

DR. BABASAHEB AMBEDKAR MARATHWADA UNIVERSITY
Chhatrapati Sambhajinagar.



NAAC- 'A+' Grade

CIRCULAR /SU/ AEDP / Sci & Tech./ Comm.& Mang. / Humani. /79/2026

It is hereby inform to all concerned that, on the recommendation of the Board of Dean's,; the Academic Council at its meeting held on 02 june, 2026 has been accepted the following Subject wise under "Apprenticeship Embedded Degree Programme (AEDP) " run at colleges level.

Sr.No.	Name of the Courses's	Faculty	College Name	Semester
1	B.Sc.Industrial Chemistry (AEDP)	Science & Technology	Maulana Azad College of Arts, Science & Commerce Chhatrapati Sambhajinagar	III & IV
2	B.A. Psychology (AEDP)	Humanities		
3	B.Sc.Medical Laboratory Technology (AEDP)	Science & Technology	Deogiri College (Autonomous) Chhatrapati Sambhajinagar.	
4	B.Com in Banking, Financial Services and Insurance (AEDP)	Commerce & Management		

This is effective from the Academic Year 2026-27 and Onwards as per appended herewith.

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

University Campus,
Chhatrapati Sambhajinagar
-431 004.

REF.NO. SU/2026 / 124-27

Date:- 05 /06 / 2026.

★
★
★
★
★

*Deputy Registrar,
Syllabus Section*

Copy forwarded for Information and necessary action:-

- 1] The Principal, Maulana Azad College of Arts, Science & Commerce Dr. Rafiq Zakaria Campus, Chhatrapati Sambhajinagar.
 - 2] The, Principal, Deogiri College (Autonomous), railway station road Chhatrapati Sambhajinagar.
 - 3] The Director, Board of Examination & Evaluation,
 - 4] The Director, University Network & Information Centre, UNIC, with a **request to upload this Circular on University Website.**
- Dr.Babasaheb Ambedkar Marathwada University Chhatrapati Sambhajinagar.

M.S.P. MANDAL'S

**DEOGIRI COLLEGE,
CHHATRAPATI SAMBHAJINAGAR**

(An Autonomous College affiliated to Dr. Babasaheb Ambedkar
Marathwada University, Chhatrapati Sambhajinagar)



(NAAC RE-ACCREDITED "A++" Grade with 3.59 CGPA (IV Cycle))

FACULTY OF SCIENCE & TECHNOLOGY

**3 Years Apprenticeship Embedded Degree
Programme (AEDP) in
B.Sc. Medical Laboratory Technology (B.Sc. MLT)
Second & Third Year**

Course Structure & Curriculum

As per National Education Policy-2020

(Outcome Based Credit System)

(Effective from 2026-27)


(Jadhav M.A.)
Head
Department of Biotechnology
Deogiri College, Chhatrapati Sambhajinagar


Dean,
Faculty of Science & Technology,
Dr. Babasaheb Ambedkar
Marathwada University,
Chhatrapati Sambhajinagar

Structure of B. Sc. Three Year Apprenticeship Embedded Degree Programme (AEDP) with Multiple Entry and Exit Options

Class: B.Sc Second Year

Subject (Major): Medical Laboratory Technology

Semester: III

Course Type	Course Code	Course Name	Teaching Scheme(Hrs / Week)		Credits Assigned		Total Credits
			Theor y	Pract	Theor y	Pract	
Major (Core) Mandatory	DSC-13/BMLT/T/301	Clinical Pathology	2	-	2	-	4
	DSC-14/BMLT/P/302	Practical based on DSC-13/BMLT/T/301	-	4	-	2	
	DSC-15/BMLT/T/303	Hematology-I	2	-	2	-	4
	DSC-16/BMLT/P/304	Practical based on DSC-15/BMLT/T/303	-	4	-	2	
Minor	MN-1/BMLT/T/305	Immunology & Serology	2	-	2	-	4
	MN-2/BMLT/P/306	Practical based on MN-1/BMLT/T/305	-	4	-	2	
Generic / Open Elective (GE/OE)	GE/OE-3/BMLT/T/307	Public Health & Hygiene	2	-	2	-	2
VSC (Vocational Skill Course)	VSC-3/BMLT/T/308	Bacteriology & Virology	1	-	1	-	2
	VSC-4/BMLT/P/309	Practical based on VSC-3/BMLT/T/308	-	2	-	1	
AEC (Choose any one from pool of courses)	AEC-3/ENG/T/310 AEC-3/MAR/T/310 AEC-3/HIN/T/310 AEC-3/SAN/T/310	English for All-I Sanhita Lekhan Sankalpana Va Swarup Hindi Ghazal Sahitya Sanskrit Kaviparichyah	2	-	2	-	2
VEC (Value Education Course)	VEC-2/ENV/T/311	Environmental Studies	2	-	2	-	2
CC (Choose any one from pool of courses)	CC-3/PHYE/312	Health & Wellness	-	4	-	2	2
	CC-3/YOG/312	Yoga Education	-	4	-	2	
	CC-3/NSS/312	NSS	-	4	-	2	
	CC-3/NCC/312	NCC	-	4	-	2	
	CC-3/CUL/312	Cultural Activity	-	4	-	2	
			11	22	11	11	22

Class: B.Sc Second Year

Subject (Major): Medical Laboratory Technology

Semester: IV

Course Type	Course Code	Course Name	Teaching Scheme (Hrs / Week)		Credits Assigned		Total Credits
			Theor y	Pract	Theory	Pract	
Major (Core) Mandatory	DSC-17/BMLT/T/401	Histopathology	2	-	2	-	4
	DSC-18/BMLT/P/402	Practical based on DSC-17/BMLT/T/401	-	4	-	2	
Major (Core) Mandatory	DSC-19/BMLT/T/403	Hematology-II	2	-	2	-	4
	DSC-20/BMLT/P/404	Practical based on DSC-19/BMLT/T/403	-	4	-	2	
Minor	MN-3/BMLT/T/405	Clinical Biochemistry-II	2	-	2	-	4
	MN-4/BMLT/P/406	Practical based on MN-3/BMLT/T/405	-	4	-	2	
Generic / Open Elective (GE/OE)	GE/OE-4/BMLT/407	Medical Ethics & Patient Care	2	-	2	-	2
SEC (Skill Enhancement Course)	SEC-3/BMLT/T/408	Parasitology & Mycology	1	-	1	-	2
	SEC-4/BMLT/P/409	Practical based on SEC-3/BMLT/T/408	-	2	-	1	
AEC (Ability Enhancement Course)	AEC-4/ENG/T/410	English for All-II	2	-	2	-	2
Field Project (Topic of the Field Project will be allotted to the student by the concerned teacher)	FP-1/BMLT/P/411	Field Project-I	-	4	-	2	2
CC (Choose any one from pool of courses other than Sem-I)	CC-4/PHYE/T/412	Sport and Fitness	2	-	2	-	2
	CC-4/YOG/T/412	Yoga Education	2	-	2	-	
	CC-4/NSS/T/412	NSS	2	-	2	-	
	CC-4/NCC/T/412	NCC	2	-	2	-	
	CC-4/CUL/T/412	Cultural Activity	2	-	2	-	
			13	18	13	09	22

Exit Option : Award of UG Certificate in Majors & Minor with 88 credits and an additional 4 credits of core NSQF course/ Internship OR continue with Major and Minor

Class: B.Sc Third Year

Subject (Major): Medical Laboratory Technology

Semester: V

(Apprenticeship Module)

Course Type	Course Code	Course Name	Teaching Scheme(Hrs / Week)		Credits Assigned		Total Credits
			Theory	Pract	Theory	Pract	
Major (Core) Mandatory	DSC- 17/BMLT/P/501	Apprenticeship-I	-	30	-	22	22
Total Hrs. of Semester-V apprenticeship =720 Hrs.							

Sem-V Apprenticeship Modules Credit Distribution (22 Credits)

Module No.	Topics Covered	Credits
1	Orientation to Pathology Laboratory: Safety protocols, standard operating procedures (SOPs), biomedical waste management, record-keeping practices	2
2	Hematology: Sample collection techniques, complete blood count (CBC), ESR, peripheral smear preparation, blood grouping, cross-matching	4
3	Clinical Biochemistry: Specimen collection, tests for glucose, lipids, liver and renal function tests, electrolytes, quality control	4
4	Clinical Pathology: Urinalysis, stool examination, CSF and body fluid analysis, basic interpretation of results	3
5	Histopathology and Cytology: Tissue processing, section cutting, H&E staining, basics of cytological examination	3
6	Microbiology Basics: Collection and transport of specimens, culture methods, Gram staining, antibiotic susceptibility testing	3
7	Professional Skills: Effective communication, basic laboratory informatics, ethical practices, patient data confidentiality	3

Class: B.Sc. Third Year Subject (Major): Medical Laboratory Technology

Semester: VI

(Advanced Apprenticeship Module)

Course Type	Course Code	Course Name	Teaching Scheme (Hrs / Week)		Credits Assigned		Total Credits
			Theory	Pract	Theory	Pract	
Major (Core) Mandatory	DSC- 22/BMLT/P/ 601	Apprenticeship-II	-	30	-	22	22
Total Hrs. of Semester-VI apprenticeship =720 Hrs.							
Exit option : Award of UG degree in Major with 132 credits							

Sem-VI Advanced Apprenticeship Modules Credit Distribution (22 Credits)

Module No.	Topics Covered	Credits
1	Advanced Hematology: Coagulation profile (PT, aPTT), bone marrow aspirations, advanced cell morphology	3
2	Advanced Biochemistry: Automation in clinical biochemistry, troubleshooting equipment, advanced test panels	4
3	Immunology and Serology: ELISA, immunofluorescence, rapid immunoassays, result interpretation	3
4	Advanced Microbiology: Mycology, parasitology, molecular diagnostics (PCR basics), biosafety protocols for infectious samples	4
5	Laboratory Management & Quality Assurance: Equipment calibration, quality control (internal and external), documentation and reporting	4
6	Professional Development: Advanced communication skills, teamwork in healthcare, ethics, data analysis and laboratory reporting	4

Curriculum
B.Sc. Medical Laboratory
Technology (BMLT)
S.Y. Semester-III

Name of the Course: Clinical Pathology		
Course Type: Major (DSC)		Course Code: DSC-13/BMLT/T/301
Contact Hours : 30 Hrs		Credit: 02
Hours/Week: 02		Total Marks: 50
Course Objectives: - To introduce the fundamentals of clinical pathology and its diagnostic importance. - To understand the physical, chemical, and microscopic examination of body fluids. - To develop skills in routine laboratory investigations of urine, stool, and other specimens. - To familiarize students with hematological and cytological screening techniques. - To ensure proper sample collection, handling, and reporting practices. Course Outcomes (COs) : After completion of the course, students will be able to - - Explain the principles and scope of clinical pathology. - Perform routine examination of urine and interpret findings. - Analyze stool samples for parasitic and pathological conditions. - Conduct basic hematological and cytological tests. - Maintain laboratory safety, quality control, and proper reporting.		
Module No.	Topics / actual contents of the syllabus	Contact Hours
I	Introduction to Clinical Pathology & Urine Examination- Introduction, scope, and importance of clinical pathology, Laboratory organization, safety, and quality control. Urine Examination: Formation and composition of urine, Collection and preservation of urine samples, Physical examination: colour, appearance, volume, specific gravity, Chemical examination: pH, protein, glucose, ketone bodies, bile salts, bile pigments, Microscopic examination: RBCs, WBCs, epithelial cells, casts, crystals, microorganisms, Clinical significance of abnormal findings.	10

II	Stool Examination and Other Body Fluids-Stool Examination: Collection and preservation of stool samples, Macroscopic examination: colour, consistency, mucus, blood, Microscopic examination: ova, cysts, parasites, Occult blood test and clinical significance. Other Body Fluids: Cerebrospinal fluid (CSF): collection, physical, chemical, and microscopic examination, Pleural, peritoneal, and synovial fluids: basic analysis, Semen analysis: collection, physical and microscopic examination, Clinical significance of findings.	10
III	Hematology & Cytology (Basic)-Introduction to hematology in clinical pathology, Hemoglobin estimation methods (overview), Total RBC and WBC count (introductory), Peripheral blood smear: preparation and staining (introductory), Cytology: Introduction to cytology and its diagnostic importance, Exfoliative cytology (Pap smear – overview), Fine needle aspiration cytology (FNAC – basic concept), Quality Assurance & Reporting: Laboratory errors and quality control, Record keeping and report preparation, Ethical considerations in clinical laboratory practice.	10
Text Books: Essentials of Hematology by A. V. Hoffbrand and J. E. Pettit		
Reference Books: - The Textbook of Medical Laboratory Technology by Praful B. Godkar and Darshan P. Godkar - Practical Clinical Pathology by Harsh Mohan - Medical Laboratory Technology: Methods and Interpretations by Ramnik Sood - Clinical Diagnosis and Management by Laboratory Methods by John Bernard Henry		

Name of the Course: Practical based on DSC-13/BMLT/T/301	
Course Type: Major (DSC)	Course Code: DSC-14/BMLT/P/302
Contact Hours : 60 Hrs	Credit: 02
Hours/Week: 04	Total Marks: 50
Practical:	
1.	Introduction to Clinical Laboratory & Safety Measures-Use of PPE, biosafety, waste disposal & Study of Laboratory Equipment Microscope, centrifuge, urinometer, hemocytometer.
2.	Collection and Preservation of Urine Samples & Physical Examination of Urine-Colour, appearance, volume, specific gravity
3.	Chemical Examination of Urine: Tests for protein, glucose, ketone bodies, bile salts, bile pigments & Microscopic Examination of Urine: Detection of RBCs, WBCs, epithelial cells, casts, crystals.
4.	Collection and Macroscopic Examination of Stool-Colour, consistency, mucus, blood & Microscopic Examination of Stool- Identification of ova, cysts, and parasites.
5.	Occult Blood Test in Stool
6.	Examination of Cerebrospinal Fluid (CSF) (Demonstration/Simulated) & Physical and microscopic examination Examination of Pleural/Ascitic Fluid (Demonstration)-Basic analysis.
7.	Hemoglobin Estimation-Sahli's method or Cyanmethemoglobin method
8.	Total RBC Count using Hemocytometer
9.	Total WBC Count using Hemocytometer
10.	Preparation and Staining of Peripheral Blood Smear- Leishman/Giemsa stain
11.	Study of Cytological Slides (Pap smear – demonstration)
12.	Laboratory Report Writing-Urine/stool/hematology report format
13.	Case-Based Interpretation Correlation of findings with clinical conditions

Text Books:

- Essentials of Hematology by A. V. Hoffbrand and J. E. Pettit

Reference Books:

- The Textbook of Medical Laboratory Technology by Praful B. Godkar and Darshan P. Godkar
- Practical Clinical Pathology by Harsh Mohan
- Medical Laboratory Technology: Methods and Interpretations by Ramnik Sood
- Clinical Diagnosis and Management by Laboratory Methods by John Bernard Henry

Name of the Course: Hematology-I		
Course Type: Major (DSC)		Course Code: DSC-15/BMLT/T/303
Contact Hours : 30 Hrs		Credit: 02
Hours/Week: 02		Total Marks: 50
Course Objectives: • To introduce the basic concepts of hematology and blood physiology. • To understand the formation, structure, and functions of blood cells. • To develop knowledge of routine hematological investigations. • To familiarize students with blood collection, anticoagulants, and laboratory safety. • To provide a foundation for diagnosis of common hematological disorders. Course Outcomes (COs) : After completion of the course, students will be able to - • Explain the composition and functions of blood. • Describe hematopoiesis and morphology of blood cells. • Perform basic hematological tests and interpret results. • Understand principles of anticoagulants and blood collection techniques. • Identify common hematological disorders based on laboratory findings.		
Module No.	Topics / actual contents of the syllabus	Contact Hours
I	Introduction to Hematology & Blood Composition- Introduction, scope, and importance of hematology, Composition of blood: plasma and formed elements, Functions of blood, Hematopoiesis: Sites and stages of blood cell formation, Stem cells and differentiation pathways. Blood Collection & Anticoagulants: Methods of blood collection (venous and capillary), Anticoagulants: EDTA, heparin, citrate – types and uses, Safety precautions and biomedical waste management.	10

II	Red Blood Cells & Hemoglobin-Morphology and function of RBCs, Erythropoiesis and regulation. Hemoglobin: Structure and types of hemoglobin, Hemoglobin estimation methods (Sahli's, Cyanmethemoglobin – overview), RBC Indices: MCV, MCH, MCHC – calculation and significance Anemia: Introduction and classification (morphological), Basic laboratory findings in anemia.	10
III	White Blood Cells, Platelets & Hemostasis-Morphology and function of WBCs, Differential leukocyte count (introductory), Platelets: Structure and function, Platelet count (introductory). Hemostasis: Mechanism of blood clotting, Coagulation factors (overview), Bleeding time and clotting time (principles), Common Hematological Disorders (Introductory): Leukemia (basic concept), Thrombocytopenia and clotting disorders.	10
Text Books: The Textbook of Medical Laboratory Technology by Praful B. Godkar and Darshan P. Godkar		
Reference Books: - Dacie and Lewis Practical Haematology by Barbara J. Bain, Imelda Bates, and Mike A. Laffan - Essentials of Hematology by A. V. Hoffbrand and J. E. Pettit - Wintrobe's Clinical Hematology by Maxwell M. Wintrobe		

Name of the Course: Practical based on DSC-15/BMLT/T/303	
Course Type: Major (DSC)	Course Code: DSC-16/BMLT/P/304
Contact Hours : 60 Hrs	Credit: 02
Hours/Week: 04	Total Marks: 50
Practical:	
1.	Blood Collection Techniques-Capillary puncture and venipuncture (demonstration/practice)
2.	Study of Anticoagulants-EDTA, citrate, heparin and their uses
3.	Packed Cell Volume (PCV) / Hematocrit-Wintrobe method / Microhematocrit method
4.	Calculation of RBC Indices-MCV, MCH, MCHC (from given data)
5.	Differential Leukocyte Count (DLC)-Identification of neutrophils, lymphocytes, monocytes, eosinophils, basophils
6.	Preparation of Peripheral Blood Smear
7.	Microscopic Examination of Blood Smear-Identification of RBC, WBC, platelets
8.	Platelet Count (Introductory/Demonstration)
9.	Bleeding Time (BT) Determination-Duke's method (principle/demo) & Clotting Time (CT) Determination-Capillary method (principle/demo)
10.	Identification of Abnormal RBC Morphology-Anisocytosis, poikilocytosis (slide study)
11.	Case-Based Hematological Interpretation-Anemia and infection-related findings
12.	Laboratory Report Writing-Hematology report format
Text Books:	
The Textbook of Medical Laboratory Technology by Praful B. Godkar and Darshan P. Godkar	
Reference Books:	
- Dacie and Lewis Practical Haematology by Barbara J. Bain, Imelda Bates, and Mike A. Laffan - Essentials of Hematology by A. V. Hoffbrand and J. E. Pettit	

Name of the Course: Immunology & Serology		
Course Type: Minor		Course Code: MN-1/BMLT/T/305
Contact Hours : 30 Hrs		Credit: 02
Hours/Week: 02		Total Marks: 50
Course Objectives: • To introduce the fundamentals of the immune system and immune responses. • To understand antigen-antibody interactions and serological principles. • To develop knowledge of immunological techniques used in diagnosis. • To familiarize students with infectious diseases and immune disorders. • To ensure proper handling, testing, and interpretation of serological samples		
Course Outcomes (COs) :		
After completion of the course, students will be able to - • Explain the structure and functions of the immune system. • Describe antigen-antibody reactions and their applications. • Perform and interpret basic serological tests. • Understand immunological basis of infectious and autoimmune diseases. • Apply quality control and safety in immunology laboratories.		
Module No.	Topics / actual contents of the syllabus	Contact Hours
I	Basics of Immunology-Introduction, scope, and importance of immunology, Cells and organs of the immune system, Lymphocytes (B cells, T cells), macrophages, dendritic cells Primary and secondary lymphoid organs, Types of immunity: innate and acquired immunity, Antigens: structure, types, and properties, Antibodies (Immunoglobulins): structure, classes (IgG, IgM, IgA, IgE, IgD) and functions, Antigen-antibody interactions: principles and factors affecting reactions.	10

II	Serological Techniques- Introduction to serology and its diagnostic importance, Precipitation reactions (e.g., ring test), Agglutination reactions (slide and tube methods), Complement system and complement fixation test (basic concept), Enzyme-linked immunosorbent assay (ELISA) – principle and applications, Rapid diagnostic tests (RDTs) Immunodiffusion and immunoelectrophoresis (introductory), Quality control in serological testing.	10
III	Clinical Immunology & Applications-Immune response to infections (bacterial, viral, parasitic), Hypersensitivity reactions (Types I-IV), Autoimmune disorders (basic concepts), Immunodeficiency disorders (primary and secondary), Serological Tests in Clinical Practice: Widal test (typhoid), VDRL test (syphilis), CRP, ASO tests (inflammation markers), HIV, Hepatitis (introductory screening methods), Blood grouping and Rh typing (basic concept), Laboratory safety and ethical considerations.	10

Text Books:

- Clinical Immunology and Serology: A Laboratory Perspective by Christine Dorresteyn Stevens

Reference Books:

- Kuby Immunology by Judy Owen, Jenni Punt, and Sharon Stranford
- Immunology by Ivan Roitt, Jonathan Brostoff, and David Male
- The Textbook of Medical Laboratory Technology by Praful B. Godkar and Darshan P. Godkar
- Janeway's Immunobiology by Kenneth Murphy and Casey Weaver
- Medical Laboratory Technology: Methods and Interpretations by Ramnik Sood

Name of the Course: Practical based on MN-1/BMLT/T/305	
Course Type: Minor	Course Code: MN-2/BMLT/P/306
Contact Hours : 60 Hrs	Credit: 02
Hours/Week: 04	Total Marks: 50
Practical:	
1.	Collection and Handling of Blood Samples-Serum and plasma separation
2.	Precipitation Reaction-Ring test / gel diffusion (demonstration)
3.	Agglutination Tests-Slide agglutination & Tube agglutination
4.	Latex Agglutination Test-Detection of CRP or Rheumatoid factor
5.	Widal Test-Slide and tube method for typhoid diagnosis
6.	VDRL Test (Demonstration)-Screening test for syphilis
7.	Rapid Diagnostic Tests (RDTs)-HIV/Hepatitis (demonstration/simulated kits)
8.	ELISA (Demonstration/Simulated)-Principle and interpretation of results
9.	ABO Blood Grouping-Slide/tile method
10.	Rh Typing
11.	Interpretation of Serological Test Results-Positive/negative reactions & Quality Control in Serological Tests
12.	Laboratory Report Writing-Format for serology reports
Text Books:	
Clinical Immunology and Serology: A Laboratory Perspective by Christine Dorresteyn Stevens	
Reference Books:	
- Kuby Immunology by Judy Owen, Jenni Punt, and Sharon Stranford - Immunology by Ivan Roitt, Jonathan Brostoff, and David Male - The Textbook of Medical Laboratory Technology by Praful B. Godkar and Darshan P. Godkar - Janeway's Immunobiology by Kenneth Murphy and Casey Weaver	

Name of the Course: Public Health & Hygiene		
Course Type: Minor		Course Code: GE/OE-3/BMLT/T/307
Contact Hours : 30 Hrs		Credit: 02
Hours/Week: 02		Total Marks: 50
Course Objectives: - To introduce basic concepts of public health and community hygiene. - To understand determinants of health, disease prevention, and control measures. - To develop awareness about sanitation, nutrition, and environmental health. - To familiarize students with national health programs and public health policies. - To promote healthy lifestyle practices and community responsibility. Course Outcomes (COs) : After completion of the course, students will be able to - - Explain concepts and scope of public health and hygiene. - Identify factors affecting health and disease transmission. - Apply principles of sanitation, nutrition, and environmental hygiene. - Understand national health programs and preventive strategies. - Promote awareness of health, hygiene, and disease prevention in the community.		
Module No.	Topics / actual contents of the syllabus	Contact Hours
I	Introduction to Public Health & Hygiene-Definition, scope, and importance of public health, Concepts of health and disease, Determinants of health: social, environmental, biological, and behavioral factors, Levels of prevention: primary, secondary, tertiary, Personal hygiene: Skin, hair, oral, hand hygiene, Importance of sanitation and cleanliness.	10

II	Environmental Health & Nutrition-Environmental Health: Water hygiene: sources, purification, and water-borne diseases, Air pollution and health effects, Waste management: solid and biomedical waste, Housing and sanitation, Nutrition: Balanced diet and nutritional requirements, Malnutrition: types and prevention, Food hygiene and food safety, Common nutritional deficiency diseases.	10
III	Disease Prevention & Public Health Programs-Communicable Diseases: Modes of transmission, Prevention and control measures, Vector-borne diseases (malaria, dengue – overview), Non-Communicable Diseases: Lifestyle diseases: diabetes, hypertension (introductory) Prevention and control, Immunization: Importance of vaccination, National immunization schedule (India – overview), Public Health Programs: National health programs (TB, HIV/AIDS, malaria – overview), Role of health workers and community participation, Health Education: Methods of health education and awareness, Role of laboratory professionals in public health.	10
Text Books: • Park's Textbook of Preventive and Social Medicine by Dr. K. Park		
Reference Books: • Textbook of Community Medicine by Sunder Lal, Adarsh, and Pankaj • Essentials of Community Medicine by Dr. Saket Kumar • Public Health and Preventive Medicine edited by Maxcy-Rosenau-Last • Health and Hygiene by B. Srilakshmi		

Name of the Course: Bacteriology & Virology		
Course Type: VSC		Course Code: VSC-3/BMLT/T/308
Contact Hours : 30 Hrs		Credit: 01
Hours/Week: 02		Total Marks: 50
Course Objectives: • To introduce basic concepts of bacteriology and virology relevant to clinical laboratories. • To understand morphology, classification, and growth of bacteria and viruses. • To develop knowledge of common pathogenic microorganisms and infections. • To familiarize students with diagnostic techniques used in microbiology labs. • To ensure awareness of biosafety and infection control practices.		
Course Outcomes (COs) :		
After completion of the course, students will be able to - • Explain basic structure and classification of bacteria and viruses. • Describe growth, culture, and identification of bacteria. • Understand viral structure, replication, and transmission. • Apply basic diagnostic techniques in bacteriology and virology. • Follow biosafety and infection control measures in laboratory settings.		
Module No.	Topics / actual contents of the syllabus	Contact Hours
I	Bacteriology-Introduction to bacteriology: scope and importance, Morphology and structure of bacteria, Classification of bacteria. Bacterial Growth & Culture: Nutritional requirements and growth conditions, Culture media: types and preparation, Sterilization and disinfection methods, Identification of Bacteria: Staining techniques: Gram staining, acid-fast staining, Biochemical tests, Common Pathogenic Bacteria (Overview): <i>Staphylococcus</i> , <i>Streptococcus</i> , <i>Escherichia coli</i> , <i>Salmonella</i> , <i>Mycobacterium tuberculosis</i> Antimicrobial Sensitivity: Concept of antibiotics and resistance.	10

II	Virology-Introduction to virology: scope and importance, Structure and classification of viruses, Viral replication cycle, Pathogenic Viruses (Overview): Hepatitis viruses, HIV, Influenza virus, Dengue virus, Laboratory Diagnosis of Viral Infections: Specimen collection and transport, Serological methods (ELISA, rapid tests), Molecular methods (PCR – basic concept), Infection Control & Prevention: Vaccination and immunization, Biosafety in virology laboratory.	10
Text Books: Ananthanarayan and Paniker's Textbook of Microbiology by R. Ananthanarayan and C. K. Jayaram Paniker		
Reference Books: - Medical Microbiology by David Greenwood, Richard Slack, and John Peutherer - Basic Virology by Edward K. Wagner and Martinez J. Hewlett - District Laboratory Practice in Tropical Countries, by Monica Cheesbrough - Clinical Microbiology Made Ridiculously Simple by Mark T. Gladwin, M.D., and William Trattler, M.D.		

Name of the Course: Practical based on VSC-3/BMLT/T/308	
Course Type: VSC	Course Code: VSC-4/BMLT/P/309
Contact Hours : 30 Hrs	Credit: 01
Hours/Week: 02	Total Marks: 50
Practical:	
1.	Preparation of Culture Media (Demonstration)-Nutrient agar/broth
2.	Inoculation Techniques-Streaking, spreading, and stab culture methods
3.	Gram Staining Technique-Identification of Gram-positive and Gram-negative bacteria
4.	Acid-Fast Staining (Ziehl-Neelsen) (Demonstration)
5.	Observation of Bacterial Morphology-Cocci, bacilli, spirilla (slide study)
6.	Biochemical Tests (Introductory)-Catalase, oxidase, sugar fermentation (demonstration)
7.	Antibiotic Sensitivity Test (Kirby-Bauer Method) (Demo)
8.	Specimen Collection and Transport for Viral Diagnosis
9.	Serological Tests for Viral Infections-Rapid diagnostic kits (HIV, Hepatitis – demonstration)
10.	ELISA (Demonstration/Simulation)-Principle and result interpretation
11.	Identification of Bacterial Culture Results-Colony morphology interpretation
12.	Recording and Reporting of Microbiological Results
Text Books:	
Ananthanarayan and Paniker's Textbook of Microbiology by R. Ananthanarayan and C. K. Jayaram Paniker	
Reference Books:	
- Medical Microbiology by David Greenwood, Richard Slack, and John Peutherer - Basic Virology by Edward K. Wagner and Martinez J. Hewlett - District Laboratory Practice in Tropical Countries, by Monica Cheesbrough	

Name of the Course: English/Marathi/Hindi/Sanskrit (Choose any 01 from pool of courses)	
Course Type: AEC	Course Code: AEC-3/ENG/T/310-English Course Code: AEC-3/MAR/T/310-Sanhita Lekhan Sankalpana Va Swarup Course Code: AEC-3/HIN/T/310-Hindi Ghazal Sahitya Course Code: AEC-3/SAN/T/310-Sanskrit Kaviparichyah
Contact Hours : 30 Hrs	Credit: 02
Hours/Week: 02	Total Marks: 50
(Syllabus of above course is available on respective BOS or College Website)	

Name of the Course: Environmental Studies	
Course Type: VEC	Course Code: VEC-2/ENV/T/311
Contact Hours : 30 Hrs	Credit: 02
Hours/Week: 02	Total Marks: 50
(Syllabus of above course is available on respective BOS or College Website)	

Co-Curricular Courses (CC-3)

(Choose any one subject as a CC-3 from following pool of subjects)

Course Type: CC	Credit: 02
Contact Hours : 30 Hrs	Total Marks: 50
Hours/Week: 02	
Course Code:	Name of the Course
CC-3/PHYE/T/312	Health & Wellness
CC-3/YOG/T/312	Yoga Education
CC-3/NSS/T/312	NSS
CC-3/NCC/T/312	NCC
CC-3/CUL/T/312	Cultural Activity
(Syllabus of above course is available on respective BOS or College Website)	

Curriculum
B.Sc. Medical Laboratory
Technology (BMLT)
S.Y. Semester-IV

Name of the Course: Histopathology		
Course Type: Major (DSC)		Course Code: DSC-17/BMLT/T/401
Contact Hours : 30 Hrs		Credit: 02
Hours/Week: 02		Total Marks: 50
Course Objectives: - To introduce the fundamental principles and techniques of histopathology. - To understand tissue processing, sectioning, and staining methods. - To develop knowledge of microscopic structure of normal and diseased tissues. - To familiarize students with biopsy handling and diagnostic applications. - To ensure adherence to laboratory safety and quality control practices. Course Outcomes (COs) : After completion of the course, students will be able to - - Explain basic concepts and importance of histopathology. - Describe tissue processing, embedding, and microtomy techniques. - Understand staining methods and their diagnostic significance. - Identify normal and abnormal tissue structures. - Apply quality control and safety measures in histopathology laboratory.		
Module No.	Topics / actual contents of the syllabus	Contact Hours
I	Basic Histopathology Techniques-Introduction, scope, and importance of histopathology, Structure of tissues and cells (basic overview), Fixation: principles, purpose, and types of fixatives (formalin, Bouin's fluid), Tissue processing: Dehydration, Clearing, Infiltration, Embedding techniques (paraffin embedding) Microtomy: Types of microtomes, Section cutting and ribbon formation, Mounting and preservation of sections, Laboratory safety and precautions.	10
II	Staining Techniques-Principles of staining, routine staining: Hematoxylin and Eosin (H&E) staining, Special stains (introductory): PAS stain, Silver stain, Ziehl-Neelsen stain (for demonstration), Factors affecting staining quality, Common staining errors and troubleshooting.	10

III	Clinical Histopathology & Applications-Types of biopsy: incisional, excisional, needle biopsy, Handling and processing of biopsy specimens, Frozen section technique (introductory), Basic histopathological changes: Inflammation, Degeneration, Necrosis, Tumor pathology (introductory): Benign vs malignant tumors, Introduction to Immunohistochemistry (IHC): principle and applications, Quality Assurance & Reporting: Quality control in histopathology lab, Documentation and report writing, Safety & Ethics: Biosafety measures, Ethical considerations in specimen handling.	10
Text Books: Textbook of Histopathology by Harsh Mohan		
Reference Books: - Theory and Practice of Histological Techniques by John D. Bancroft and Marilyn Gamble - Histotechnology: A Self-Instructional Text by Freida L. Carson and Christa Hladik Cappellano - Basic Histopathology: A Colour Atlas and Text by P. R. Wheater - Diagnostic Histopathology by Christopher D. M. Fletcher		

Name of the Course: Practical based on DSC-17/BMLT/T/401	
Course Type: Major (DSC)	Course Code: DSC-18/BMLT/P/402
Contact Hours : 60 Hrs	Credit: 02
Hours/Week: 04	Total Marks: 50
Practical:	
1.	Study of Laboratory Instruments-Microtome, tissue processor, embedding station, water bath, microscope
2.	Fixation of Tissue Samples-Use of fixatives (10% formalin)
3.	Dehydration, Clearing, and Infiltration (Demonstration)
4.	Embedding of Tissue in Paraffin Wax
5.	Preparation of Paraffin Blocks (Microtomy)
6.	Microtome Operation and Section Cutting-Ribbon formation and section thickness
7.	Mounting of Sections on Slides
8.	Hematoxylin and Eosin (H&E) Staining
9.	Special Staining Techniques (Demonstration)-PAS stain, Ziehl-Neelsen stain
10.	Mounting and Preservation of Stained Slides
11.	Identification of Normal Tissue Slides-Epithelial tissue, connective tissue, muscle tissue
12.	Identification of Basic Pathological Changes-Inflammation, necrosis (slide study)
13.	Study of Tumor Slides (Introductory)-Benign vs malignant (demonstration)
14.	Common Errors in Tissue Processing and Staining-Troubleshooting
15.	Laboratory Record Maintenance & Preparation of Histopathology Report (Basic Format)
Text Books:	
Textbook of Histopathology by Harsh Mohan	

Reference Books:

- Theory and Practice of Histological Techniques by John D. Bancroft and Marilyn Gamble
- Histotechnology: A Self-Instructional Text by Freida L. Carson and Christa Hladik Cappellano
- Basic Histopathology: A Colour Atlas and Text by P. R. Wheater
- Diagnostic Histopathology by Christopher D. M. Fletcher

Name of the Course: Hematology-II		
Course Type: Major (DSC)	Course Code: DSC-19/BMLT/T/403	
Contact Hours : 30 Hrs	Credit: 02	
Hours/Week: 02	Total Marks: 50	
Course Objectives: • To extend knowledge of hematology with emphasis on advanced diagnostic techniques. • To understand disorders of RBCs, WBCs, and platelets in detail. • To develop skills in interpretation of hematological parameters and blood smears. • To introduce coagulation disorders and advanced hemostasis testing. • To familiarize students with modern hematology instrumentation and quality assurance.		
Course Outcomes (COs) :		
After completion of the course, students will be able to - • Explain advanced concepts of hematopoiesis and blood cell disorders. • Interpret hematological parameters in various diseases. • Identify abnormal blood cells and hematological malignancies (introductory). • Understand coagulation mechanisms and related laboratory tests. • Apply quality control and automation in hematology laboratories.		
Module No.	Topics / actual contents of the syllabus	Contact Hours
I	Advanced Hematopoiesis & RBC Disorders-Review of hematopoiesis and regulation, Erythropoiesis and factors affecting RBC production, Anemias (Detailed Study): Classification: microcytic, macrocytic, normocytic, Iron deficiency anemia, Megaloblastic anemia, Hemolytic anemia (introductory), RBC Disorders: Hemoglobinopathies (sickle cell anemia, thalassemia – overview), RBC morphology in disease conditions, Reticulocyte count (principle and significance).	10

II	WBC Disorders & Hematological Malignancies- Leukopoiesis and its regulation, Leukocyte Disorders: Leukocytosis and leukopenia, Infectious conditions affecting WBCs, Leukemia (Introductory): Classification: acute and chronic leukemia, Basic features of leukemia (clinical and laboratory findings), Platelet Disorders: Thrombocytopenia and thrombocytosis, Platelet function disorders, Peripheral Blood & Bone Marrow Examination: Blood smear interpretation (advanced), Introduction to bone marrow examination (concept).	10
III	Hemostasis, Coagulation & Automation-Mechanism of hemostasis (primary and secondary), Coagulation cascade (intrinsic and extrinsic pathways), Coagulation Tests: Prothrombin Time (PT), Activated Partial Thromboplastin Time (aPTT), Bleeding Time (BT) and Clotting Time (CT) (review), Bleeding Disorders: Hemophilia, Disseminated Intravascular Coagulation (DIC) (introductory), Automation in Hematology: Automated hematology analyzers, Principles and advantages, Quality Assurance: Internal and external quality control, Calibration and standardization.	10

Text Books:

- The Textbook of Medical Laboratory Technology by Praful B. Godkar and Darshan P. Godkar

Reference Books:

- Dacie and Lewis Practical Haematology by Barbara J. Bain, Imelda Bates, and Mike A. Laffan
- Essentials of Hematology by A. V. Hoffbrand and J. E. Pettit
- Wintrobe's Clinical Hematology by Maxwell M. Wintrobe
- Hematology in Clinical Practice by Robert S. Hillman, Kenneth A. Ault, and Henry M. Rinder

Name of the Course: Practical based on DSC-19/BMLT/T/403	
Course Type: Major (DSC)	Course Code: DSC-20/BMLT/P/404
Contact Hours : 60 Hrs	Credit: 02
Hours/Week: 04	Total Marks: 50
Practical:	
1.	Reticulocyte Count-Supravital staining and calculation
2.	RBC Morphology Study (Advanced)-Identification of anisocytosis, poikilocytosis, target cells, sickle cells
3.	Estimation of Packed Cell Volume (PCV) – Microhematocrit Method
4.	Calculation and Interpretation of RBC Indices-MCV, MCH, MCHC using given data
5.	Hemoglobin Estimation (Advanced Method – Cyanmethemoglobin)
6.	Total and Differential Leukocyte Count (Advanced Interpretation)
7.	Platelet Count (Manual Method/Demonstration)
8.	Bleeding Time (BT) Determination- Duke's method (review) & Clotting Time (CT) Determination-Capillary method (review)
9.	Prothrombin Time (PT) (Demonstration) & Activated Partial Thromboplastin Time (aPTT) (Demonstration)
10.	Study of Automated Hematology Analyzer-Principle and parameters (demo/visit)
11.	Case-Based Hematological Analysis -Anemia, infection, leukemia cases
12.	Preparation of Hematology Report (Advanced)
Text Books:	
The Textbook of Medical Laboratory Technology by Praful B. Godkar and Darshan P. Godkar	
Reference Books:	
- Dacie and Lewis Practical Haematology by Barbara J. Bain, Imelda Bates, and Mike A. Laffan - Essentials of Hematology by A. V. Hoffbrand and J. E. Pettit	

Name of the Course: Clinical Biochemistry-II		
Course Type: Minor		Course Code: MN-3/BMLT/T/405
Contact Hours : 30 Hrs		Credit: 02
Hours/Week: 02		Total Marks: 50
Course Objectives: • To extend knowledge of clinical biochemistry with emphasis on advanced diagnostic parameters. • To understand biochemical alterations in diseases of major organs. • To develop skills in interpretation of biochemical test results. • To introduce modern analytical techniques and instrumentation. • To ensure quality control and accuracy in biochemical laboratories.		
Course Outcomes (COs) :		
After completion of the course, students will be able to - • Explain biochemical changes in disease conditions. • Interpret results of liver, kidney, and cardiac function tests. • Understand hormonal and electrolyte imbalances. • Apply principles of advanced biochemical techniques and instrumentation. • Maintain quality assurance and safety in clinical biochemistry labs.		
Module No.	Topics / actual contents of the syllabus	Contact Hours
I	Organ Function Tests-Liver Function Tests (LFTs): Bilirubin metabolism and estimation, Enzymes: AST (SGOT), ALT (SGPT), ALP, Serum proteins and albumin/globulin ratio, Clinical significance in liver diseases, Kidney Function Tests (KFTs): Urea, creatinine, uric acid estimation, Glomerular filtration rate (GFR) (concept), Electrolyte balance (Na ⁺ , K ⁺ , Cl ⁻), Cardiac Markers: CK-MB, Troponins (introductory), Clinical significance in myocardial infarction.	10

II	Endocrine & Metabolic Disorders-Carbohydrate Metabolism Disorders: Diabetes mellitus: types, diagnosis (glucose tolerance test – concept), Glycated hemoglobin (HbA1c), Lipid Profile: Cholesterol, triglycerides, HDL, LDL, Clinical significance in cardiovascular diseases, Hormonal Assays (Introductory): Thyroid function tests (T3, T4, TSH), Basic concepts of endocrine regulation, Electrolyte & Acid-Base Balance: Sodium, potassium, calcium balance, Acid-base disorders (overview).	10
III	Advanced Techniques, Instrumentation & Quality Control- Analytical Techniques: Colorimetry and spectrophotometry (review + advanced concepts), Enzyme assays and kinetics (introductory), Chromatography (basic concept – TLC, HPLC overview), Automation in Clinical Biochemistry: Semi-auto and fully automated analyzers, Advantages and limitations, Quality Assurance: Internal and external quality control Calibration and standardization, Laboratory errors and troubleshooting, Safety & Waste Management: Chemical hazards, Biomedical waste handling.	10
Text Books: Textbook of Medical Biochemistry by D. M. Vasudevan, S. Sreekumari, and Kannan Vaidyanathan		
Reference Books: - Clinical Chemistry: Principles and Techniques by Richard A. Harvey and Denise R. Ferrier - Tietz Fundamentals of Clinical Chemistry and Molecular Diagnostics by Nader Rifai, Andrea Horvath, and Carl T. Wittwer - Clinical Biochemistry is a medical textbook authored by U. Satyanarayana and U. Chakrapani		

Name of the Course: Practical based on MN-3/BMLT/T/405	
Course Type: Minor	Course Code: MN-4/BMLT/P/406
Contact Hours : 60 Hrs	Credit: 02
Hours/Week: 04	Total Marks: 50
Practical:	
1.	Estimation of Serum Bilirubin-Direct and total bilirubin
2.	Estimation of Serum Proteins-Total protein and albumin
3.	Estimation of Liver Enzymes (Demonstration)-AST (SGOT), ALT (SGPT), ALP
4.	Estimation of Blood Urea
5.	Estimation of Serum Creatinine
6.	Estimation of Uric Acid
7.	Estimation of Blood Glucose-Fasting/Postprandial & Glucose Tolerance Test (GTT) (Concept/Demo)
8.	Estimation of Serum Cholesterol & Estimation of Triglycerides (Demo)
9.	Estimation of Serum Electrolytes (Na ⁺ , K ⁺)
10.	(Demonstration) Estimation of Calcium (Demo)
11.	Cardiac Markers (Concept/Demo)-Troponin, CK-MB
12.	Case-Based Interpretation of Biochemical Reports-LFT, KFT, diabetes, lipid disorders & Preparation of Biochemistry Laboratory Report
Text Books:	
Textbook of Medical Biochemistry by D. M. Vasudevan, S. Sreekumari, and Kannan Vaidyanathan	
Reference Books:	
- Clinical Chemistry: Principles and Techniques by Richard A. Harvey and Denise R. Ferrier - Tietz Fundamentals of Clinical Chemistry and Molecular Diagnostics by Nader Rifai, Andrea Horvath, and Carl T. Wittwer - Clinical Biochemistry is a medical textbook authored by U. Satyanarayana and U. Chakrapani	

Name of the Course: Medical Ethics & Patient Care		
Course Type: GE/OE		Course Code: GE/OE-4/BMLT/407
Contact Hours : 30 Hrs		Credit: 02
Hours/Week: 02		Total Marks: 50
Course Objectives: • To introduce fundamental principles of medical ethics in healthcare. • To understand patient rights, responsibilities, and confidentiality. • To develop effective communication and patient care skills. • To promote ethical decision-making in laboratory and clinical settings. • To create awareness about legal and professional responsibilities of healthcare workers.		
Course Outcomes (COs) : After completion of the course, students will be able to - • Explain principles and importance of medical ethics. • Understand patient rights, consent, and confidentiality. • Demonstrate effective communication with patients and healthcare teams. • Apply ethical principles in clinical and laboratory practices. • Recognize legal responsibilities and professional conduct in healthcare.		
Module No.	Topics / actual contents of the syllabus	Contact Hours
I	Introduction to Medical Ethics-Definition, scope, and importance of medical ethics, Principles of medical ethics: Autonomy, Beneficence, Non-maleficence, Justice, Professional ethics in healthcare, Code of conduct for healthcare professionals, Ethical issues in medical laboratory practice.	10
II	Patient Care & Communication-Concept of patient care and patient-centered approach, Patient rights and responsibilities, Informed consent: types and importance, Confidentiality and privacy of patient information, Communication Skills: Verbal and non-verbal communication Communication with patients, relatives, and healthcare team	10

	Handling sensitive situations and breaking bad news (introductory), Patient Safety: Infection control and safety measures, Role of laboratory personnel in patient care	
III	Legal, Ethical Issues & Professional Practice-Legal aspects in healthcare: Medical negligence and malpractice Documentation and record keeping, Ethical issues in laboratory medicine: Sample handling and reporting, Errors and accountability, Biomedical waste management (overview) Ethics in research and clinical trials (basic concept), Role of regulatory bodies in healthcare, Professional Development: Teamwork and inter-professional collaboration, Professional behavior and attitude, Case studies in medical ethics.	10
Text Books: Textbook of Medical Ethics and Jurisprudence by N. R. Madhava Menon		
Reference Books: - Medical Ethics by C. M. Francis, R. K. Mathiharan, and K. S. Sreenivasan - Principles of Biomedical Ethics by philosophers Tom L. Beauchamp and James F. Childress - Bioethics by Udo Schüklenk		

Name of the Course: Parasitology & Mycology		
Course Type: SEC		Course Code: SEC-3/BMLT/T/408
Contact Hours : 15 Hrs		Credit: 01
Hours/Week: 02		Total Marks: 50
Course Objectives: • To introduce the fundamentals of medical parasitology and mycology. • To understand morphology, life cycles, and classification of parasites and fungi. • To develop skills in identification of clinically important parasites and fungi. • To familiarize students with laboratory diagnostic techniques. • To promote awareness of prevention and control of parasitic and fungal infections.		
Course Outcomes (COs) : After completion of the course, students will be able to - • Explain basic concepts and classification of parasites and fungi. • Describe morphology and life cycles of important parasites. • Identify common fungal organisms and related infections. • Apply laboratory diagnostic techniques in parasitology and mycology. • Understand prevention and control measures of infections.		
Module No.	Topics / actual contents of the syllabus	Contact Hours
I	Medical Parasitology-Introduction, scope, and classification of parasites, Host-parasite relationship, Protozoa: Morphology, life cycle, and laboratory diagnosis of: <i>Entamoeba histolytica</i> , <i>Plasmodium</i> spp. (malaria parasite), <i>Giardia lamblia</i> , Helminths: Classification: nematodes, cestodes, trematodes, Morphology and life cycle (overview) of: <i>Ascaris lumbricoides</i> , <i>Taenia</i> spp., <i>Ancylostoma duodenale</i> , Laboratory Diagnosis: Collection and examination of stool samples, Direct microscopy and concentration techniques, Blood smear examination for malaria Prevention & Control: Personal hygiene and sanitation, Vector control (introductory).	08

II	Medical Mycology-Introduction and classification of fungi, Morphology: yeast, mould, dimorphic fungi, Medically Important Fungi: <i>Candida</i> spp., <i>Aspergillus</i> spp., <i>Dermatophytes</i> (e.g., <i>Trichophyton</i>), Fungal Infections (Overview): Superficial, subcutaneous, and systemic mycoses, Laboratory Diagnosis: Specimen collection (skin, nail, hair, sputum), KOH mount preparation, Culture techniques (introductory), Antifungal Agents (Basic Concept)-Overview of antifungal drugs, Biosafety & Prevention: Laboratory safety Infection control practices.	07
Text Books: • Textbook of Parasitology by K. D. Chatterjee		
Reference Books: • Medical Laboratory Technology by Praful B. Godkar and Darshan P. Godkar • Medical Parasitology by D. R. Arora and Brij Bala Arora • Medical Mycology by K. J. Kwon-Chung and J. E. Bennett • Medical Microbiology by David Greenwood, Richard Slack, and John Peutherer		

Name of the Course: Practical based on SEC-3/BMLT/T/408	
Course Type: SEC	Course Code: SEC-4/BMLT/P/409
Contact Hours : 30 Hrs	Credit: 01
Hours/Week: 02	Total Marks: 50
Practical:	
1.	Collection and Processing of Stool Samples
2.	Direct Wet Mount Examination-Saline and iodine preparation
3.	Identification of Protozoa (Slide Study)-Entamoeba histolytica, Giardia lamblia
4.	Identification of Helminth Eggs (Slide Study)-Ascaris lumbricoides, Taenia spp., Ancylostoma
5.	Peripheral Blood Smear for Malaria (Demonstration)
6.	Specimen Collection for Fungal Infections-Skin, nail, hair samples
7.	KOH Mount Preparation -Detection of fungal elements
8.	Lactophenol Cotton Blue (LPCB) Mount (Demonstration)
9.	Identification of Fungi (Slide/Culture Study)-Candida, Aspergillus, dermatophytes
10.	Culture Techniques (Demonstration)-Sabouraud dextrose agar (SDA)
11.	Identification of Parasitic and Fungal Specimens
12.	Recording and Reporting of Results
Text Books:	
Textbook of Parasitology by K. D. Chatterjee	
Reference Books:	
- Medical Laboratory Technology by Praful B. Godkar and Darshan P. Godkar - Medical Parasitology by D. R. Arora and Brij Bala Arora - Medical Mycology by K. J. Kwon-Chung and J. E. Bennett - Medical Microbiology by David Greenwood, Richard Slack, and John Peutherer	

Name of the Course: English for All-II (Common for all faculty)	
Course Type: AEC	Course Code: AEC-4/ENG/T/410
Contact Hours : 30 Hrs	Credit: 02
Hours/Week: 02	Total Marks: 50
(Syllabus of above course is available on respective BOS or College Website)	

Name of the Course: Field Project	
Course Type: FP	Course Code: FP-1/BBT/P/411
Contact Hours : 60 Hrs	Credit: 02
Hours/Week: 04	Total Marks: 50
• Field project work / Thesis / Dissertation shall be carried out under the supervision of a teacher in the Department (In house/On site). • Field project work / Thesis / Dissertation shall be pursued for a minimum of 04 weeks during the semester, following the preliminary plan of work carried out in the semester. • The Field project Report / Thesis / Dissertation report is to be prepared as per standard scientific research methodology and duly signed by the supervisor(s) and the Head of the Department shall be submitted to the concerned department. • The assessment (Internal and external) of the field project work will be as per Deogiri College (Autonomous) guidelines.	

Co-Curricular Courses (CC-4)

(Choose any one subject as a CC-4 from following pool of subjects)

Course Type: CC	Credit: 02
Contact Hours : 60 Hrs	Total Marks: 50
Hours/Week: 04	
Course Code:	Name of the Course
CC-4/PHYE/T/412	Health & Wellness
CC-4/YOG/T/412	Yoga Education
CC-4/NSS/T/412	NSS
CC-4/NCC/T/412	NCC
CC-4/CUL/T/412	Cultural Activity
(Syllabus of above course is available on respective BOS or College Website)	

Curriculum
B.Sc. Medical Laboratory
Technology (BMLT)
T.Y. Semester-V

(Apprenticeship Module)

Course Type	Course Code	Course Name	Teaching Scheme (Hrs / Week)		Credits Assigned		Total Credits
			Theory	Pract	Theory	Pract	
Major (Core) Mandatory	DSC- 21/BMLT/P/501	Apprenticeship-I	-	30	-	22	22
Total Hrs. of Semester-V apprenticeship =720 Hrs.							

Sem-V Apprenticeship Modules Credit Distribution (22 Credits)

Module No.	Topics Covered	Credits
1	Orientation to Pathology Laboratory: Safety protocols, standard operating procedures (SOPs), biomedical waste management, record-keeping practices	2
2	Hematology: Sample collection techniques, complete blood count (CBC), ESR, peripheral smear preparation, blood grouping, cross-matching	4
3	Clinical Biochemistry: Specimen collection, tests for glucose, lipids, liver and renal function tests, electrolytes, quality control	4
4	Clinical Pathology: Urinalysis, stool examination, CSF and body fluid analysis, basic interpretation of results	3
5	Histopathology and Cytology: Tissue processing, section cutting, H&E staining, basics of cytological examination	3
6	Microbiology Basics: Collection and transport of specimens, culture methods, Gram staining, antibiotic susceptibility testing	3
7	Professional Skills: Effective communication, basic laboratory informatics, ethical practices, patient data confidentiality	3

Curriculum
B.Sc. Medical Laboratory
Technology (BMLT)
T.Y. Semester-VI

(Advanced Apprenticeship Module)

Course Type	Course Code	Course Name	Teaching Scheme (Hrs / Week)		Credits Assigned		Total Credits
			Theory	Pract	Theory	Pract	
Major (Core) Mandatory	DSC- 22/BMLT/P/ 601	Apprenticeship-II	-	30	-	22	22
Total Hrs. of Semester-VI apprenticeship =720 Hrs.							
Exit option : Award of UG degree in Major with 132 credits							

Sem-VI Advanced Apprenticeship Modules Credit Distribution (22 Credits)

Module No.	Topics Covered	Credits
1	Advanced Hematology: Coagulation profile (PT, aPTT), bone marrow aspirations, advanced cell morphology	3
2	Advanced Biochemistry: Automation in clinical biochemistry, troubleshooting equipment, advanced test panels	4
3	Immunology and Serology: ELISA, immunofluorescence, rapid immunoassays, result interpretation	3
4	Advanced Microbiology: Mycology, parasitology, molecular diagnostics (PCR basics), biosafety protocols for infectious samples	4
5	Laboratory Management & Quality Assurance: Equipment calibration, quality control (internal and external), documentation and reporting	4
6	Professional Development: Advanced communication skills, teamwork in healthcare, ethics, data analysis and laboratory reporting	4

Common Apprenticeship Guidelines for Students (Sem-V & Sem-VI)

1. Purpose of Apprenticeship

- To provide hands-on training in real clinical laboratory settings.
- To bridge the gap between theoretical knowledge and practical application.
- To enhance employability, professional skills, and work ethics.
- To expose students to advanced diagnostic techniques and instrumentation

2. Conducted in approved hospitals, diagnostic laboratories, or research centers

Preferably NABL-accredited labs / reputed hospitals (MoU)

3. Expected Learning Outcomes

Students will be able to:

- Apply laboratory techniques in real clinical settings
- Handle biological samples safely and ethically
- Interpret diagnostic results accurately
- Demonstrate professional behavior and communication skills
- Understand quality standards (NABL, ISO)

4. Student Activities during Apprenticeship

- Daily laboratory work participation
- Maintenance of logbook/record diary
- Case study documentation
- Observation of advanced instruments
- Participation in quality control procedures

5. Logbook Guidelines

- Students must maintain a certified logbook including:
- Daily activities performed
- Techniques observed/performed
- Instruments used
- Case summaries
- Supervisor's remarks and signature

6. Institutional Responsibilities

- Provide placement support for students
- Ensure training at recognized laboratories
- Assign a faculty coordinator
- Monitor student progress and attendance

7. Host Organization Responsibilities

- Provide structured training schedule
- Assign a qualified lab supervisor/mentor
- Ensure safety and ethical practices
- Evaluate student performance

8. Code of Conduct for Students

- Maintain discipline and punctuality
- Follow laboratory safety protocols
- Maintain confidentiality of patient data
- Wear proper PPE and uniform
- Respect workplace ethics and hierarchy

9. Documentation Required

- Joining letter / permission letter
- Attendance certificate
- Completion certificate
- Evaluation report from supervisor
