.)

Learning Outcomes:

After Completion of this course, students should be able to:

1. Describe the fundamental principles of histopathology, cytology, and microbiology including tissue preparation, cell examination, and microbial identification techniques.
2. Perform basic laboratory procedures such as tissue sectioning, staining, and microbial culture, ensuring accurate preparation and analysis of samples for diagnostic purposes

1. Introduction to histopathology and histotechnology
2. Methods of examination of cell and tissue
3. Fixatives
4. Reception processing and reporting
5. Embedding of tissue and paraffin block preparation
6. Automation in histotechnology
7. Section Cutting
8. Staining- hematoxylin and eosin
9. Mounting medias
10. Introduction to cytology
11. Cytology of various body fluids
12. FNAC
13. PAP
14. Giemsa's stain
15. Microbiology

General Bacteriology

Introduction to microbes, Source of infection, Models of spread, Bacterial Cell, Bacterial Spore, growth requirements of bacteria, Bacteria cycle

Identification of bacteria, Morphology principle and staining procedure, Gram's stain, Zeihl/Nelson stain, Modified ZN staining, Albert stain, Fontana's method, , Levaditi's Method

Basic Principles of antibiotic susceptibility method of sensitivity testing

Systemic Microbiology Study Bacteria: Gram Positive and Gram Negative Organisms

Staphylococci: Habitat, Morphology, Antigenic classification structure, Cultural characteristics, biochemical reactions, enzymes, Toxins, Pathogenicity, Serology, Sensitivity tests, Clinical importance

Streptococci: Morphology, Classification, Cultural characters, Toxins, Biochemical reactions, toxins, enzymes, pathogenicity, Serology, antibiotic, Sensitivity tests, Anaerobic streptococci, pathogenicity, clinical importance

Pneumococci: Morphology, Cultural Characteristics, Biochemical properties, Antigenic structure, Pathogenicity, Bacterial Sensitivity, Laboratory diagnostics

Neisseria: Human Pathogens, Gram coccus, Morphology Culture characteristics, Biochemical reactions, Pathogenesis, Laboratory diagnosis, Meningococcus, Morphology culture characteristics, Biochemical reactions, Pathogenicity, Laboratory diagnosis

Mycobacterium tuberculosis: Morphology, staining, Cultural Characters, BCG Vaccine, Tuberculin test, Pathogenicity, Lab Diagnosis, Atypical mycobacteria, Clinical importance

Gram Negative and Gram Positive organisms - Enterobacteriaceae and other Organism, Enterobacteriaceae and related gram negative organisms Escherichia Coli, Klebsiella, Proteus, Pseudomonas, Salmonella, Shigella, Vibrio- ELTOR, and allied organisms, Morphology, Staining, Cultural characteristics, Antigenic structure, Pathogenicity, Lab Diagnosis

Basic Virology

Basic Virology, General properties of virus, HIV and AIDS, Hepatitis virus, Hepatitis A, B, C, D and E of various types of hepatitis virus

DMLTT211: On-the-Job Training
(14 Credits – 420 Contact Hours)

Every student should complete On-the-Job Training of said period in recognized hospital and submit detailed report after completion.



REFERENCES

Course Name	Title	Author(s)
Basic of Anatomy	Grays's Anatomy	Sasan Standring
	Textbook of Medical Laboratory Technology	Praful. B. Godkar , Darshan P. Godkar
	Medical Laboratory Technology Vol. 1 (Revised in 2021)	
	Medical Laboratory Technology Vol. 2 (Revised in 2021)	
	Concise Medical Physiology	Sujit K. Chaudhari
Basic of Physiology	Medical Laboratory Technology Methods & interpretations	Sood
	Human Anatomy Vol.1 &2	BD Chaurasiya
	Anatomy & physiology for general Nursing	Raju Bindu
Basic of Biochemistry	Biochemistry	U. Satyanarayana, U. Chakrapani
	Biochemistry Vol-1, 2 & 3	Dr. D S Haque
	Fundamentals of Biochemistry	Deb, A.C.

	Handbook of biochemistry	Siddiqi, M A
	Clinical biochemistry	Karajgaonkar, Rajesh
	Biochemistry for Nurses	Anthikad, jacob
Basic of Pathology	Textbook of pathology	Mohan, Harsh
	Pathologic basic of disease	Robbins & Controm
	Pharmacology and pharmatherapeutics	R S. Satoskar, Nirmala N. Rege, S.D. Bhandarkar
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	Essentials of Medical Pharmacology	
	Pathology Quick Review and MCQ	Mohan, Harsh
Patient safety	Godkar vol.1 and 2	Praful. B. Godkar , Darshan P. Godkar
Hematology and Clinicaal Pathology	Hematology for students and practitioners	Sood, Ramnik
	Clinical pathology hametology and blood banking	Maheshwari, Nanda
Immunology and Serology	Textbook of Medical Laboratory Technology	Praful. B. Godkar , Darshan P. Godkar
	Medical Laboratory Technology Vol. 1	
	Medical Laboratory Technology Vol. 2	
Introduction of Histopathology, Cytology and Microbiology.	Medical laboratory Technology	Sood
	Medical laboratory Technology	Mukherjee
	Medical laboratory Technology	Mukherjee Ghosh
	Medical microbiology	Nagaba ,Pichare
	Essentials of Medical microbiology	Bhatia ichhpujani
	microbiology Theory FOR MLT	Jaggi
	Textbook of microbiology	Wani, Imtiyaz
	Illustrated Medical Microbiology	Gupte
	Textbook of microbiology Vol. I, II & III	Wani, Imtiyaz

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