

Babu Banarasi Das University, Lucknow
School of Allied Health Sciences
School Code: 13
University Branch Code: 15
Evaluation Scheme (w.e.f. – 2025-26)

BACHELOR OF SCIENCE (HONORS) (MEDICAL LABORATORY TECHNOLOGY)

SETS

	COURSE CODE	COURSE NAME	COURSE TYPE	Periods			Total Credits	Evaluation Scheme		
				L	T	P		CIA	ESE	Subject Total
SET 1	BML 101T	Fundamentals of Medical Lab Technology	DSC	3	1	0	4	40	60	100
	BML 102T	Vital Signs and Management of Medical Emergencies	DSC	2	0	0	2	40	60	100
	BML 103T	Healthcare Delivery System	MD	2	1	0	3	40	60	100
	BML 104T	Digital Literacy	AEC	2	0	0	2	60	40	100
	BML 105T	Communicative English	SEC	2	1	0	3	60	40	100
	BML 106T	Environment and Ecological Sustainability	VAC	2	1	0	3	40	60	100
	BML 101P	Fundamentals of Medical Lab Technology Lab	DSC	0	0	6	3	60	40	100
	BML 102P	Vital Signs and Management of Medical Emergencies Lab	DSC	0	0	4	2	60	40	100
		Total		13	4	10	22	400	400	800

	COURSE CODE	COURSE NAME	COURSE TYPE	Periods			Total Credits	Evaluation Scheme		
				L	T	P		CIA	ESE	Subject Total
SET 2	BML 201T	Basic Medical Lab Techniques and Blood Banking	DSC	3	1	0	4	40	60	100
	BML 202T	Infection Control and Biomedical Waste Management	DSC	2	0	0	2	40	60	100
	BML 203T	Hospital Services	MD	2	1	0	3	40	60	100
	BML 204T	Business Communication	AEC	2	1	0	3	60	40	100
	BML 205T	Job Ready Skills I	SEC	2	0	0	2	60	40	100
	BML 206T	AI Tools	VAC	2	1	0	3	40	60	100
	BML 201P	Basic Medical Lab Techniques and Blood Banking Lab	DSC	0	0	6	3	60	40	100
	BML 202P	Infection Control and Biomedical Waste Management Lab	DSC	0	0	4	2	60	40	100
	Total			13	4	10	22	400	400	800

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	COURSE CODE	COURSE NAME	COURSE TYPE	Periods			Total Credits	Evaluation Scheme		
				L	T	P		CIA	ESE	Subject Total
SET 3	BML 301T	Advanced Medical Lab Techniques and Blood Banking	DSC	3	1	0	4	40	60	100
	BML 302T	Laboratory Management and Information System	DSC	2	1	0	3	40	60	100
	BML 303T	Medical Law and Ethics	MD	2	1	0	3	40	60	100
	BML 304T	Sales and Marketing	AEC	2	1	0	3	60	40	100
	BML 305T	Job Ready Skills II	SEC	2	0	0	2	60	40	100
	BML 301P	Advanced Medical Lab Techniques and Blood Banking Lab	DSC	0	0	8	4	60	40	100
	BML 302P	Laboratory Management and Information System Lab	DSC	0	0	6	3	60	40	100
		Total		11	4	14	22	360	340	700

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SET 4	COURSE CODE	COURSE NAME	COURSE TYPE	Periods			Total Credits	Evaluation Scheme		
				L	T	P		CIA	ESE	Subject Total
	BML 401T	Molecular Biology and Cytogenetics	DSC	3	1	0	4	40	60	100
	BML 402T	Cancer Diagnostics	DSC	3	1	0	4	40	60	100
	BML 403T	Advanced Histopathology	DSC	2	2	0	4	40	60	100
	BML 404T	Advanced Cytopathology	DSC	2	0	0	2	40	60	100
	BML 405T	Leadership Skills for Business Success	AEC	2	0	0	2	60	40	100
	BML 401P	Molecular Biology and Cytogenetics Lab	DSC	0	0	8	4	60	40	100
	BML 402P	Advanced Cytopathology Lab	DSC	0	0	4	2	60	40	100
	Total			12	4	12	22	340	360	700

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SET 5	COURSE CODE	COURSE NAME	COURSE TYPE	Periods			Total Credits	Evaluation Scheme		
				L	T	P		CIA	ESE	Subject Total
	BML 501P	Phlebotomy Techniques	DSC	0	0	24	12	60	40	100
	BML 502P	Managing Medical Emergencies	DSC	0	0	12	6	60	40	100
BML 503P	Summer Internship	SI	0	0	4	2	60	40	100	
	Total			0	0	40	20	180	120	300

SET 6	COURSE CODE	COURSE NAME	COURSE TYPE	Periods			Total Credits	Evaluation Scheme		
				L	T	P		CIA	ESE	Subject Total
	BML 601P	Infection Control Practices	DSC	0	0	24	12	60	40	100
	BML 602P	Haematology Laboratory Techniques	DSC	0	0	12	6	60	40	100
	BML 603P	Internship	SEC	0	0	4	2	60	40	100
				0	0	40	20	180	120	300

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SET 7	COURSE CODE	COURSE NAME	COURSE TYPE	Periods			Total Credits	Evaluation Scheme		
				L	T	P		CIA	ESE	Subject Total
	BML 701P	Blood Banking Procedures	DSC	0	0	24	12	60	40	100
	BML 702P	Clinical Pathology	DSC	0	0	16	8	60	40	100
		Total		0	0	40	20	120	80	200

SET 8	COURSE CODE	COURSE NAME	COURSE TYPE	Periods			Total Credits	Evaluation Scheme		
				L	T	P		CIA	ESE	Subject Total
	BML 801P	Laboratory Management	DSC	0	0	16	8	60	40	100
	BML 802P	Clinical Biochemistry	DSC/RP	0	0	8	4	60	40	100
	BML 803P	Immunology and Serology Procedures	DSC/RP	0	0	8	4	60	40	100
	BML 804P	Microbiology Techniques	DSC/RP	0	0	8	4	60	40	100
		Total		0	0	40	20	240	160	400

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LEVEL 6 (B.Sc. (Hons))

1st Classroom Semester- Set 1
2nd Classroom Semester- Set 2
3rd Classroom Semester- Set 3
4th Classroom Semester- Set 4

1st Internship Semester- Set 5
2nd Internship Semester- Set 6
3rd Internship Semester- Set 7
4th Internship Semester- Set 8

LEVEL 5 (Diploma)

1st Classroom Semester- Set 1
2nd Classroom Semester- Set 2

1st Internship Semester- Set 5
2nd Internship Semester- Set 6

LEVEL 5.5 (B.Sc.)

1st Classroom Semester- Set 1
2nd Classroom Semester- Set 2
3rd Classroom Semester- Set 3

1st Internship Semester- Set 5
2nd Internship Semester- Set 6
3rd Internship Semester- Set 7

LEVEL 4.5 (Certificate)

1st Classroom Semester- Set 1

1st Internship Semester- Set 5

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BACHELOR OF SCIENCE (HONORS) (MEDICAL LABORATORY TECHNOLOGY)

Students choosing the level 4.5 exit will study set 1 in semester I and set 5 in semester II

	COURSE CODE	COURSE NAME	COURSE TYPE	CREDITS				Evaluation Scheme--		
				L	T	P	Total	CIA	ESE	Subject Total
SEMESTER-I (The student will study set 1)	BML 101T	Fundamentals of Medical Lab Technology	DSC	3	1	0	4	40	60	100
	BML 102T	Vital Signs and Management of Medical Emergencies	DSC	2	0	0	2	40	60	100
	BML 103T	Healthcare Delivery System	MD	2	1	0	3	40	60	100
	BML 104T	Digital Literacy	AEC	2	0	0	2	60	40	100
	BML 105T	Communicative English	SEC	2	1	0	3	60	40	100
	BML 106T	Environment and Ecological Sustainability	VAC	2	1	0	3	40	60	100
	BML 101P	Fundamentals of Medical Lab Technology Lab	DSC	0	0	6	3	60	40	100
	BML 102P	Vital Signs and Management of Medical Emergencies Lab	DSC	0	0	4	2	60	40	100
		Total		13	4	10	22	400	400	800

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1. An exit request for UG certificate can be raised maximum before the start of Semester II. In case a student raises a request for exit after the start of Semester II, they can only opt for the next available exit stage i.e. 2 year UG Diploma.
2. If a student does not wish to either opt for the next available exit stage or continue with the course, no certification will be provided to the student.
3. Students have to pass all the previous exams in order to be eligible for the internship semester.
4. In case a student fails in any of the exams in any semester, s/he will get another chance to reappear in the next end semester exam.
5. If a student wants to exit for a UG Certificate, after Semester I, then s/he has to complete the required credits in the internship semesters as given below.

SEMESTER - II (Student will study set 5)	COURSE CODE	COURSE NAME	COURSE TYPE	CREDITS				Evaluation Scheme--		
				L	T	P	Total	CIA	ESE	Subject Total
	BML 501P	Phlebotomy Techniques	DSC	0	0	24	12	60	40	100
	BML 502P	Managing Medical Emergencies	DSC	0	0	12	6	60	40	100
	BML 503P	Summer Internship	SI	0	0	4	2	60	40	100
				0	0	40	20	180	120	300

Students exiting the programme after securing 40 credits will be awarded a UG Certificate (Medical Laboratory Technology), provided they secure 4 credits in work-based vocational courses offered during the summer term or an internship / Apprenticeship in addition to 6 credits from skill-based courses earned during the first and second semester.

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Students choosing the level 5 exit will study set 1 in semester I, set 2 in semester II, set 5 in semester III, and set 6 in semester IV

If a student wants to continue after Semester I, then this SET will be followed for Semester II.

	COURSE CODE	COURSE NAME	COURSE TYPE	CREDITS				Evaluation Scheme--		
				L	T	P	Total	CIA	ESE	Subject Total
SEMESTER - II (Student will study set 2)	BML 201T	Basic Medical Lab Techniques and Blood Banking	DSC	3	1	0	4	40	60	100
	BML 202T	Infection Control and Biomedical Waste Management	DSC	2	0	0	2	40	60	100
	BML 203T	Hospital Services	MD	2	1	0	3	40	60	100
	BML 204T	Business Communication	AEC	2	1	0	3	60	40	100
	BML 205T	Job Ready Skills I	SEC	2	0	0	2	60	40	100
	BML 206T	AI Tools	VAC	2	1	0	3	40	60	100
	BML 201P	Basic Medical Lab Techniques and Blood Banking Lab	DSC	0	0	6	3	60	40	100
	BML 202P	Infection Control and Biomedical Waste Management Lab	DSC	0	0	4	2	60	40	100
				13	4	10	22	400	400	800

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1. An exit request for a UG diploma can be raised maximum before the start of Semester III. In case a student raises a request for exit after the start of Semester III, they can only opt for the next available exit stage i.e. 3 year UG Degree.
2. If a student does not wish to either opt for the next available exit stage or continue with the course, no certification will be provided to the student.
3. Students have to pass all the previous exams in order to be eligible for the internship semester.
4. In case a student fails in any of the exams in any semester, s/he will get another chance to reappear in the next end semester exam.
5. If a student wants to exit for a UG Diploma after Semester II, then s/he has to complete the required credits in the internship semesters as given below.

SEMESTER-III (Student will study set 5)	COURSE CODE	COURSE NAME	COURSE TYPE	CREDITS				Evaluation Scheme--		
				L	T	P	Total	CIA	ESE	Subject Total
	BML 501P	Phlebotomy Techniques	DSC	0	0	24	12	60	40	100
	BML 502P	Managing Medical Emergencies	DSC	0	0	12	6	60	40	100
	BML 503P	Summer Internship	SI	0	0	4	2	60	40	100
				0	0	40	20	180	120	300

SEMESTER-IV (Student will study set 6)	COURSE CODE	COURSE NAME	COURSE TYPE	CREDITS				Evaluation Scheme--		
				L	T	P	Total	CIA	ESE	Subject Total
	BML 601P	Infection Control Practices	DSC	0	0	24	12	60	40	100
	BML 602P	Haematology Laboratory Techniques	DSC	0	0	12	6	60	40	100
	BML 603P	Internship	SEC	0	0	4	2	60	40	100
				0	0	40	20	180	120	300

Students exiting the programme after securing 80 credits will be awarded a UG Diploma (Medical Laboratory Technology), provided they secure an additional 4 credits in skill-based vocational courses offered during the first year or second year summer term. If a student wants to continue after Semester II, then this SET will be followed for Semester III.

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Students choosing the level 5.5 exit will study set 1 in semester 1, set 2 in semester II, set 3 in semester III, set 5 in semester IV, set 6 in semester V, and set 7 in semester VI
If a student wants to continue after Semester II, then this SET will be followed for Semester III.

	COURSE CODE	COURSE NAME	COURSE TYPE	CREDITS				Evaluation Scheme--		
				L	T	P	Total	CIA	ESE	Subject Total
SEMESTER-III (Student will study set 3)	BML 301T	Advanced Medical Lab Techniques and Blood Banking	DSC	3	1	0	4	40	60	100
	BML 302T	Laboratory Management and Information System	DSC	2	1	0	3	40	60	100
	BML 303T	Medical Law and Ethics	MD	2	1	0	3	40	60	100
	BML 304T	Sales and Marketing	AEC	2	1	0	3	60	40	100
	BML 305T	Job Ready Skills II	SEC	2	0	0	2	60	40	100
	BML 301P	Advanced Medical Lab Techniques and Blood Banking Lab	DSC	0	0	8	4	60	40	100
	BML 302P	Laboratory Management and Information System Lab	DSC	0	0	6	3	60	40	100
				11	4	14	22	360	340	700

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1. An exit request for 3 year UG degree can be raised maximum before the start of Semester IV. In case a student raises a request for exit after the start of Semester IV, they can only opt for the next available exit stage i.e. 4 year UG degree with honors.
2. If a student does not wish to either opt for the next available exit stage or continue with the course, no certification will be provided to the student.
3. Students have to pass all the previous exams in order to be eligible for the internship semester.
4. In case a student fails in any of the exams in any semester, s/he will get another chance to reappear in the next end semester exam.
5. If a student wants to exit for a 3 year UG Degree, after Semester III, then s/he has to complete the required credits in the internship semesters as given below.

SEMESTER-IV (Student will study set 5)	COURSE CODE	COURSE NAME	COURSE TYPE	CREDITS				Evaluation Scheme--		
				L	T	P	Total	CIA	ESE	Subject Total
	BML 501P	Phlebotomy Techniques	DSC	0	0	24	12	60	40	100
	BML 502P	Managing Medical Emergencies	DSC	0	0	12	6	60	40	100
	BML 503P	Summer Internship	SI	0	0	4	2	60	40	100
				0	0	40	20	180	120	300

SEMESTER-V (Student will study set 6)	COURSE CODE	COURSE NAME	COURSE TYPE	CREDITS				Evaluation Scheme--		
				L	T	P	Total	CIA	ESE	Subject Total
	BML 601P	Infection Control Practices	DSC	0	0	24	12	60	40	100
	BML 602P	Haematology Laboratory Techniques	DSC	0	0	12	6	60	40	100
	BML 603P	Internship	SEC	0	0	4	2	60	40	100
				0	0	40	20	180	120	300

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SEMESTER-VI (Student will study set 7)	COURSE CODE	COURSE NAME	COURSE TYPE	CREDITS				Evaluation Scheme--		
				L	T	P	Total	CIA	ESE	Subject Total
	BML 701P	Blood Banking Procedures	DSC	0	0	24	12	60	40	100
	BML 702P	Clinical Pathology	DSC	0	0	16	8	60	40	100
				0	0	40	20	120	80	200

Students who want to undertake a 3-year UG programme will be awarded a Bachelor of Science (Medical Laboratory Technology) degree upon securing 120 credits

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Students choosing the level 6 exit will study set 1 in semester I, set 2 in semester II, set 3 in semester III, set 4 in semester IV, set 5 in semester V, set 6 in semester VI, set 7 in semester VII, and set 8 in semester VIII

If a student wants to continue after Semester III, then this SET will be followed for the remaining semesters.

	COURSE CODE	COURSE NAME	COURSE TYPE	CREDITS				Evaluation Scheme--		
				L	T	P	Total	CIA	ESE	Subject Total
SEMESTER-IV (Student will study set 4)	BML 401T	Molecular Biology and Cytogenetics	DSC	3	1	0	4	40	60	100
	BML 402T	Cancer Diagnostics	DSC	3	1	0	4	40	60	100
	BML 403T	Advanced Histopathology	DSC	2	2	0	4	40	60	100
	BML 404T	Advanced Cytopathology	DSC	2	0	0	2	40	60	100
	BML 405T	Leadership Skills for Business Success	AEC	2	0	0	2	60	40	100
	BML 401P	Molecular Biology and Cytogenetics Lab	DSC	0	0	8	4	60	40	100
	BML 402P	Advanced Cytopathology Lab	DSC	0	0	4	2	60	40	100
				12	4	12	22	340	360	700

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1. Students have to pass all the previous exams in order to be eligible for the internship semester.
2. In case a student fails in any of the exams in any semester, s/he will get another chance to reappear in the next end semester exam.

SEMESTER-V (Student will study set 5)	COURSE CODE	COURSE NAME	COURSE TYPE	CREDITS				Evaluation Scheme--		
				L	T	P	Total	CIA	ESE	Subject Total
	BML 501P	Phlebotomy Techniques	DSC	0	0	24	12	60	40	100
	BML 502P	Managing Medical Emergencies	DSC	0	0	12	6	60	40	100
	BML 503P	Summer Internship	SI	0	0	4	2	60	40	100
				0	0	40	20	180	120	300

SEMESTER-VI (Student will study set 6)	COURSE CODE	COURSE NAME	COURSE TYPE	CREDITS				Evaluation Scheme--		
				L	T	P	Total	CIA	ESE	Subject Total
	BML 601P	Infection Control Practices	DSC	0	0	24	12	60	40	100
	BML 602P	Haematology Laboratory Techniques	DSC	0	0	12	6	60	40	100
	BML 603P	Internship	SEC	0	0	4	2	60	40	100
				0	0	40	20	180	120	300

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SEMESTER-VII (Student will study set 7)	COURSE CODE	COURSE NAME	COURSE TYPE	CREDITS				Evaluation Scheme--		
				L	T	P	Total	CIA	ESE	Subject Total
	BML 701P	Blood Banking Procedures	DSC	0	0	24	12	60	40	100
	BML 702P	Clinical Pathology	DSC	0	0	16	8	60	40	100
				0	0	40	20	120	80	200

SEMESTER-VIII (The student will study set 8)	COURSE CODE	COURSE NAME	COURSE TYPE	CREDITS				Evaluation Scheme--		
				L	T	P	Total	CIA	ESE	Subject Total
	BML 801P	Laboratory Management	DSC	0	0	16	8	60	40	100
	BML 802P	Clinical Biochemistry	DSC/RP	0	0	8	4	60	40	100
	BML 803P	Immunology and Serology Procedures	DSC/RP	0	0	8	4	60	40	100
	BML 804P	Microbiology Techniques	DSC/RP	0	0	8	4	60	40	100
				0	0	40	20	240	160	400

Students will be awarded a Bachelor of Science (Honors) (Medical Laboratory Technology) degree provided they secure 160 credits

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Course Type Abbreviations:

DSC: Discipline Specific Core/Major Courses

MD: Multi-Disciplinary Courses

AEC: Ability Enhancement Courses

SEC: Skill Enhancement Courses

VAC: Common Values Added Courses

SI: Summer Internship

RP: Research Project

CIA: Continuous Internal Assessment

ESE: End Semester Examination

L: Lecture

T: Tutorial

P: Practical



Babu Banarasi Das University, Lucknow
School of Allied Health Sciences
School Code: 13
University Branch Code: 15
Evaluation Scheme (w.e.f. – 2025-26)

PROGRAM OUTCOMES

- PO1: Perform laboratory procedures in hematology, microbiology, biochemistry, pathology, immunology, and serology, ensuring accuracy and adherence to quality standards
- PO2: Accurately collect, label, transport, handle, and process a variety of clinical specimens, ensuring sample integrity and patient safety.
- PO3: Analyze clinical samples, interpret laboratory findings, and correlate results with disease processes to assist in diagnosis and patient management
- PO4: Follow biosafety guidelines, biomedical waste management, and infection control practices to ensure a safe laboratory environment
- PO5: Competently handle, calibrate, and maintain laboratory instruments and diagnostic equipment as per standard operating procedures
- PO6: Implement and monitor quality control measures to ensure the reliability and validity of laboratory results
- PO7: Record, manage, and report laboratory data with precision, maintaining confidentiality and compliance with regulatory requirements
- PO8: Exhibit integrity, responsibility, and ethical behavior in all laboratory and clinical settings, respecting patient rights and professional values
- PO9: Work effectively with clinicians, pathologists, and other healthcare professionals in diagnostic decision-making and patient care
- PO10: Participate in research, stay updated with technological advancements, and pursue continuous professional development in laboratory sciences
- PO11: Use analytical reasoning to identify procedural errors, troubleshoot instrument malfunctions, and resolve laboratory challenges
- PO12: Demonstrate clear written and oral communication skills for reporting results, discussing findings, and educating patients or peers



PROGRAM SPECIFIC OUTCOMES

PSO1: Accurately collect, label, transport, process, and analyze a wide range of clinical specimens, utilizing advanced diagnostic techniques in hematology, biochemistry, microbiology, and immunology laboratories.

PSO2: Interpret laboratory data and effectively assist clinicians and pathologists in evidence-based diagnosis, treatment planning, and patient monitoring.



Program	B.Sc. (Hons) MLT				
Year	I	Semester	I		
Course Name	Fundamentals of Medical Lab Technology				
Code	BML 101T				
Course Type	DSC	L	T	P	Credit
Pre-Requisite		3	1	0	4
Course Objectives	Understand the anatomical planes and positions used to describe the human body, and learn the foundational structure and usage of medical terminology including prefixes, suffixes, abbreviations, and directional terms. Explore the basics of human anatomy and physiology Identify the roles and responsibilities of a phlebotomist, and understand essential skills, ethical guidelines (GCLP), and practices involved in both fixed and mobile phlebotomy services. Familiarize with the structure and operations of medical laboratories, including types of labs, required infrastructure, roles of lab personnel, and applicable regulatory frameworks..				
Course Outcomes					
CO1	Describe human body structures using anatomical planes, positions, and appropriate medical terminology.				
CO2	Explain the structure and functions of cells, tissues, organs, and organ systems, and explain their interrelationships and roles in maintaining homeostasis and overall health.				
CO3	Describe the roles, skills, and guidelines (e.g., GCLP) essential for phlebotomists, including mobile phlebotomy practices, in delivering effective patient care.				
CO4	Understand the infrastructure, personnel types, and regulatory standards governing medical laboratories to ensure compliance and quality in healthcare services.				

Module	Course Contents	Contact Hrs.	Mapped CO
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1	Anatomical Planes, Anatomical Positions and Medical Terminology: Sagittal plane, Frontal plane, Transverse plane, Supine position, Prone position, Parts of medical terminology, Rules for constructing and interpreting medical terms, Terminology related to body parts, Regional terms of the human body, Directional terms, Abbreviations & symbols, Prefixes, Suffixes	15 Hours	CO1
2	Anatomy and Physiology: Cell, Tissue, Organ, Organ system, Digestive system, Respiratory system, Integumentary system, Circulatory system, Lymphatic System, Muscular system, Skeletal System, Urinary System, Reproductive System - Male and female, Endocrine system, Nervous System, Body fluids	15 Hours	CO2
3	Phlebotomy: Roles of phlebotomists in healthcare, Phlebotomist skills, GCLP guidelines, Mobile phlebotomy	15 Hours	CO3
4	Medical Lab Technology: Laboratory types, Types of personnel, Infrastructure, Regulatory agency	15 Hours	CO4

Suggested Readings

1. Davi-Ellen Chabner, Medical Terminology: A Short Course, Saunders, 2017
2. Barbara Janson Cohen, Shirley A Jone, Medical Terminology an Illustrated Guide, Ninth edition
3. G Deepa, PR Ashalatha, Textbook of Applied Anatomy and Physiology for Nurses, Jaypee Brothers Medical Publishers
4. B.D. Chaurasia, Applied Anatomy and Physiology for BSc Nursing Students, CBS Publishers & Distributors Pvt. Ltd.
5. Darshan P. Godkar, Praful B. Godkar, Textbook of Medical Laboratory Technology (Set of 2 Volumes) - Clinical Laboratory Science and Molecular Diagnosis
6. Ramnik Sood, Medical Laboratory Technology (2 Vols. Set) By Ramnik Sood, Edition: 6th, Jaypee Brothers Medical Publishers (P) Ltd

Online Resources

1. <https://www.ncbi.nlm.nih.gov/books/NBK607454/>
2. <https://www.ascp.org>
3. <https://clsi.org>
4. <https://www.cdc.gov/labtraining/index.html>

Course Articulation Matrix														
PO-PSO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	2	-	-	-	-	-	-	-	-	-	-	2	-	-

CO2	2	-	2	-	-	-	-	-	-	-	-	1	-	-
CO3	1	3	1	2	-	2	1	2	2	-	-	2	2	1
CO4	1	1	1	2	2	3	2	2	1	2	2	1	2	2

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Program	B.Sc. (Hons) MLT				
Year	I	Semester		I	
Course Name	Vital Signs and Management of Medical Emergencies				
Code	BML 102T				
Course Type	DSC	L	T	P	Credit
Pre-Requisite		2	0	0	2
Course Objectives	Explain the concept, types, and normal ranges of vital signs, and demonstrate accurate measurement and interpretation using appropriate clinical methods and equipment. Describe and apply the step-by-step process of administering Cardiopulmonary Resuscitation (CPR) in adults and children, and manage choking incidents effectively through risk identification and appropriate first aid techniques. Provide appropriate first aid for common medical emergencies such as fractures, burns, hemorrhage, stroke, and wounds, ensuring timely and effective pre-hospital care.				
Course Outcomes					
CO1	Understand, measure and interpret the various types of vital signs and their normal ranges along with their clinical significance				
CO2	Perform CPR (Cardiopulmonary resuscitation) in adults and children.				
CO3	Assist in managing medical emergencies, including choking, fractures, burns, hemorrhage, stroke, and wounds.				

Module	Course Contents	Contact Hrs.	Mapped CO
1	Vital Signs and its Measurement: Introduction to vital signs, Types of vital signs, Normal ranges of vital signs, Methods and instruments used to monitor vital signs	10 Hours	CO1
2	CPR – Adult and Child: CPR (Cardiopulmonary resuscitation), Indications of CPR, Steps in CPR, The algorithm of Adult CPR, CPR (Cardiopulmonary resuscitation) in Child	10 Hours	CO2

3	Common Medical Emergencies and its Management Choking/Foreign body airway obstruction, Risk factors of choking, Mechanism of occurrence of choking, Signs of choking, Complications of choking, Choking management, First aid for fractures, Burns management, Haemorrhage management, Stroke management, Wound management	10 Hours	CO3
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Suggested Readings

1. Devendra Richhariya, Textbook of Emergency and Trauma Care, Jaypee Brothers Medical Publishers
2. S.P. Gupta & D.K. Gupta, Medical Emergencies in General Practice

Online Resources

1. <https://medlineplus.gov>
2. <https://cpr.heart.org>
3. <https://www.redcross.org>

Course Articulation Matrix														
PO-PSO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	2	—	3	2	—	—	—	—	1	—	—	2	2	1
CO2	1	—	1	1	—	—	—	2	2	2	3	2	1	—
CO3	1	1	2	2	—	1	1	2	3	2	2	2	1	—

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Program	B.Sc. (Hons) MLT				
Year	I	Semester		I	
Course Name	Healthcare Delivery System				
Code	BML 103T				
Course Type	MD	L	T	P	Credit
Pre-Requisite		2	1	0	3
Course Objectives	Understand the structure of the Indian healthcare delivery system, including its primary, secondary, and tertiary levels, as well as public and private sectors, while gaining knowledge about alternative healthcare systems under AYUSH and the role of hospitals in healthcare delivery. Understand National Health Programs, voluntary agencies, and foundational health concepts, including disease types and hospital roles in healthcare delivery. Comprehend the basic concepts of demography and epidemiology, including population statistics, trends, and principles of disease occurrence and distribution in the Indian context.				
Course Outcomes					
CO1	Describe the structure of the Indian healthcare system including levels of care (primary, secondary, tertiary), and differentiate the roles of public, private, and alternative systems like AYUSH.				
CO2	Explain the objectives of national health programs and voluntary health agencies, and define health and disease along with their determinants and influencing factors.				
CO3	Explain key demographic features of India and basic epidemiological concepts related to public health.				

Module	Course Contents	Contact Hrs.	Mapped CO
1	Indian Healthcare Delivery System and Alternative Medicine Introduction to Indian Health Care Delivery System, Levels of healthcare – Primary, secondary and tertiary levels, Healthcare Sectors - Public sector, Private sector, AYUSH (Ayurveda, Yoga, Unani, Siddha, and Homeopathy)	15 Hours	CO1

2	National Health Programs and Basic Concepts of Health and Disease: National Health programs, Voluntary health agencies, Basic concept of health, Basic concept of diseases, Health determinants, Types of diseases, Factors influencing health and disease, Hospital as an organization	15 Hours	CO2
3	Demography and Epidemiology: Demography of India: Population trends and statistics, Epidemiology: Basic principles, definitions	15 Hours	CO3

Suggested Readings

1. B.M. Sakharkar, Principles of Hospital Administration and Planning, Jaypee Brothers Medical Publishers
2. Caroline Curren, Meg Stacey, Concepts of Health, Illness and Disease: A Comparative

Online Resources

1. <https://lmis.nihfw.ac.in/local/course/view.php?id=734>
2. <https://ayush.gov.in/#/>
3. <https://www.india.gov.in/ministry-health-and-family-welfare-6>
4. <https://www.who.int/health-topics>

Course Articulation Matrix														
PO-PSO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	2	—	1	—	—	—	2	—	—	2	—	2	—	—
CO2	—	—	—	—	—	—	2	—	—	2	—	1	—	—
CO3	—	—	1	—	—	—	2	—	—	2	—	1	—	—

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Program	B.Sc. (Hons) MLT				
Year	I	Semester	I		
Course Name	Digital Literacy				
Code	BML 104T				
Course Type	AEC	L	T	P	Credit
Pre-Requisite		2	0	0	2
Course Objective	Describe the fundamental components of a computer, basic operations, and perform number system conversions. Explain the principles of computer networks, operating systems, and basic internet concepts. Demonstrate effective use of MS Office tools for word processing, creating spreadsheets, and preparing presentations.				
Course Outcomes					
CO1	Describe basic computer components, operations, and number system conversions.				
CO2	Explain computer networks, operating systems, and internet fundamentals.				
CO3	Utilize MS Office tools effectively for word processing, spreadsheets, and presentations.				

Module	Course Contents	Contact Hrs.	Mapped CO
1	Introduction to Computer, Operations and Number System Characteristics of computer, Application of computer, Classification of computer, Types of computers, Generation and organization, Computer languages, Input and output devices, Hardware and software, Computer memory, Number system, Different types of number systems used in computer, Number system conversion	5 Hours	CO1
2	Computer Network, Operating System and Internet: Introduction to computer networks, Networking components, Classification and types of networks, Topologies, Communication channels, Client server architecture, LAN concepts Introduction to operating system, Functions of operating system, Types of operating system, Classification of	8 Hours	CO2








	operating system, Components of operating system, Basics of internet		
3	MS Office: MS Word, MS Excel, MS PowerPoint	17 Hours	CO3

Suggested Readings

1. The Essentials of Computer Organization and Architecture, Linda Null and Julia Lobur, 2006
2. Understanding Digital Literacies: A Practical Introduction, Rodney H. Jones and Christoph A. Hafner, 2016

Online Resources

1. <https://lms.nihfw.ac.in/local/course/view.php?id=734>
2. https://www.researchgate.net/publication/313309097_Operating_Systems#:~:text=An%20operating%20system%20is%20a,physical%20computer%20to%20execute%20applications.
3. <https://lincs.ed.gov/sites/default/files/TSTMDigitalLiteracyBrief-508.pdf>
4. <https://davpgcvns.ac.in/wp-content/uploads/2020/11/Introduction-of-MS-Office-MS-Word-PDF-eng.pdf>

Course Articulation Matrix														
PO-PSO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	—	—	—	—	2	—	2	—	—	2	2	—	—	—
CO2	—	—	—	—	2	—	2	—	—	2	2	—	—	—
CO3	—	—	—	—	2	—	3	—	—	2	2	2	—	—

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Program	B.Sc. (Hons) MLT				
Year	I	Semester		I	
Course Name	Communicative English				
Code	BML 105T				
Course Type	SEC	L	T	P	Credit
Pre-Requisite		2	1	0	3
Course Objective	Understand and differentiate between various types of communication skills, including verbal and non-verbal forms. Demonstrate effective communication using appropriate body language, posture, and context-based interactions. Apply personal hygiene and grooming etiquette to maintain a professional and presentable appearance.				
Course Outcomes					
CO1	Understand and differentiate between various types of communication skills, including verbal and non-verbal forms.				
CO2	Demonstrate effective communication using appropriate body language, posture, and context-based interactions.				
CO3	Apply personal hygiene and grooming etiquette to maintain a professional appearance.				

Module	Course Contents	Contact Hrs.	Mapped CO
1	Communication Skills and Types of Communication Communication skills, Types of communication skills, Oral communication, Written communication, Facial expressions, Tone of voice, Pitch of voice, Body language	15 Hours	CO1
2	Body Language and Posture: Components of body language, Components of posture	15 Hours	CO2
3	Personal Hygiene and Grooming Importance of personal hygiene, Components of personal hygiene, Grooming etiquette, Do's and Don'ts of Grooming	15 Hours	CO3

Suggested Readings

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1. Ahuja, B.N. and S.S. Chopra, Communication, Surjeet Publications, 2006
2. Barun K Mitra, Personality Development and Soft Skills, Oxford University Press, 2016

Online Resources

1. <https://www.skillsyouneed.com>
2. <https://www.mindtools.com>
3. <https://alison.com>

Course Articulation Matrix														
PO-PSO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	—	—	—	—	—	—	—	2	2	—	—	3	—	—
CO2	—	—	—	—	—	—	—	2	2	—	—	3	—	—
CO3	—	—	—	2	—	—	—	3	—	—	—	2	—	—

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Program	B.Sc. (Hons) MLT				
Year	I	Semester	I		
Course Name	Environment and Ecological Sustainability				
Code	BML 106T				
Course Type	VAC	L	T	P	Credit
Pre-Requisite		2	1	0	3
Course Objectives	To develop basic knowledge of environment, ecology and ecosystem. To impart basic and key knowledge of atmospheric and global climate change. To develop a knowledge of natural resources, conservation and sustainable use. To recognize knowledge of effects disturbance, adaptation and development in the ecosystem. To help students to acquire knowledge of pollution and environment protection.				
Course Outcomes					
CO1	Understand atmosphere and climatic change, major biome and ecosystem energy.				
CO2	Be able to conserve natural resources and to learn equity at different levels and benefits of sustainable use of natural resources.				
CO3	Develop improved understanding of environmental pollution, principles and application of environmental management tools including legislation and regulation.				

Module	Course Contents	Contact Hrs.	Mapped CO
1	Environment & Ecology Environment and its segments: Definition, Scope and importance; Atmosphere: Composition, characterization, temperature behaviour and atmospheric stability, climate change; Hydrosphere; Water distribution Lithosphere: Structure and composition. Biosphere Ecology and Ecosystem: Introduction, Concept of an Ecosystem.	15 Hours	CO1

	Structure and function of Ecosystem, Energy flow in an Ecosystem, Food chain and food web, Types of Ecosystem; Ecological Pyramids: Definition, Types of Ecological Pyramid Material cycle; Definition and importance, Nitrogen and carbon cycle.		
2	Natural Resources: Natural resources: Definition, types of natural resource Water Resources: Drinking water quality, Water crisis and uses, Water borne and water induced diseases, Fluoride problem in drinking water, Rain water harvesting; Forest Resources: Impact of deforestation on environment Food resources: Crisis, Food adulteration and Hygiene National Policy for Food Security and Managements. Mineral Resources: Use and exploitation of minerals, Impact of mining on environment; Energy resources: Conventional and nonconventional energy sources, Solar energy, Hydropower energy, Hydrogen energy, Biomass-energy Sustainable Development: Definition, sustainable use and conservation of natural resource, Equitable use of Resources, Common Property Resources; Biodiversity and its conservation Environment Management System(EMS): Definition, stages of EMS, cost and benefits of EMS	15 Hours	CO2
3	Environmental Pollution and Protection Environmental Pollution: Definition, Pollutants, sources, causes, effects and control measures of air, water, and soil pollution; Noise: Sources of Noise pollution, Measurement of noise, Noise exposure levels and standards. Impact of noise on human health. Noise control and abatement measures. Current environmental Issues: Population growth, Logistic growth curve equation. Climate change, Global Warming, Acid rain, Ozone layer, Waste Water Treatments. Solid Waste Management, Natural disaster and its management. Environment Protection: Legal aspects of Environment Protection, Environment Protection Act, Air(Prevention and Control of Pollution)Act, Water(Prevention and control of Pollution) Act, Role of NGOs in Environment Protection. Environmental Protection and Sustainability Environmental Education and Awareness.	15 Hours	CO3

Suggested Readings

1. Daniel B. Botkin and Edward A. Keller, Environmental Science: Earth as a Living Planet
2. R. Rajagopalan, Environmental Studies
3. William P. Cunningham and Mary Ann Cunningham, Principles of Environmental Science:

Inquiry and Applications

Online Resources

1. <https://pubmed.ncbi.nlm.nih.gov/31506839/>
2. <https://ecology.edu>

Course Articulation Matrix														
PO-PSO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	—	—	—	2	—	2	2	2	—	2	2	1	—	—
CO2	—	—	—	2	—	2	2	—	—	2	2	—	—	—
CO3	—	—	—	3	—	3	3	—	—	2	2	2	—	—



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Program	B.Sc. (Hons) MLT				
Year	I	Semester		I	
Course Name	Fundamentals of Medical Lab Technology Lab				
Code	BML 101P				
Course Type	DSC	L	T	P	Credit
Pre-Requisite		0	0	6	3
Course Objective	Identify and label major anatomical structures of the respiratory, digestive, circulatory, excretory, and nervous systems accurately. Recognize and describe the layers of the skin, explaining their structure and functional significance. Identify different types of bones and joints in the human body and understand their anatomical locations and roles.				
Course Outcomes					
CO1	Identify and label major anatomical structures of the respiratory, digestive, circulatory, excretory, and nervous systems.				
CO2	Recognize and describe the layers of the skin and their functional significance.				
CO3	Identify different types of bones and joints in the human body and understand their anatomical positioning.				

S. No.	List of Experiments	
1	Identification of different parts of the respiratory system	CO1
2	Identification of different parts of the digestive system	CO1
3	Identification of different layers of the skin	CO2
4	Identification of different parts of the circulatory system	CO1
5	Identification of different parts of the excretory system	CO2
6	Identification of different parts of the nervous system	CO2
7	Identification of different bones and joints in the human body	CO3

Suggested Readings

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1. Davi-Allen Chabner, Medical Terminology: A Short Course, Saunders, 2017
2. Barbara Janson Cohen, Shirley A Jones, Medical Terminology an Illustrated Guide, Ninth edition
3. G Deepa, PR Ashalatha, Textbook of Applied Anatomy and Physiology for Nurses, Jaypee Brothers Medical Publishers
4. B.D. Chaurasia, Applied Anatomy and Physiology for BSc Nursing Students, CBS Publishers & Distributors Pvt. Ltd.

Online Resources

1. <https://www.ncbi.nlm.nih.gov/books/NBK607454/>
2. <https://www.ascp.org>
3. <https://clsi.org>
4. <https://www.cdc.gov/labtraining/index.html>

Course Articulation Matrix														
PO-PSO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	3	—	2	—	—	—	—	—	—	1	—	—	3	2
CO2	2	—	1	—	—	—	—	—	—	—	—	—	2	1
CO3	3	—	1	—	2	—	—	—	—	1	—	—	3	1

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Program	B.Sc. (Hons) MLT				
Year	I	Semester		I	
Course Name	Vital Signs and Management of Medical Emergencies Lab				
Code	BML 102P				
Course Type	DSC	L	T	P	Credit
Pre-Requisite		0	0	4	2
Course Objective	Measure and accurately record vital signs including temperature, respiratory rate, pulse, blood pressure, and oxygen saturation. Demonstrate the correct procedures for performing CPR and defibrillation on adults and children. Apply appropriate first aid techniques to manage emergency situations such as choking effectively.				
Course Outcomes					
CO1	Measure and record vital signs including temperature, respiratory rate, pulse, blood pressure, and oxygen saturation.				
CO2	Demonstrate the correct procedure for CPR and defibrillation in adults and children.				
CO3	Manage emergency scenarios such as choking using appropriate first aid techniques.				

S. No.	List of Experiments	
1	Determination of temperature and respiratory rate	CO1
2	Determination of pulse, blood pressure and oxygen saturation	CO1
3	Perform CPR in adults and children	CO2
4	Perform defibrillation	CO2
5	Perform choking management	CO3

Suggested Readings

1. Devendra Richhariya, Textbook of Emergency and Trauma Care, Jaypee Brothers Medical Publishers
2. S.P. Gupta & D.K. Gupta, Medical Emergencies in General Practice

Online Resources

1. <https://medlineplus.gov>
2. <https://cpr.heart.org>
3. <https://www.redcross.org>

Course Articulation Matrix														
PO-PSO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	3	—	3	2	2	2	2	1	1	1	2	2	3	2
CO2	2	—	2	2	1	1	1	2	2	2	3	2	2	1
CO3	2	1	2	2	—	1	1	2	3	2	2	2	2	2

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Program	B Sc. (Hons) MLT				
Year	I	Semester		II	
Course Name	Basic Medical Lab Techniques and Blood Banking				
Code	BML 201T				
Course Type	DSC	L	T	P	Credit
Pre-Requisite		3	1	0	4
Course Objectives	Perform hematology and blood bank procedures with safety and accuracy. Understand basics of biochemistry including nutrients, hormones, and organ tests Explain immunity and conduct urine, sputum, and stool examinations. Apply fundamental microbiology concepts and perform basic culture and staining techniques.				
Course Outcomes					
CO1	Demonstrate proficiency in hematological practices and blood bank operations, including blood collection, analysis, testing, storage, transportation, and safe handling of laboratory tools and biohazard risks.				
CO2	Have an elementary knowledge of carbohydrates, fats (lipids), and proteins, hormones, minerals and electrolytes, acid-base balance and organ function tests.				
CO3	Understand the role of immunity in disease defense and conduct urine, sputum, and stool examinations.				
CO4	Understand microbiology fundamentals, including bacterial classification, growth, diagnostic techniques, and antibiotic sensitivity, along with the basics of virology, mycology, and parasitology, and perform basic microbiology culture and staining techniques.				

Module	Course Contents	Contact Hrs.	Mapped CO
I	Basics of Hematology and Diagnostic Techniques: Basics of haematology, Role of an MLT in haematology, Blood and its Composition, Complete Blood Count (CBC), DLC, Blood collection system, Haemocytometer and Apparatus used in Haematology, Pipette & Pipetting techniques, Glassware used in laboratory, Sample collection and preservation, Types of	15 Hours	CO1

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	sample, Sample collection errors, Sample labeling, documentation and handling, Sample storage and transportation, Needle stick injury and sharp injuries, Blood and body fluids spill management, Blood grouping and Rh typing: Cross-matching techniques, Blood component preparation and storage, Blood transfusion protocols and donor screening	1	
2	Basics of Biochemistry: Basic nutrients, Carbohydrates, Lipids, Proteins, Clinical enzymology, Hormones, Minerals, Electrolytes, Acid-base balance, Organ function tests	15 Hours	CO2
3	Basics of Immunology and Clinical Pathology: Immunology and types of immunity, Acquired immunity, T-cell and B-cell immunity, Mechanisms of immunity and autoimmunity, Antigen-antibodies and their interactions, Hypersensitivity reactions and types of hypersensitivity, Serological tests: Principles, types, and applications, Urine, stool and sputum examination	15 Hours	CO3
4	Basics of Microbiology: Introduction of microbiology, Anatomy of a bacterial cell, Bacterial survival mechanism, Classification of bacteria, Bacterial growth, Culture media, Bacterial cultivation, Common staining methods, Microscopy, Biochemical tests in microbiology, Antibiotic resistance, Antibiotic sensitivity tests, Clinically important bacteria, Basics of Virology, Mycology and Parasitology	15 Hours	CO4

Suggested Readings

1. Provan, Baglin, Dokal, De Vos, Oxford handbook of clinical haematology,
2. Ramnik Sood, Medical Laboratory Technology (2 Vols. Set), Jaypee Brothers Medical Publishers (P) Ltd
3. Roger L. Lundblad, Fiona Macdonald, Handbook of Biochemistry and Molecular Biology
4. Abul K. Abbas, MBBS, Shiv Pillai, MBBS, PhD, Andrew H. Lichtman, MD, PhD, Basic Immunology E-Book, Functions and Disorders of the Immune System
5. Shirish M Kawthalkar, Essentials of Clinical Pathology, Jaypee brothers
6. Darshan P. Godkar, Praful B. Godkar, Textbook of Medical Laboratory Technology (Set of 2 Volumes) - Clinical Laboratory Science and Molecular Diagnosis
7. Amrita Rohilla, Handbook of Microbiology

Online Resources

1. <https://www.cdc.gov/labtraining/>
2. <https://pubmed.ncbi.nlm.nih.gov>
3. <https://bio.libretexts.org>
4. <https://www.immunology.org>
5. <https://www.hematology.org>

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6. <https://main.icmr.ijic.in>
7. <https://medlineplus.gov>

Course Articulation Matrix														
PO-PSO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	3	2	2	3	3	3	2	3	2	2	3	2	3	2
CO2	2	—	2	—	—	2	1	2	—	2	1	1	2	2
CO3	2	2	3	2	—	2	2	2	2	2	2	2	2	3
CO4	3	—	2	2	2	2	1	2	2	2	2	2	3	2

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Program	B.Sc. (Hons) MLT				
Year	I	Semester		II	
Course Name	Infection Control and Biomedical Waste Management				
Code	BML 202T				
Course Type	DSC	L	T	P	Credit
Pre-Requisite		2	0	0	2
Course Objective	Apply infection control and proper PPE use. Implement sterilization and biomedical waste protocols. Understand vaccination importance for healthcare workers.				
Course Outcomes					
CO1	Understand different types of infections and apply infection control measures, including proper hand hygiene practices, utilizing PPE.				
CO2	Demonstrate knowledge of sterilization methods and BMW by implementing correct protocols				
CO3	Understand the importance of vaccination for healthcare workers.				

Module	Course Contents	Contact Hrs.	Mapped CO
1	Infection & its Types and Infection Control and Prevention Definition of infection and infectious diseases, Types of infection – Acute, Chronic, Primary, Localized, Systemic, Clinical, Subclinical and Hospital Acquired Infections, Measures of Infection Control, Importance of Hand Hygiene, Hand washing Techniques, Hand Rub Techniques, 5 moments of hand Hygiene, PPE, Importance of PPE, Types of PPE and its uses, Sequence for donning and removing – PPE, Sterilization: introduction	10 Hours	CO1
2	Sterilization and BMW Management Sterilization vs Disinfection, Different methods of sterilization, Know about hot air oven, Autoclave, Factors affecting autoclave, Process of Autoclaving, Advantages and disadvantages of autoclave, Categorization of biomedical wastes, Steps for BMW management – Segregation and colour codes for BMW, collection, storage and transportation of waste, Different methods for treatment of biomedical waste	10 Hours	CO2

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3	Vaccination for Healthcare Professionals: Importance of vaccines for healthcare workers, Risk categorization, Currently recommended vaccines for healthcare workers, Post exposure prophylaxis	10 Hours	CO3
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Suggested Readings

1. S. Apruba Sastry, R. Deepashree, Essentials of Hospital Infection Control, Jaypee Brothers Medical Publishers
2. Singh Anantpreet, Kaur Sukhjit, Biomedical Waste Disposal, Jaypee Brothers Medical Publishers

Online Resources

1. <https://www.cdc.gov>
2. <https://main.icmr.nic.in>
3. <https://www.ncbi.nlm.nih.gov/books>
4. <https://www.who.int/infection-prevention>

Course Articulation Matrix														
PO-PSO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	2	—	2	3	2	2	2	2	1	2	2	2	2	2
CO2	2	—	2	3	2	3	2	2	—	2	2	2	2	2
CO3	1	—	1	2	—	1	1	2	—	1	—	1	1	—

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Program	B.Sc. (Hons) MLT				
Year	I	Semester		II	
Course Name	Hospital Services				
Code	BML 203T				
Course Type	MD	L	T	P	Credit
Pre-Requisite		2	1	0	3
Course Objective	Describe hospital services, including patient care and specialized units. Explain the roles of key support services in hospital operations. Understand the functions of auxiliary services supporting hospital management.				
Course Outcomes					
CO1	Define and explain hospital services, including OPD/IPD patient care and the functions, planning, and requirements of specialized units like ICU, operation theaters, and daycare.				
CO2	Understand the functions of support services such as CSSD, dietary, laundry, blood bank, medical gas systems, and pharmacy services.				
CO3	Explain the functions and roles of auxiliary services, including registration, admitting departments, recordkeeping, ambulance & transport, and housekeeping in supporting hospital operations.				

Module	Course Contents	Contact Hrs.	Mapped CO
1	Core Hospital Services: Introduction to hospital services, Classification of hospital services, Emergency services, OPD services, Inpatient services, ICU, Operation theater, Daycare services	15 Hours	CO1
2	Support Services: Introduction to support services, CSSD, Dietary, Laundry, Blood bank services, Medical gas system, Pharmacy services, Quality mandates for a hospital pharmacy	15 Hours	CO2
3	Auxiliary Services: Registration, Admitting department, Recordkeeping, Ambulance & transport, Maintenance department, Housekeeping Department	15 Hours	CO3

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Suggested Readings

1. B.M. Sakharkar, Principles of Hospital Administration and Planning, Jaypee Brothers Medical Publishers
2. Caroline Curren, Meg Stacey, Concepts of Health, Illness and Disease: A Comparative
3. Tabish Syed Amin, Hospital and Health Services Administration: Principles and Practices, OUP India

Online Resources

1. <https://nhsrindia.org>
2. <https://main.mohfw.gov.in>
3. <https://www.nabh.co>

Course Articulation Matrix														
PO-PSO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	1	—	—	—	—	1	2	2	2	2	—	2	—	—
CO2	—	—	—	—	—	1	2	—	—	2	—	1	—	—
CO3	—	—	—	—	—	1	2	—	—	2	—	1	—	—



Program	B.Sc. (Hons) MLT				
Year	I	Semester		II	
Course Name	Business Communication				
Code	BML 204T				
Course Type	AEC	L	T	P	Credit
Pre-Requisite		2	1	0	3
Course Objective	Understand and apply various communication methods in healthcare settings. Demonstrate effective communication with colleagues, clients, and customers. Handle sensitive healthcare communications confidently and professionally.				
Course Outcomes					
CO1	Understand the purpose and mechanisms of communication, including verbal, non-verbal, written, intrapersonal and group communication; and apply them effectively in healthcare settings.				
CO2	Apply effective communication techniques in workplace interactions with colleagues, clients, and customers				
CO3	Communicate effectively in healthcare settings, addressing sensitive issues with confidence and professionalism.				

Module	Course Contents	Contact Hrs.	Mapped CO
1	Communication, its Types and Methods Communication, Communication in society, How do we communicate, Non-verbal communication, Verbal communication, Forms of written communication, Intrapersonal communication, Group communication	15 Hours	CO1
2	Effective Communication at Workplace: Introduction to effective communication, Importance of effective communication, Verbal communication at workplace, Written communication at workplace	15 Hours	CO2
3	Communication in Healthcare: Types of communication in healthcare – Inter hospital and intra hospital communication, Causes and effects of poor communication in healthcare, Coping with anxiety while	15 Hours	CO2

	communicating bad news, Effective communication checklist in healthcare, Learn how to communicate with patients and caregivers, Tips to communicate effectively		
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Suggested Readings

1. Aluja, B.N. and S.S. Chopra, Communication, Surjeet Publications, 2006
2. Barun K Mitra, Personality Development and Soft Skills, Oxford University Press, 2016

Online Resources

1. <https://www.skillsyouneed.com>
2. <https://www.mindtools.com>
3. <https://alison.com>

Course Articulation Matrix														
PO-PSO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	-	-	-	-	-	-	2	2	2	2	-	3	-	-
CO2	-	-	-	-	-	-	2	2	3	2	-	3	-	-
CO3	-	-	-	-	-	-	2	3	3	2	-	3	-	-

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Program	B.Sc. (Hons) MLT				
Year	I	Semester		II	
Course Name	Job Ready Skills I				
Code	BML 205T				
Course Type	SEC	L	T	P	Credit
Pre-Requisite		2	0	0	2
Course Objective	Apply time management techniques to prioritize and organize tasks efficiently. Collaborate effectively in teams by building positive relationships and enhancing quality. Use critical thinking to solve problems creatively and make informed decisions.				
Course Outcomes					
CO1	Apply time management techniques to organize and prioritize tasks efficiently.				
CO2	Work effectively in teams by understanding the dynamics, building constructive relationships, and recognizing key factors contributing to quality improvement.				
CO3	Use critical thinking to solve problems systematically and creatively, and make informed decisions in work and personal settings.				

Module	Course Contents	Contact Hrs.	Mapped CO
1	Time Management: Introduction to time management, Importance of time management, Time management matrix, How to manage time	10 Hours	CO1
2	Teamwork and Quality Consciousness Introduction to teamwork, Importance of teamwork, Basic elements of teamwork, Building positive relationships, Quality, Strategies to improve quality	10 Hours	CO2
3	Problem-solving and Decision Making Skills Critical thinking, Developing critical thinking mindset, Decisions, Effective decision-making process	10 Hours	CO3

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Suggested Readings

1. S P Dhanavel, English and Soft Skills, Orient BlackSwan
2. Gupta Seema, Soft Skills - Interpersonal and Intrapersonal Skills Development, V&S Publishers

Online Resources

1. <https://www.mindtools.com>
2. <https://www.skillsyouneed.com>

Course Articulation Matrix														
PO-PSO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	—	—	—	—	2	2	2	2	2	2	2	2	—	—
CO2	—	—	—	—	—	2	2	2	3	2	—	2	—	—
CO3	—	—	2	—	2	2	2	2	2	2	3	2	—	—

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Program	B.Sc. (Hons) MLT				
Year	I	Semester		II	
Course Name	AI Tools				
Code	BML 206T				
Course Type	VAC	L	T	P	Credit
Pre-Requisite		2	1	0	3
Course Objective	Understand fundamental concepts of artificial intelligence and the types of AI tools available. Explore common AI tools and platforms, learning their key features and real-world applications. Apply AI tools responsibly while recognizing ethical considerations in their usage.				
Course Outcomes					
CO1	Explain the basics of AI and identify different categories of AI tools.				
CO2	Demonstrate familiarity with popular AI platforms and describe their functionalities.				
CO3	Evaluate ethical challenges in AI and practice responsible use of AI technologies.				

Module	Course Contents	Contact Hrs.	Mapped CO
1	Introduction to Artificial Intelligence and AI Tools Overview of Artificial Intelligence (AI) concepts, Types of AI tools and their applications, Basics of machine learning and data processing	15 Hours	CO1
2	Common AI Tools and Platforms Introduction to popular AI tools (e.g., chatbots, image recognition, speech recognition), Features and functionalities of AI platforms, Use cases across industries	15 Hours	CO2
3	Practical Applications and Ethical Considerations How to use AI tools effectively in everyday tasks, Benefits and challenges of AI adoption, Ethical issues and responsible AI use	15 Hours	CO3

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Suggested Readings

1. Russell, Stuart, and Peter Norvig. 2021. Artificial Intelligence: A Modern Approach. 4th ed. Upper Saddle River, NJ: Pearson.
2. Nilsson, Nils J. 2014. Principles of Artificial Intelligence. San Francisco, CA: Morgan Kaufmann.
3. Marr, Bernard. 2020. Artificial Intelligence in Practice: How 50 Successful Companies Used AI and Machine Learning to Solve Problems. New York: Wiley.
4. Floridi, Luciano. 2019. The Ethics of Artificial Intelligence. Oxford: Oxford University Press.

Online Resources

1. <https://ai.google.dev/>
2. <https://github.com/microsoft/AI-For-Beginners>

Course Articulation Matrix														
PO-PSO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	2	—	2	—	3	2	2	—	—	2	2	2	2	2
CO2	2	—	2	—	3	2	2	—	—	2	2	2	2	2
CO3	1	—	2	—	2	2	2	2	—	2	2	3	2	2

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Program	B.Sc. (Hons) MLT				
Year	I	Semester		II	
Course Name	Basic Medical Lab Techniques and Blood Banking Lab				
Code	BML 201P				
Course Type	DSC	L	T	P	Credit
Pre-Requisite		0	0	6	3
Course Objective	Demonstrate proficiency in basic hematological and clinical lab techniques, including venipuncture, blood grouping, and hemoglobin estimation. Identify and correctly use key laboratory equipment and tools, adhering to proper techniques and safety measures. Perform essential microbiological procedures such as culture media identification, culturing, Gram staining, and acid-fast staining for diagnostics.				
Course Outcomes					
CO1	Demonstrate proficiency in basic hematological and clinical laboratory techniques, including venipuncture, order of draw, blood grouping, total RBC/WBC count, and hemoglobin estimation using Sahli's method.				
CO2	Identify and appropriately use essential laboratory equipment and tools, such as compound microscopes, pipettes, volumetric glassware, and blood bank instruments, ensuring correct technique and safety protocols.				
CO3	Perform fundamental microbiological techniques, including identification of culture media, culturing methods, Gram staining, and acid-fast staining, to support diagnostic processes.				

S. No.	List of Experiments	
1	Perform venipuncture	CO1
2	Perform order of draw	CO1
3	Perform blood grouping	CO1
4	Identification of equipment used in blood bank	CO1
5	Determination of total WBC and RBC count	CO1
6	Hemoglobin estimation by Sahli's method	CO1
7	Identification and use of different parts of the compound microscope	CO2

8	Identification and use of different types of pipettes and pipetting techniques	CO2
9	Identification and use of different types of volumetric and non-volumetric glassware used in the laboratory	CO2
10	Identification of equipment used in blood bank	CO2
11	Identification of different types of culture media	CO3
12	Perform culturing methods	CO3
13	Perform gram staining method	CO3
14	Perform acid-fast staining method	CO3

Suggested Readings

1. Provan, Baglin, Dokal, De Vos, Oxford handbook of clinical haematology,
2. Ramnik Sood, Medical Laboratory Technology (2 Vols. Set), Jaypee Brothers Medical Publishers (P) Ltd
3. Roger L. Lundblad, Fiona Macdonald, Handbook of Biochemistry and Molecular Biology
4. Abul K. Abbas, MBBS, Shiv Pillai, MBBS, PhD, Andrew H. Lichtman, MD, PhD, Basic Immunology E-Book, Functions and Disorders of the Immune System
5. Shirish M Kawthalkar, Essentials of Clinical Pathology, Jaypee brothers
6. Darshan P. Godkar, Praful B. Godkar, Textbook of Medical Laboratory Technology (Set of 2 Volumes) - Clinical Laboratory Science and Molecular Diagnosis
7. Amrita Rohilla, Handbook of Microbiology

Online Resources

1. <https://www.cdc.gov/labtraining/>
2. <https://pubmed.ncbi.nlm.nih.gov>
3. <https://bio.libretexts.org>
4. <https://www.immunology.org>
5. <https://www.hematology.org>
6. <https://main.icmr.nic.in>
7. <https://medlineplus.gov>

Course Articulation Matrix														
PO-PSO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	3	2	2	3	3	3	2	2	2	2	3	2	3	2
CO2	2	—	2	2	2	3	2	2	2	2	2	2	2	2

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CO3	3	-	2	3	3	3	2	2	2	2	3	2	3	2
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Program	B.Sc. (Hons) MLT				
Year	I	Semester		II	
Course Name	Infection Control and Biomedical Waste Management Lab				
Code	BML 202P				
Course Type	DSC	L	T	P	Credit
Pre-Requisite		0	0	4	2
Course Objective	Demonstrate effective hand hygiene through proper handwashing and hand rub techniques to prevent infections. Perform correct donning and doffing of PPE to ensure safety and infection control. Apply biomedical waste segregation using appropriate color-coded bins in compliance with regulations.				
Course Outcomes					
CO1	Demonstrate proper hand hygiene techniques through effective handwashing and handrub methods to prevent healthcare-associated infections.				
CO2	Perform correct donning and doffing procedures for Personal Protective Equipment (PPE) ensuring infection control and personal safety in clinical settings.				
CO3	Apply biomedical waste segregation protocols by identifying waste categories and using appropriate color-coded bins in compliance with safety and regulatory standards.				

S. No.	List of Experiments	
1	Perform method of handwashing	CO1
2	Perform method of handrub	CO1
3	Perform donning and doffing of PPE	CO2
4	Segregation of biomedical waste	CO3

Suggested Readings

1. S. Apruba Sastry, R. Deepashree, Essentials of Hospital Infection Control, Jaypee Brothers Medical Publishers, 2019

2. Singh Anantpreet, Kaur Sukhjit, Biomedical Waste Disposal, Jaypee Brothers Medical Publishers, 2012

Online Resources

1. <https://www.cdc.gov>
2. <https://main.icmr.nic.in>
3. <https://www.ncbi.nlm.nih.gov/books>
4. <https://www.who.int/infection-prevention>

Course Articulation Matrix														
PO-PSO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	2	—	2	3	2	2	2	2	1	2	2	2	2	2
CO2	2	—	2	3	2	3	2	2	—	2	2	2	2	2
CO3	2	—	2	3	2	3	2	2	—	2	2	2	2	2

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Program	B.Sc. (Hons) MLT				
Year	II	Semester		III	
Course Name	Advanced Medical Lab Techniques and Blood Banking				
Code	BML 301T				
Course Type	DSC	L	T	P	Credit
Pre-Requisite	Basic Medical Lab Techniques and Blood Banking	3	1	0	4
Course Objective	Apply clinical and technical skills to reduce lab errors, diagnose hematological disorders, and manage blood bank processes. Perform and interpret key biochemical tests for organ function and metabolic assessment. Understand immune mechanisms, advanced immunodiagnostics, and conduct fluid and semen analysis. Utilize advanced microbiological and molecular techniques to identify pathogens and support diagnosis.				
Course Outcomes					
CO1	Apply clinical and technical knowledge to minimize laboratory errors, diagnose hematological disorders, understand histopathology and cytopathology basics, and assist effectively in blood donation, component preparation, infection screening, and transfusion documentation.				
CO2	Conduct and interpret advanced biochemical assessments, including kidney and liver function tests, lipid profiles, electrolyte panels, and urinalysis for diagnostic purposes.				
CO3	Understand immune responses, antigen-antibody interactions, autoimmune disorders, and advanced diagnostic techniques like ELISA and immunofluorescence, along with fluid and semen examinations.				
CO4	Apply advanced bacterial cultivation, culture methods, and molecular diagnostics like PCR, and study virology, mycology, and parasitology to identify clinically significant pathogens.				

Module	Course Contents	Contact Hrs.	Mapped CO
1	Advanced Hematology and Diagnostic Techniques: Common errors in medical laboratory, Preanalytical errors, Analytical errors, Post analytical errors, Hemolysis, Order of	15 Hours	CO1

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	draw, Clinical hematology, Anemia, Coagulation defects, Routine hemorrhagic tests, Basics of histopathology and cytopathology, Blood donation complications, Screening of transfusion transmissible infection, Preparation of blood components, Transfusion reactions, Documentation in transfusion service		
2	Advanced Biochemistry: Blood glucose estimation, GOD/POD methods, Kidney function test - Serum and Urea - DAM method, Urea clearance test, Creatinine and Creatinine clearance test, Uric acid estimation, Liver function test, Lipid profile & Serum total cholesterol, Serum HDL Cholesterol, Serum triglyceride, Electrolyte panel, Serum Sodium Test, Serum potassium, Serum chloride, Serum Calcium, Serum phosphorus, Urinalysis, Stool chemistry	15 Hours	CO2
3	Advanced Immunology and Pathology: Acquired Immunity: Types of immune response, Cell mediated immune response, Humoral immune response, Antigen and antibody reactions, Immunofluorescence and ELISA, Autoimmune disorders, Human immunodeficiency disease, Semen examination, CSF examination, Body cavity fluid analysis	15 Hours	CO3
4	Advanced Microbiology: Bacterial cultivation (Advanced), Culture methods (Advanced), Specific culture methods, Common culture media, Biochemical tests (Advanced), Negative staining, Advanced bacteriology, Advanced Virology, Mycology and Parasitology, Polymerase chain reaction (PCR)	15 Hours	CO4

Suggested Readings

1. Provan, Baglin, Doka, De Vos, Oxford handbook of clinical haematology,
2. Ramnik Sood, Medical Laboratory Technology (2 Vols. Set), Jaypee Brothers Medical Publishers (P) Ltd
3. Roger L. Lundblad, Fiona Macdonald, Handbook of Biochemistry and Molecular Biology
4. Abul K. Abbas, MBBS, Shiv Pillai, MBBS, PhD, Andrew H. Lichtman, MD, PhD, Basic Immunology E-Book, Functions and Disorders of the Immune System
5. Shirish M Kawthalkar, Essentials of Clinical Pathology, Jaypee brothers
6. Darshan P. Godkar, Praful B. Godkar, Textbook of Medical Laboratory Technology (Set of 2 Volumes) - Clinical Laboratory Science and Molecular Diagnosis
7. Amrita Rohilla, Handbook of Microbiology

Online Resources

1. <https://www.cdc.gov/labtraining/>
2. <https://pubmed.ncbi.nlm.nih.gov>
3. <https://bio.libretexts.org>

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4. <https://www.immunology.org>
5. <https://www.hematology.org>
6. <https://main.icmr.nic.in>
7. <https://medlineplus.gov>

Course Articulation Matrix														
PO-PSO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	3	2	2	2	2	3	2	3	2	2	3	2	3	3
CO2	3	2	3	1	3	3	2	2	2	2	2	2	3	3
CO3	3	2	3	2	2	3	2	3	2	3	2	2	3	3
CO4	3	2	3	3	3	3	2	2	2	3	3	2	3	3

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Program	B.Sc. (Hons) MLT				
Year	II	Semester		III	
Course Name	Laboratory Management and Information System				
Code	BML 302T				
Course Type	DSC	L	T	P	Credit
Pre-Requisite		2	1	0	3
Course Objective	Apply laboratory management principles to ensure effective planning, safety, and accurate documentation. Implement quality control and assurance practices while managing laboratory equipment efficiently. Utilize laboratory information systems, both manual and computerized, to support accreditation and data management.				
Course Outcomes					
CO1	Explain the importance of laboratory management, apply principles for effective planning and maintenance, follow safety guidelines, and maintain accurate laboratory documentation and records.				
CO2	Follow quality control and assurance methods and manage laboratory equipment effectively.				
CO3	Understand the role and importance of laboratory information systems in accreditation and effectively use both manual and computerized systems for laboratory information management.				

Module	Course Contents	Contact Hrs.	Mapped CO
1	Laboratory Management and Safety: Importance of laboratory management, Laboratory management, Laboratory planning and maintenance, Laboratory safety guidelines, Laboratory documentation and records	15 Hours	CO1
2	Quality Management: Quality control, Quality assurance, Equipment management	15 Hours	CO2
3	Laboratory Information System: Importance of laboratory information system, Laboratory accreditation, Manual paper based system, Computerized laboratory system	15 Hours	CO3

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Suggested Readings

1. Laboratory quality management system: handbook, World Health Organization
2. Gerardus Blokdyk, Laboratory Information Management System LIMS Third Edition

Online Resources:

1. <https://www.labmanager.com/science-lab-safety-rules-guidelines-5727>
2. <https://www.osha.gov/sites/default/files/publications/OSHA3404laboratory-safety-guidance.pdf>

Course Articulation Matrix														
PO-PSO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	2	—	2	3	2	2	3	3	2	2	2	3	2	2
CO2	3	—	2	2	3	3	2	2	—	2	3	—	2	2
CO3	2	—	2	1	2	2	3	2	2	3	2	3	2	2

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Program	B.Sc. (Hons) MLT				
Year	II	Semester		III	
Course Name	Medical Law and Ethics				
Code	BML 303T				
Course Type	MD	L	T	P	Credit
Pre-Requisite		2	1	0	3
Course Objective	Explain the principles and importance of medical ethics and demonstrate professionalism through adherence to a healthcare code of conduct. Describe types of consent, their significance, and the management of medico-legal cases with legal compliance. Differentiate between malpractice and negligence and understand their ethical and legal implications in medical practice.				
Course Outcomes					
CO1	Explain the principles, need, and importance of medical ethics, and demonstrate professionalism through adherence to a proper code of conduct in healthcare practice.				
CO2	Explain types of consent and their importance, and understand medico-legal cases including proper consent and legal compliance in medical practice.				
CO3	Explain the difference between malpractice and negligence, and understand their ethical and legal implications.				

Module	Course Contents	Contact Hrs.	Mapped CO
1	Medical Ethics and Professional Conduct Medical ethics, Need and importance of medical ethics, Principles of medical ethics, Professionalism, Code of conduct and its importance, Attributes of code of conduct	15 Hours	CO1
2	Consent and Medico-Legal Understanding Consent, Types of consent, Importance of consent, Medico Legal Cases, Consent and management of MLC	15 Hours	CO2
3	Medical Malpractice and Negligence: Medical malpractice and negligence, Malpractice vs negligence, Ethical vs legal	15 Hours	CO3

Suggested Readings

1. B. Sandeepa Bhat, Reflections on Medical Law and Ethics in India, Eastern Law House
2. Subrata Sharma, Medical Ethics Challenges and prospects in India

Online Resources

1. <https://imlindia.com>

Course Articulation Matrix														
PO-PSO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	1	—	1	2	—	—	2	3	2	2	1	2	—	—
CO2	—	—	1	2	—	—	2	3	2	2	1	2	—	—
CO3	—	—	1	2	—	—	1	3	2	2	1	2	—	—



Program	B.Sc. (Hons) MLT				
Year	II	Semester		III	
Course Name	Sales and Marketing				
Code	BML 304T				
Course Type	AEC	L	T	P	Credit
Pre-Requisite		2	1	0	3
Course Objective	Understand the key elements, types, and processes involved in marketing health services. Analyze market segmentation, targeting, and positioning strategies relevant to healthcare Practice sales techniques and address challenges within healthcare marketing scenarios.				
Course Outcomes					
CO1	Explain the elements, types, and process of marketing in health services, including market segmentation benefits and bases.				
CO2	Develop effective market targeting and positioning strategies for health services.				
CO3	Describe the sales process and apply techniques for closing sales while addressing challenges in healthcare marketing.				

Module	Course Contents	Contact Hrs.	Mapped CO
1	Fundamentals of Health Services Marketing: Marketing in health services, Elements of marketing, Types of marketing mix, Process of marketing of health services, Market segmentation principles, benefits and bases for segmentation in healthcare	15 Hours	CO1
2	Market Targeting and Positioning in Healthcare: Market targeting and targeting strategies, Marketing positioning and positioning strategies,	15 Hours	CO2
3	Sales Techniques: Introduction to sales, sales processes, closing techniques, and challenges in sales.	15 Hours	CO3

Suggested Readings

1. Marketing Management, Philip Kotler and Kevin Lane Keller
2. Sales Management: Building Customer Relationships and Partnerships, Joseph F. Hair, Rolph E. Anderson, and Rajiv Mehta

Online Resources

1. <https://www.cancer.gov/publications/dictionaries/cancer-terms/def/copy>

Course Articulation Matrix														
PO-PSO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	1	—	1	—	—	—	2	2	2	3	1	3	—	—
CO2	1	—	1	—	—	—	2	2	2	3	1	3	—	—
CO3	1	—	2	—	—	—	2	2	2	2	1	3	—	—

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Program	B.Sc. (Hons) MLT				
Year	II	Semester		III	
Course Name	Job Ready Skills II				
Code	BML 305T				
Course Type	SEC	L	T	P	Credit
Pre-Requisite	Job Ready Skills I	2	0	0	2
Course Objective	Develop a positive mindset and apply emotional intelligence to manage interpersonal relationships effectively. Utilize stress management techniques and enhance negotiation skills for professional growth. Foster a result-oriented mindset to accomplish personal and organizational objectives.				
Course Outcomes					
CO1	Cultivate a positive mindset and demonstrate emotional intelligence to manage relationships effectively.				
CO2	Apply stress management techniques and develop negotiation skills for professional success.				
CO3	Adopt a result-oriented approach to achieve personal and organizational goals.				

Module	Course Contents	Contact Hrs.	Mapped CO
1	Positive Mindset and Emotional Intelligence: Introduction to positive mindset, Importance of positive mindset, Developing a positive mindset, Emotional quotient, Components of emotional intelligence	10 Hours	CO1
2	Stress Management and Negotiation Skills: Stress, Ways to manage stress, Negotiation and its outcomes, Ways to develop effective negotiation skills	10 Hours	CO2
3	Result Orientation: Introduction to result orientation, Ways to develop result oriented mindset	10 Hours	CO3

Suggested Readings

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1. Emotional Intelligence 2.0, Travis Bradberry and Jean Greaves
2. Mindset: The New Psychology of Success, Carol S. Dweck
3. S P Dhanavel, English and Soft Skills, Orient BlackSwan
4. Gupta Seema, Soft Skills - Interpersonal and Intrapersonal Skills Development, V&S Publishers

Online Resources

1. <https://www.mindtools.com>
2. <https://www.skillsyouneed.com>

Course Articulation Matrix														
PO-PSO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	—	—	—	—	—	—	2	3	3	2	2	3	—	—
CO2	—	—	—	—	—	—	2	2	2	3	3	3	—	—
CO3	—	—	—	—	—	—	2	2	2	3	3	3	—	—

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Program	B.Sc. (Hons) MLT				
Year	II	Semester		III	
Course Name	Advanced Medical Lab Techniques and Blood Banking Lab				
Code	BML 301P				
Course Type	DSC	L	T	P	Credit
Pre-Requisite	Basic Medical Lab Techniques and Blood Banking Lab	0	0	8	4
Course Objective	Perform key hematology tests for clinical evaluation. Operate glucometers and automatic analyzers accurately. Conduct biochemical estimations using standard methods. Execute pathological and serological tests for diagnosis.				
Course Outcomes					
CO1	Perform diagnostic tests using hematology and biochemistry analyzers, including hematocrit, reticulocyte count, sickle cell, PT/APTT, and bleeding/clotting time for evaluating hematological parameters.				
CO2	Demonstrate the ability to use point-of-care devices and fully automatic analyzers such as glucose meters and hematology analyzers for routine testing and accurate interpretation of results.				
CO3	Execute biochemical estimations like glucose (GOD/POD), urea (DAM), creatinine (Jaffe's), bilirubin, protein (Biuret), and serum amylase with precision and adherence to standard protocols.				
CO4	Conduct routine pathological and serological tests such as urinalysis, fecal occult blood, VDRL, Widal, and CRP to support clinical diagnosis and monitor disease condition				

S. No.	List of Experiments	
1	Use a glucometer to measure blood glucose	CO1
2	Conduct fecal occult blood test	CO4
3	Use a hematology analyzer for hematological testing	CO2
4	Determine hematocrit or packed cell volume	CO1
5	Conduct reticulocyte count test	CO1
6	Conduct sickle cell anemia test	CO1

7	Measure bleeding time and clotting time	CO1
8	Conduct PT and APTT tests	CO1
9	Run a test on a fully automatic analyzer	CO2
10	Carry out glucose estimation using GOD/POD method	CO3
11	Carry out urea estimation by DAM method	CO3
12	Carry out creatinine estimation by Jaffe's method	CO3
13	Measure total serum bilirubin test	CO3
14	Carry out protein estimation by Biuret method	CO3
15	Measure serum amylase	CO3
16	Conduct urinalysis	CO4
17	Conduct venereal disease research laboratory test	CO4
18	Conduct Widal test and CRP test	CO4

Suggested Readings

1. Provan, Baglin, Dokal, De Vos, Oxford handbook of clinical haematology,
2. Ramnik Sood, Medical Laboratory Technology (2 Vols. Set), Jaypee Brothers Medical Publishers (P) Ltd
3. Roger L. Lundblad, Fiona Macdonald, Handbook of Biochemistry and Molecular Biology
4. Abul K. Abbas, MBBS, Shiv Pillai, MBBS, PhD, Andrew H. Lichtman, MD, PhD, Basic Immunology E-Book, Functions and Disorders of the Immune System
5. Shirish M Kawthalkar, Essentials of Clinical Pathology, Jaypee brothers
6. Darshan P. Godkar, Praful B. Godkar, Textbook of Medical Laboratory Technology (Set of 2 Volumes) - Clinical Laboratory Science and Molecular Diagnosis
7. Amrita Rohilla, Handbook of Microbiology

Online Resources

1. <https://www.cdc.gov/labtraining/>
2. <https://pubmed.ncbi.nlm.nih.gov>
3. <https://bio.libretexts.org>
4. <https://www.immunology.org>
5. <https://www.hematology.org>
6. <https://main.icmr.nic.in>
7. <https://medlineplus.gov>

Course Articulation Matrix														
PO-PSO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2

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CO1	3	2	3	2	2	3	2	2	2	2	3	2	3	3
CO2	3	2	3	2	3	3	2	2	2	2	3	2	3	3
CO3	3	2	3	2	3	3	2	2	2	2	3	2	3	3
CO4	3	3	3	2	2	3	2	2	2	2	3	2	3	3

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Program	B.Sc. (Hons) MLT				
Year	II	Semester		III	
Course Name	Laboratory Management and Information System Lab				
Code	BML 302P				
Course Type	DSC	L	T	P	Credit
Pre-Requisite		0	0	6	3
Course Objective	Apply laboratory management principles to ensure effective planning, safety, and accurate documentation. Implement quality control and assurance practices while managing laboratory equipment efficiently. Utilize laboratory information systems, both manual and computerized, to support accreditation and data management.				
Course Outcomes					
CO1	Explain the importance of laboratory management, apply principles for effective planning and maintenance, follow safety guidelines, and maintain accurate laboratory documentation and records.				
CO2	Follow quality control and assurance methods and manage laboratory equipment effectively.				
CO3	Understand the role and importance of laboratory information systems in accreditation and effectively use both manual and computerized systems for laboratory information management.				

S. No.	List of Experiments	
1	Demonstration of Laboratory Safety Equipment	CO1
2	Lab Incident Report Writing	CO2
3	Manual Entry and Report Preparation Using Lab Forms	CO3

Suggested Readings

1. Laboratory quality management system: handbook, World Health Organization
2. Gerardus Blokdyk, Laboratory Information Management System LIMS Third Edition

Online Resources








1. <https://www.labmanager.com/science-lab-safety-rules-guidelines-5727>
2. <https://www.osha.gov/sites/default/files/publications/OSHA3404laboratory-safety-guidance.pdf>

Course Articulation Matrix														
PO-PSO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO 1	2	1	2	3	3	3	3	2	2	2	2	2	2	2
CO 2	1	—	1	3	3	3	3	2	2	2	2	2	1	1
CO 3	1	—	1	2	2	2	3	2	2	3	2	3	2	2

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Program	B.Sc. (Hons) MLT				
Year	II	Semester	IV		
Course Name	Molecular Biology and Cytogenetics				
Code	BML 401T				
Course Type	DSC	L	T	P	Credit
Pre-Requisite		3	1	0	4
Course Objective	To understand the fundamental components and functions of nucleic acids and enzymes involved in molecular biology. To comprehend the working principles and purposes of various blotting techniques used in molecular diagnostics. To gain knowledge about chromosome structure, cell division processes, and the basis of chromosomal abnormalities. To explore the methodologies of cytogenetic techniques and their importance in genetic analysis.				
Course Outcomes					
CO1	Explain the structure, synthesis, and functions of nucleic acids (DNA, RNA), including replication, transcription, translation, and the enzymes involved in these processes.				
CO2	Explain blotting techniques, including Southern, Northern, Western, and Dot blotting, and their applications.				
CO3	Understand chromosome structure, function, cell division processes, types of chromosomal abnormalities and their implications.				
CO4	Assist in techniques like chromosome banding, molecular cytogenetics, and advanced technologies in genetic analysis.				

Module	Course Contents	Contact Hrs.	Mapped CO
1	Introduction to Molecular Biology: Nucleic Acids, DNA, RNA, DNA synthesis, DNA replication, Transcription, Reverse transcription, Translation, Enzymes	15 Hours	CO1
2	Blotting Techniques: Southern blotting, Western blotting, Northern blotting, Dot blotting	15 Hours	CO2

3	Introduction to Cytogenetics: Chromosomes structure and function, Cell division, Chromosomal abnormalities	15 Hours	CO3
4	Cytogenetic Techniques: Chromosome banding, Molecular cytogenetics, Advanced technologies, Cytogenetics in cancer diagnostics, Cytogenetics in gynecology	15 Hours	CO4

Suggested Readings

1. Teitz, Fundamentals of Clinical Chemistry, 6th edition, Elsevier Publications
2. Lehninger, Principles of Biochemistry, 6th edition, W.H. Freeman
3. Kleinsmith, Principles Of Cancer Biology
4. Rao C. Vaman, Textbook of Cancer Biology
5. Rajiv Tyagi, Textbook of Cytogenetics
6. Ram Mahabal, Fundamentals of Cytogenetics and Genetics

Online Resources

1. <https://libguides.gsu.edu/cmb/website>
2. <https://www.thermofisher.com/in/en/home/brands/invitrogen/molecular-biology-technologies/mol-bio-school.html>

Course Articulation Matrix														
PO-PSO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	3	2	3	2	2	3	2	2	2	3	3	2	3	3
CO2	3	2	3	2	2	3	2	2	2	3	3	2	3	3
CO3	3	2	3	3	2	3	2	2	2	3	3	2	3	3
CO4	3	2	3	3	2	3	2	2	2	3	3	2	3	3

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Program	B.Sc. (Hons) MLT				
Year	II	Semester		IV	
Course Name	Cancer Diagnostics				
Code	BML 402T				
Course Type	DSC	L	T	P	Credit
Pre-Requisite		3	1	0	4
Course Objective	To introduce students to the basic biology of cancer, including types, causes, and cellular mechanisms involved in carcinogenesis. To familiarize students with the clinical presentation and common screening methods used in the early detection of various types of cancers. To enable students to understand and perform conventional diagnostic techniques, such as histopathology, cytology, and tumor marker evaluation used in cancer identification. To provide foundational knowledge of molecular and advanced diagnostic tools like PCR, FISH, and flow cytometry in the detection of genetic and hematologic malignancies.				
Course Outcomes					
CO1	Understand cancer biology and key types of cancers.				
CO2	Identify clinical features and use screening techniques for common cancers.				
CO3	Perform and assist in diagnostic procedures such as cytology, histology, and tumor marker assays.				
CO4	Gain exposure to molecular techniques used in advanced cancer diagnosis				

Module	Course Contents	Contact Hrs.	Mapped CO
1	Introduction to Cancer Biology: Definition and types of cancer (benign vs. malignant), Common causes and risk factors (genetic, environmental, lifestyle), Hallmarks of cancer (uncontrolled growth, invasion, metastasis), Basics of tumor biology and carcinogenesis	15 Hours	CO1
2	Common Cancers and Their Clinical Features: Overview of common cancers: breast, lung, cervical, prostate, colorectal, leukemia, Early warning signs and symptoms, Importance of early detection and routine screening, TNM staging and cancer grading	15 Hours	CO2

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3	Diagnostic Techniques in Cancer: Collection and handling of specimens (biopsy, blood, fluid samples), Histopathology: tissue processing, H&E staining, role in tumor diagnosis, Cytopathology: Pap smear, FNAC, exfoliative cytology, Immunohistochemistry (IHC) basics and its role in cancer diagnosis. Tumor markers (CEA, AFP, PSA, CA-125, etc.)	15 Hours	CO3
4	Molecular and Advanced Diagnostic Techniques: PCR and its role in cancer gene mutation detection, FISH (Fluorescence In Situ Hybridization), Flow cytometry in leukemia/lymphoma diagnosis	15 Hours	CO4

Suggested Readings

1. Venkateshwarlu, Mandalaju. 2021. *Cell Biology and Cytogenetics*. Kolhapur: Bhumi Publishing.
2. Liehr, Thomas, ed. 2022. *Cytogenetics and Molecular Cytogenetics*. Abingdon: Routledge.

Online Resources

1. <https://www.cancer.org/cancer.html>
2. <https://www.cancer.gov/about-cancer/understanding>

Course Articulation Matrix														
PO-PSO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	3	2	3	2	2	3	2	2	2	2	3	2	3	3
CO2	3	3	3	2	2	3	2	2	3	2	3	2	3	3
CO3	3	2	3	2	3	3	2	2	2	2	3	2	3	3
CO4	3	2	3	2	3	3	2	2	2	3	3	2	3	3

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Program	B.Sc. (Hons) MLT				
Year	II	Semester	IV		
Course Name	Advanced Histopathology				
Code	BML 403T				
Course Type	DSC	L	T	P	Credit
Pre-Requisite		2	2	0	4
Course Objective	Understand the working principles and components of automatic tissue processors. Explore innovations in tissue fixation, processing, embedding, and sectioning techniques. Gain knowledge of advanced staining methods and digital imaging technologies in histopathology. Identify common sectioning errors and learn techniques for their prevention and correction.				
Course Outcomes					
CO1	Explain the functions and operation of automatic tissue processors.				
CO2	Knowledge of recent advancements in histopathological tissue processing and embedding.				
CO3	Explain advanced staining techniques and digital imaging tools for accurate tissue analysis.				
CO4	Identify and prevent common sectioning errors to improve sample quality.				

Module	Course Contents	Contact Hrs.	Mapped CO
1	Automatic Tissue Processor: Introduction, Parts, Working principle, Processing time schedule	15 Hours	CO1
2	Advanced Techniques in Histopathology: Tissue fixation and processing innovations, Embedding and sectioning innovations, Advanced staining techniques, Digital imaging, AI in Histological image analysis, FISH	15 Hours	CO2
3	Advanced Histological Staining and Imaging:	15 Hours	CO3

	Advanced staining techniques, digital imaging, use of Artificial Intelligence (AI) in histological image analysis, Fluorescence in situ hybridization (FISH)		
4	Sectioning Errors and Remedies: Common sectioning errors, causes and identification, prevention and corrective actions	15 Hours	CO4

Suggested Readings

1. Kumar, Abbas, Aster, Robbins Basic Pathology, 10th edition, Elsevier Publications
2. Harsh Mohan, Textbook of Pathology, 8th edition, Jaypee Brothers Medical Publishers
3. Vinay Kumar, Abul K. Abbas, Nelson Fausto, Robbin's Pathologic Basis of Disease, 9th edition, Elsevier Publications
4. B. S. Nagoba, Histopathology Techniques and Practical Guide, 1st edition, Jaypee Brothers Medical Publishers

Online Resources

1. <https://webpath.med.utah.edu>
2. <https://www.pathologyoutlines.com>

Course Articulation Matrix														
PO-PSO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	3	2	2	2	3	3	2	—	2	2	2	2	3	2
CO2	3	—	2	1	3	2	—	—	1	3	2	2	3	2
CO3	3	—	3	1	3	3	2	—	2	3	3	2	3	3
CO4	3	—	3	2	3	3	2	—	2	2	3	2	3	3

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Program	B.Sc. (Hons) MLT				
Year	II	Semester		IV	
Course Name	Advanced Cytopathology				
Code	BML 404T				
Course Type	DSC	L	T	P	Credit
Pre-Requisite		2	0	0	2
Course Objective	Understand the purpose and steps involved in cytological sample collection and FNAC for diagnostic use. Understand the methodology and diagnostic significance of PAP and MGG staining in cytological evaluations. Understand common cytology staining errors and how to differentiate benign from malignant features under the microscope.				
Course Outcomes					
CO1	Explain the methods of cytological sample collection and describe their role in clinical diagnosis, including FNAC procedures.				
CO2	Describe the principles, procedures, and applications of PAP and MGG staining techniques used in cytology.				
CO3	Identify common staining errors and explain how to optimize stain quality and interpret benign vs malignant cytological findings.				

Module	Course Contents	Contact Hrs.	Mapped CO
1	Cytological Sample Collection and Preparation: Principles of cytological examination, Methods of sample collection (e.g., exfoliative cytology, FNAC), Fixation and smear preparation techniques, Factors affecting sample quality	10 Hours	CO1
2	PAP and MGG Staining Techniques: Introduction to staining in cytology, PAP staining: procedure, reagents, and clinical significance, MGG staining: steps, reagents, and diagnostic utility, Comparison between PAP and MGG techniques, Applications in screening and diagnosis	10 Hours	CO2
3	Staining Quality, Troubleshooting, and Interpretation: Common staining errors and artifacts, Methods to troubleshoot and optimize stain quality, Criteria to differentiate benign and malignant cells, Slide interpretation and clinical significance	10 Hours	CO3









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Suggested Readings

1. Harsh Mohan, Practical Cytopathology, 3rd edition, Jaypee Brothers Medical Publishers
2. Shirish S. Dighe, Cytopathology: Principles and Practice, 1st edition, Jaypee Brothers Medical Publishers
3. R. S. Nayar and D. Wilbur, The Bethesda System for Reporting Cervical Cytology, 3rd edition, Springer
4. S. N. Shukla, Manual of Cytopathology, 1st edition, CBS Publishers

Online Resources

1. <https://www.cytology-iac.org/educational-resources/>
2. <https://elearning.virtualpathology.leeds.ac.uk/st1.php?subject=Cytology>

Course Articulation Matrix														
PO-PSO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	3	3	3	2	2	2	2	1	2	2	2	2	3	3
CO2	3	—	3	1	3	3	2	—	2	2	2	2	3	3
CO3	3	—	3	2	3	3	2	—	2	2	3	2	3	3

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Program	B.Sc. (Hons) MLT				
Year	II	Semester	IV		
Course Name	Leadership Skills for Business Success				
Code	BML 405T				
Course Type	AEC	L	T	P	Credit
Pre-Requisite		2	0	0	2
Course Objective	To develop a strong sense of ownership and responsibility, encouraging learners to be accountable and proactive in both personal and professional settings while promoting adaptability through a growth mindset. To equip learners with interpersonal and leadership skills, including conflict resolution, openness to feedback, initiative-taking, strategic thinking, and mentoring in diverse environments. To foster an entrepreneurial mindset, nurturing a bias for action and enhancing creative problem-solving abilities needed for innovation and success in dynamic contexts.				
Course Outcomes					
CO1	Demonstrate ownership and a growth mindset by taking initiative, embracing challenges, adapting to change, and being accountable for tasks.				
CO2	Apply effective interpersonal and leadership skills by managing conflicts constructively, showing openness to feedback, mentoring others, and thinking strategically.				
CO3	Exhibit entrepreneurial thinking by taking proactive action and solving problems innovatively in personal and professional contexts.				

Module	Course Contents	Contact Hrs.	Mapped CO
1	Personal Ownership and Growth Mindset: Ownership, Taking ownership, Ways to develop ownership, Fixed mindset vs Growth mindset, Ways to develop a growth mindset, Adaptability	10 Hours	CO1
2	Conflict and Leadership Skills: Conflict, Types of conflicts, Ways to manage conflicts, Openness to feedback, Taking initiative, Strategic thinking skills, Mentoring skills	10 Hours	CO2

3	Entrepreneurial Mindset and Problem Solving Entrepreneurial mindset: bias for action, Importance of problem-solving in leadership and innovation, Integrating ownership and growth mindset into entrepreneurial thinking	10 Hours	CO3
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Suggested Readings

1. The Five Dysfunctions of a Team: A Leadership Fable, Patrick Lencioni
2. Getting Things Done: The Art of Stress-Free Productivity, David Allen

Online Resources

1. <https://www.mindtools.com>
2. <https://www.skillsyouneed.com>

Course Articulation Matrix														
PO-PSO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	—	—	—	2	—	—	2	3	2	3	3	3	—	—
CO2	—	—	—	2	—	—	2	3	3	3	3	3	—	—
CO3	—	—	2	1	—	—	2	3	2	3	3	3	—	—

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Program	B.Sc. (Hons) MLT				
Year	II	Semester	IV		
Course Name	Molecular Biology and Cytogenetics Lab				
Code	BML 401P				
Course Type	DSC	L	T	P	Credit
Pre-Requisite		0	0	8	4
Course Objective	To help learners understand the methodology and purpose of preparing human karyotypes. To enable learners to comprehend each stage of mitosis using onion tip cells as a model. To familiarize students with microscopic identification and classification of chromosomes. To support learners in understanding how karyotyping is applied to real clinical scenarios involving chromosomal disorders.				
Course Outcomes					
CO1	Explain the procedure for preparing human karyotypes and their clinical relevance.				
CO2	Describe the stages of mitosis observed in onion root tip cells.				
CO3	Identify different types of human chromosomes under the microscope and explain their characteristics.				
CO4	Interpret human karyotype-based case studies to understand chromosomal abnormalities.				

S. No.	List of Experiments	
1	Prepare human karyotypes	CO1
2	Study mitosis in onion tip cells	CO2
3	Study chromosomes under the microscope	CO3
4	Study clinical case studies using human karyotypes	CO4

Suggested Readings

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1. Teitz, Fundamentals of Clinical Chemistry, 6th edition, Elsevier Publications
2. Lehninger, Principles of Biochemistry, 6th edition, W.H. Freeman
3. Kleinsmith, Principles Of Cancer Biology
4. Rao C. Vaman, Textbook of Cancer Biology
5. Rajiv Tyagi, Textbook of Cytogenetics
6. Ram Mahabal, Fundamentals of Cytogenetics and Genetics

Online Resources

1. <https://libguides.gvsu.edu/cmb/website>
2. <https://www.thermofisher.com/in/en/home/brands/invitrogen/molecular-biology-technologies/mol-bio-school.html>

Course Articulation Matrix														
PO-PSO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	3	—	3	2	3	2	2	—	2	2	3	2	3	3
CO2	2	—	2	2	2	1	1	—	—	2	2	1	2	2
CO3	3	—	2	2	2	2	2	—	—	2	2	2	2	2
CO4	3	—	3	2	2	2	2	—	2	3	3	2	3	3

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Program	B.Sc. (Hons) MLT				
Year	II	Semester		IV	
Course Name	Advanced Cytopathology Lab				
Code	BML 402P				
Course Type	DSC	L	T	P	Credit
Pre-Requisite		0	0	4	2
Course Objective	Understand the steps involved in preparing cytological smears Explain the fixation techniques and their effects on cytological smears using various fixatives and fixation timings Describe the principles and application of PAP and MGG staining techniques				
Course Outcomes					
CO1	Explain the process and purpose of simulated smear preparation for cytological analysis.				
CO2	Differentiate between appropriate and inappropriate fixation results based on smear quality and timing				
CO3	Interpret stained non-clinical cytology slides and identify cellular structures using PAP and MGG methods.				

S. No.	List of Experiments	
1	Preparation of simulated cytological Smears using artificial samples (gel-based or plant cells) to mimic cytological material	CO1
2	Hands-on fixation of smears using methanol, ethanol, and spray fixative	CO2
3	Timing and impact of under/over-fixation	CO2
4	Papanicolaou (PAP) stain using dummy samples	CO3
5	May-Grünwald Giemsa (MGG) stain on plant and cheek epithelial cells	CO3
6	Identification of cell structures using cheek smear and onion peel	CO3

Suggested Readings

1. Harsh Mohan, Practical Cytopathology, 3rd edition, Jaypee Brothers Medical Publishers

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2. Shirish S. Dighe, Cytopathology: Principles and Practice, 1st edition, Jaypee Brothers Medical Publishers
3. R. S. Nayar and D. Wilbur, The Bethesda System for Reporting Cervical Cytology, 3rd edition, Springer
4. S. N. Shukla, Manual of Cytopathology, 1st edition, CBS Publishers

Online Resources

1. <https://www.cytology-iac.org/educational-resources/>
2. <https://elearning.virtualpathology.leeds.ac.uk/st1.php?subject=Cytology>

Course Articulation Matrix														
PO-PSO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	3	—	2	2	3	2	2	—	—	2	2	1	3	2
CO2	2	—	2	2	2	2	2	—	—	2	2	1	2	2
CO3	3	—	3	2	2	2	2	—	—	2	2	2	3	3

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Program	B.Sc. (Hons) MLT				
Year	III	Semester		V	
Course Name	Phlebotomy Techniques				
Code	BML 501P				
Course Type	DSC	L	T	P	Credit
Pre-Requisite		0	0	24	12
Course Objective	Explain the roles and responsibilities of a phlebotomist and understand pre-analytical variables and patient preparation. Describe the procedures for venipuncture and capillary collection. Identify appropriate equipment used for blood collection. Understand the protocols for post-procedure care and error handling.				
Course Outcomes					
CO1	Describe the anatomy relevant to phlebotomy and prepare patients effectively for blood collection				
CO2	Demonstrate proper venipuncture and capillary blood collection techniques and select appropriate equipment for blood collection.				
CO3	Apply correct procedures for sample handling, labelling, transportation, and				
CO4	Implement safety protocols while managing complications effectively.				

Module	Course Contents	Contact Hrs.	Mapped CO
1	Introduction to Phlebotomy and Patient Preparation: Definition, scope, anatomy of veins and blood vessels, patient identification, and psychological preparation.	90 Hours	CO1
2	Venipuncture Techniques and Capillary Puncture: Types of venipuncture, site selection, equipment (needles, syringes, vacuum tubes, tourniquet), and capillary blood collection methods including lancets and heel sticks.	90 Hours	CO2
3	Sample Handling, Labelling, and Transportation: Proper sample labelling, storage, transportation protocols, and maintaining sample integrity.	90 Hours	CO3
4	Safety Measures and Complication Management:	90 Hours	CO4

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	Biosafety protocols, prevention of needle-stick injuries, management of complications like hematomas and fainting, and sharps disposal.		
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Suggested Readings

1. Ramnik Sood, Medical Laboratory Technology, Jaypee Publications
2. KL Goyal, Manual of Practical Medicine, CBS Publishers
3. WHO Guidelines on Drawing Blood

Course Articulation Matrix														
PO-PSO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	3	2	2	2	—	—	2	2	2	1	2	2	3	2
CO2	3	3	3	3	3	2	2	2	2	—	2	2	3	3
CO3	3	3	3	2	2	3	3	2	2	—	2	2	3	3
CO4	2	2	2	3	2	2	2	2	2	—	3	2	2	2

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Program	B.Sc. (Hons) MLT				
Year	III	Semester		V	
Course Name	Managing Medical Emergencies				
Code	BML 502P				
Course Type	DSC	L	T	P	Credit
Pre-Requisite		0	0	12	6
Course Objective	Understand the importance of timely response in medical emergencies. Learn basic resuscitation and life support techniques. Identify signs of critical medical conditions. Explain first aid for common injuries.				
Course Outcomes					
CO1	Explain the basic principles of emergency medical response.				
CO2	Demonstrate understanding of CPR and life-saving protocols.				
CO3	Identify signs of common emergency conditions.				
CO4	Describe appropriate first aid interventions.				

Module	Course Contents	Contact Hrs.	Mapped CO
1	Introduction to Emergency Medical Services: Definition and types of medical emergencies, assessment and prioritization, basic life support principle	45 Hours	CO1
2	CPR, Defibrillation, and Basic Life Support: Recognition and management of cardiac arrest, respiratory distress, airway obstruction.	45 Hours	CO2
3	Emergency Response to Bleeding and Shock: Types of trauma, hemorrhage control, types and stages of shock, initial stabilization.	45 Hours	CO3
4	Management of Burns, Fractures: Types of fractures and burns, principles of fracture immobilization and first aid, burn classification and treatment, pain management, infection prevention, and wound care.	45 Hours	CO4







Suggested Readings

1. American Heart Association, BLS Provider Manual
2. First Aid Manual, Indian Red Cross Society
3. Satish Chandra, Essentials of Emergency Medicine, Jaypee Brothers

Course Articulation Matrix														
PO-PSO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	3	2	2	2	—	—	2	2	2	1	2	2	3	2
CO2	3	3	3	3	3	2	2	2	2	—	2	2	3	3
CO3	3	3	3	2	2	3	3	2	2	—	2	2	3	3
CO4	2	2	2	3	2	2	2	2	2	—	3	2	2	2

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Program	B.Sc. (Hons) MLT				
Year	III	Semester	V		
Course Name	Summer Internship				
Code	BML 503P				
Course Type	DSC	L	T	P	Credit
Pre-Requisite		0	0	4	2
Course Objectives	Apply theoretical knowledge in a real-world work environment to develop practical skills and professional competence. Enhance communication, teamwork, and problem-solving abilities through active participation in organizational tasks and projects. Understand workplace culture, ethics, and professional responsibilities to prepare for future career opportunities.				
Course Outcomes					
CO1	Demonstrate the ability to perform job-related tasks effectively by applying academic concepts to practical scenarios.				
CO2	Exhibit improved interpersonal and professional skills, including communication, collaboration, and adaptability in a work setting.				
CO3	Reflect on the internship experience to identify personal strengths, areas for improvement, and career goals.				








Program	B.Sc. (Hons) MLT				
Year	III	Semester		VI	
Course Name	Infection Control Practices				
Code	BML 601P				
Course Type	DSC	L	T	P	Credit
Pre-Requisite		0	0	24	12
Course Objectives	Understand the types of infectious agents, their modes of transmission, and the significance of standard precautions in healthcare. Apply sterilization and disinfection methods appropriately to ensure infection-free clinical environments. Demonstrate correct usage of PPE, including donning, doffing, and disposal, as part of infection prevention practices. Identify hospital-acquired infections (HAIs) and implement biomedical waste management techniques following regulatory standards.				
Course Outcomes					
CO1	Describe infectious agents and implement standard precautions such as hand hygiene and respiratory etiquette.				
CO2	Apply suitable sterilization and disinfection methods based on the type of equipment and setting.				
CO3	Demonstrate the correct selection, usage, and disposal of PPE in clinical situations.				
CO4	Identify common HAIs and manage biomedical waste using color-coded segregation and safe disposal practices.				

Module	Course Contents	Contact Hrs.	Mapped CO
1	Introduction to Infection and Standard Precautions: Overview of infectious agents (bacteria, viruses, fungi, parasites), modes of transmission (contact, droplet, airborne), and the significance of infection control in healthcare settings., Principles of standard precautions, handwashing techniques, hand sanitizers, respiratory hygiene, and cough etiquette.	90 Hours	CO1

2	Sterilization and Disinfection: Methods of sterilization (autoclaving, dry heat, chemical sterilants), disinfection techniques, and selection of appropriate disinfectants.	90 Hours	CO2
3	Use of Personal Protective Equipment (PPE): Types of PPE (gloves, gowns, masks, eye protection), proper donning and doffing procedures, and disposal protocols.	90 Hours	CO3
4	Hospital-Acquired Infections and Waste Management: Common HAIs, prevention strategies, biomedical waste segregation, handling, and disposal in compliance with regulatory guidelines.	90 Hours	CO4

Suggested Readings

1. Kamaluddin A. et al., Infection Control in Healthcare Settings, 3rd Edition, Jaypee Publications
2. Shrivastava P.S., Textbook of Infection Control and Hospital Hygiene, 2nd Edition, Elsevier India
3. Parikh C.R., Infection Control in Clinical Laboratories, 1st Edition, CBS Publishers
4. WHO Guidelines on Hand Hygiene in Healthcare, 2009

Course Articulation Matrix														
PO-PSO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	2	2	2	3	—	—	2	2	—	—	2	2	2	—
CO2	3	—	2	3	2	3	—	2	—	—	2	—	2	—
CO3	2	—	1	3	—	—	—	2	—	—	1	—	2	—
CO4	2	—	2	3	—	2	2	2	—	—	2	—	2	—

Program	B.Sc. (Hons) MLT				
Year	III	Semester		VI	
Course Name	Haematology Laboratory Techniques				
Code	BI 4L 602P				
Course Type	DSC	L	T	P	Credit
Pre-Requisite		0	0	12	06
Course Objectives	Understand the composition, functions, and formation of blood components along with their normal physiological ranges. Gain skills in identifying blood cell morphology and performing common staining techniques for microscopic evaluation. Develop the ability to perform and interpret routine hematological investigations and identify common blood disorders. Apply knowledge of advanced hematology tools, including automation and quality control procedures in laboratory settings.				
Course Outcomes					
CO1	Describe the components and functions of blood, explain hematopoiesis, and interpret normal blood values				
CO2	Identify blood cells under a microscope and demonstrate blood smear preparation using Leishman's and Wright's stains				
CO3	Perform complete blood counts, differential counts, hemoglobin estimation, and diagnose common hematological conditions.				
CO4	Operate automated hematology analyzers and apply quality control measures in conducting advanced haematological tests.				

Module	Course Contents	Contact Hrs.	Mapped CO
1	Fundamentals of Haematology: Composition and functions of blood, Hematopoiesis and blood cell formation, Normal ranges and physiological variations of blood components	45 Hours	CO1
2	Blood Cell Morphology and Staining Techniques: Morphology of RBCs, WBCs, and platelets, Preparation and examination of peripheral blood smears, Common staining techniques: Leishman's, Wright's stain	45 Hours	CO2

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3	Haematological Investigations and Laboratory Diagnosis: CBC, hemoglobin estimation, hematocrit, TLC, DLC, Reticulocyte count, ESR, Laboratory diagnosis of anemia, leukemia, clotting disorders, and hemoglobinopathies	45 Hours	CO3
4	Automation and Advanced Techniques in Haematology: Introduction to automated hematology analyzers, Bone marrow examination basics, Quality control in hematology labs, Safety and standard operating procedures	45 Hours	CO4

Suggested Readings

1. Dacie J.V. and Lewis S.M., Practical Haematology, 12th Edition, Elsevier
2. Kumar R. and Clark M., Clinical Medicine (Hematology Section), 10th Edition, Elsevier
3. McKenzie S.B., Hematology: Clinical Principles and Applications, 7th Edition, Elsevier
4. Bain B.J., Blood Cells: A Practical Guide, 5th Edition, Wiley-Blackwell

Course Articulation Matrix														
PO-PSO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	3	—	2	—	—	—	2	—	—	2	—	2	3	3
CO2	3	—	2	—	2	—	—	—	—	—	—	—	3	2
CO3	3	2	3	2	2	3	2	—	—	—	2	—	3	3
CO4	3	—	3	2	3	3	2	—	—	2	3	—	3	3

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Program	B.Sc. (Hons) MLT				
Year	III	Semester		VI	
Course Name	Internship				
Code	BML 603P				
Course Type	DSC	L	T	P	Credit
Pre-Requisite		0	0	4	2
Course Objectives	Apply theoretical knowledge in a real-world work environment to develop practical skills and professional competence. Enhance communication, teamwork, and problem-solving abilities through active participation in organizational tasks and projects. Understand workplace culture, ethics, and professional responsibilities to prepare for future career opportunities.				
Course Outcomes					
CO1	Demonstrate the ability to perform job-related tasks effectively by applying academic concepts to practical scenarios.				
CO2	Exhibit improved interpersonal and professional skills, including communication, collaboration, and adaptability in a work setting.				
CO3	Reflect on the internship experience to identify personal strengths, areas for improvement, and career goals.				








Program	B.Sc. (Hons) MLT				
Year	IV	Semester		VII	
Course Name	Blood Banking Procedures				
Code	BML 701P				
Course Type	DSC	L	T	P	Credit
Pre-Requisite		0	0	24	12
Course Objectives	Describe the major blood group systems and their clinical significance. Apply criteria for donor selection and proper blood collection techniques. Perform blood grouping, antibody screening, compatibility testing, preparation, storage, and understands clinical use of blood components. Recognize transfusion reactions and implement quality control measures in blood banking.				
Course Outcomes					
CO1	Explain the principles of blood group systems and their importance in transfusion.				
CO2	Conduct donor screening and blood collection following standard protocols.				
CO3	Carry out accurate blood typing, crossmatching tests, blood component preparation.				
CO4	Identify transfusion reactions promptly and understand quality assurance in blood banking.				

Module	Course Contents	Contact Hrs.	Mapped CO
1	Introduction to Blood Banking and Blood Group Systems: Basics of blood banking, history, importance; ABO and Rh blood group systems; other clinically significant blood group antigens.	90 Hours	CO1
2	Blood Donor Selection and Blood Collection: Criteria for donor eligibility, donor screening, blood collection techniques, storage and preservation of blood components.	90 Hours	CO2
3	Compatibility Testing and Component Preparation: Principles and procedures for blood grouping, antibody screening, and crossmatching to ensure transfusion safety.	90 Hours	CO3

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	Preparation of packed red cells, platelets, plasma, cryoprecipitate: indications and clinical applications		
4	Transfusion Reactions and Quality Control: Types of transfusion reactions, their recognition and management; laboratory quality assurance and regulatory guidelines in Blood banking.	90 Hours	CO4

Suggested Readings

1. AABB Technical Manual, 20th Edition, AABB Press
2. Harmening, Donor and Blood Bank Technology, 6th Edition, F.A. Davis
3. Stuart M. and Barbara J., Modern Blood Banking & Transfusion Practices, 6th Edition, F.A. Davis
4. Bain B.J., Blood Groups and Red Cell Antigens, 3rd Edition, Wiley-Blackwell

Course Articulation Matrix														
PO-PSO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	3	—	2	—	—	3	2	2	—	2	2	2	3	3
CO2	3	3	2	2	2	3	2	2	—	—	2	2	3	3
CO3	3	3	3	2	3	3	2	2	—	2	3	2	3	3
CO4	3	2	3	2	2	3	3	2	—	2	3	2	3	3

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Program	B.Sc. (Hons) MLT				
Year	IV	Semester		VII	
Course Name	Clinical Pathology				
Code	BML 702P				
Course Type	DSC	L	T	P	Credit
Pre-Requisite		0	0	16	08
Course Objectives	Describe the scope and importance of clinical pathology in disease diagnosis. Perform proper collection, handling of clinical specimens, hematological investigations and interpret peripheral smear results. Analyze urine and other body fluids using physical, chemical, and microscopic methods. Apply quality control measures and adhere to safety protocols in clinical pathology lab				
Course Outcomes					
CO1	Explain the procedures for collection and processing of various clinical specimens.				
CO2	Prepare and analyze peripheral blood smears for hematological evaluation and perform urinalysis and body fluid examination using standard laboratory techniques.				
CO3	Interpret biochemical analysis of body fluids for clinical relevance.				
CO4	Demonstrate adherence to laboratory quality assurance and safety standards.				

Module	Course Contents	Contact Hrs.	Mapped CO
I	Introduction to Clinical Pathology and Sample Collection: Overview of clinical pathology, types of clinical specimens, principles of proper sample collection, labeling, and transportation.	60 Hours	CO1

2	Hematological and Urinalysis Procedures: Analysis of blood parameters, peripheral blood smear preparation, complete blood count (CBC), and interpretation of hematological findings, Techniques for physical, chemical, and microscopic examination of urine and other body fluids like cerebrospinal fluid, pleural fluid.	60 Hours	CO2
3	Biochemical Analysis of Body Fluids: Measurement of biochemical markers in fluids, understanding their clinical relevance in disease diagnosis	60 Hours	CO3
4	Quality Control and Safety in Clinical Pathology Laboratory: Implementation of quality control measures, lab safety protocols, and good laboratory practices in clinical pathology.	60 Hours	CO4

Suggested Readings

1. Dacie J.V. and Lewis S.M., Practical Haematology, 12th Edition, Elsevier
2. Kumar R. and Clark M., Clinical Medicine (Hematology Section), 10th Edition, Elsevier
3. McKenzie S.B., Hematology: Clinical Principles and Applications, 7th Edition, Elsevier
4. Bain B.J., Blood Cells: A Practical Guide, 5th Edition, Wiley-Blackwell

Course Articulation Matrix														
PO-PSO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	3	3	2	2	2	3	2	—	—	—	—	—	3	3
CO2	3	—	3	—	2	3	2	—	—	—	—	—	3	3
CO3	3	—	3	—	2	3	2	—	—	—	—	—	3	3
CO4	3	—	3	2	2	3	3	—	—	2	—	—	3	3

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Program	B.Sc. (Hons) MLT				
Year	IV	Semester		VIII	
Course Name	Laboratory Management				
Code	BML 801P				
Course Type	DSC	L	T	P	Credit
Pre-Requisite		0	0	16	08
Course Objectives	Understand the key functions and organization of a clinical laboratory. Explore Laboratory Information Management Systems (LIMS) and digital data management in clinical settings. Comprehend the phases of laboratory testing and the role of quality control in each phase. Learn safety protocols to manage biological, chemical, and electrical hazards in the laboratory.				
Course Outcomes					
CO1	Describe the organizational structure and workflow of clinical laboratories.				
CO2	Use Laboratory Information Management Systems for data entry, management, and reporting..				
CO3	Identify and apply quality control measures in the pre-analytical, analytical, and post-analytical phases of testing.				
CO4	Demonstrate knowledge of laboratory safety principles and implement appropriate safety measures.				

Module	Course Contents	Contact Hrs.	Mapped CO
1	Introduction to Laboratory Management: Overview of laboratory functions, organizational structure, types of clinical laboratories, workflow processes, roles and responsibilities of laboratory staff.	60 Hours	CO1








2	Laboratory Information Systems and Data Management: Introduction to Laboratory Information Management Systems (LIMS), digital record-keeping, patient data confidentiality, report generation, integration with hospital information systems, and troubleshooting common issues.	60 Hours	CO2
3	Phases of Laboratory Testing and Quality Control: Detailed discussion on pre-analytical, analytical, and post-analytical phases; common sources of errors; introduction to internal and external quality control procedures; role of accreditation and standardization.	60 Hours	CO3
4	Laboratory Safety and Hazard Management: Principles of laboratory safety, biological, chemical, and electrical hazards; use and disposal of personal protective equipment (PPE); handling of spills, waste segregation, emergency protocols.	60 Hours	CO4

Suggested Readings

1. Clinical Laboratory Management: Principles and Practice, Kanthaswamy K.
2. Laboratory Management: Principles and Processes, Denise M. Harmening, 2nd Edition, Pearson Education
3. Clinical Laboratory Science: The Basics and Routine Techniques, Jean Jorgenson Linné, 6th Edition, Elsevier
4. Laboratory Quality Management System: Handbook, WHO Publications

Course Articulation Matrix														
PO-PSO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	2	1	2	1	1	2	3	1	1	1	1	2	2	2
CO2	2	2	3	1	2	3	3	1	1	2	1	3	3	3
CO3	3	2	3	1	2	3	3	1	1	2	2	2	3	3
CO4	1	1	1	3	1	2	2	3	1	1	1	2	1	1

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Program	B. Sc. (Hons) MLT				
Year	IV	Semester		VIII	
Course Name	Clinical Biochemistry				
Code	BML 802P				
Course Type	DSC/RP	L	T	P	Credit
Pre-Requisite		0	0	8	4
Course Objectives	Understand the basic biochemical principles related to human body fluids and metabolism. Describe biochemical parameters used in diagnosing common diseases. Learn the methodology and principles behind routine clinical biochemistry tests. Recognize the importance of quality control and safety in clinical biochemistry laboratories.				
Course Outcomes					
CO1	Explain the biochemical composition and function of body fluids such as blood, urine, and cerebrospinal fluid.				
CO2	Describe the biochemical basis of disorders such as diabetes, liver disease, renal failure, and lipid disorders.				
CO3	Perform and explain routine biochemical tests including glucose estimation, liver function tests, renal function tests, and lipid profiles.				
CO4	Apply laboratory safety protocols and quality control measures during biochemical testing.				

Module	Course Contents	Contact Hrs.	Mapped CO
1	Introduction to Clinical Biochemistry and Body Fluids: Overview of clinical biochemistry, biochemical composition of blood, urine, cerebrospinal fluid, and other body fluids. Role of enzymes, hormones, and electrolytes in maintaining homeostasis.	30 Hours	CO1
2	Carbohydrate and Protein Metabolism Tests: Principles and procedures for glucose estimation (GOD-POD method), glycated hemoglobin, and tests for protein estimation (Biuret method), total protein, albumin, and globulin ratio.	30 Hours	CO2

3	Lipid Profile and Enzyme Assays: Tests for total cholesterol, HDL, LDL, triglycerides, and enzyme assays (serum amylase, lipase). Clinical significance and sample handling for lipid analysis.	30 Hours	CO3
4	Quality Control and Safety in Clinical Biochemistry: Importance of internal and external quality control, calibration of instruments, reagent quality, safety practices in handling chemicals and biological samples, and waste disposal.	30 Hours	CO4

Suggested Readings

1. Tietz Textbook of Clinical Chemistry and Molecular Diagnostics, Carl A. Burtis, David E. Bruns, 5th Edition, Elsevier
2. Clinical Chemistry: Principles, Procedures, Correlations, Michael L. Bishop, 7th Edition, Lippincott Williams & Wilkin
3. Fundamentals of Clinical Chemistry, Norbert W. Tietz, 5th Edition, Saunders
4. Clinical Biochemistry Made Easy, Catherine Willey, 4th Edition, Elsevier

Course Articulation Matrix														
PO-PSO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	3	—	2	—	—	—	—	—	—	2	—	—	2	2
CO2	3	—	3	—	—	—	—	—	—	2	—	—	2	3
CO3	3	—	3	—	2	3	2	—	—	2	—	—	3	3
CO4	2	—	2	2	2	3	3	—	—	2	—	—	3	3

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Program	B.Sc. (Hons) MLT				
Year	IV	Semester	VIII		
Course Name	Immunology and Serology Procedures				
Code	BML 803P				
Course Type	DSC/RP	L	T	P	Credit
Pre-Requisite		0	0	8	04
Course Objectives	Understand the fundamental components and functions of the immune system. Learn the basis of antigen-antibody reactions and their application in serological testing. Understand common infectious and autoimmune diseases detectable by serological methods. Become familiar with key serological techniques such as agglutination, precipitation, and ELISA.				
Course Outcomes					
CO1	Identify the components of the immune system and explain their functions				
CO2	Describe the principles behind antigen-antibody reactions used in diagnostic tests.				
CO3	Perform basic serological tests such as Widal, VDRL, CRP, and Rheumatoid Factor				
CO4	Interpret test results and relate them to specific immune or infectious conditions.				

Module	Course Contents	Contact Hrs.	Mapped CO
1	Basics of Immunology: Overview of innate and adaptive immunity, immune cells (T-cells, B-cells, macrophages), immune organs (thymus, spleen, lymph nodes), and the function of antibodies and antigens.	30 Hours	CO1

2	Antigen-Antibody Reactions: Principles and types of antigen-antibody reactions – agglutination, precipitation, neutralization, complement fixation. Factors affecting the strength and specificity of reactions.	30 Hours	CO2
3	Serological Techniques: Qualitative and quantitative tests: slide agglutination, tube agglutination (Widal test), flocculation (VDRL), C-reactive protein (CRP), and latex agglutination. Introduction to immunoassays like ELISA and rapid diagnostic tests (RDTs).	30 Hours	CO3
4	Clinical Applications of Serology: Interpretation of results for infectious diseases (typhoid, syphilis, hepatitis, HIV) and autoimmune conditions (RA, SLE). Importance of quality control in diagnosis.	30 Hours	CO4

Suggested Readings

1. Immunology by Kuby, Kindt, Goldsby, and Osborne – 7th Edition
2. Immunology & Serology in Laboratory Medicine, Mary Louise Turgeon – 5th Edition
3. Textbook of Microbiology by Ananthanarayan and Paniker – Serology Sections
4. Essentials of Immunology, Roitt, Brostoff, and Male – 13th Edition

Course Articulation Matrix														
PO-PSO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	3	1	2	1	–	–	–	–	1	2	1	1	3	3
CO2	3	1	3	1	–	2	2	–	2	2	1	2	3	3
CO3	3	2	3	1	1	3	3	–	2	2	1	2	3	3
CO4	3	1	3	1	1	3	3	–	2	2	2	2	3	3

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Program	B.Sc. (Hons) MLT				
Year	IV	Semester	VIII		
Course Name	Microbiology Techniques				
Code	BML 804P				
Course Type	DSC/RP	L	T	P	Credit
Pre-Requisite		0	0	8	04
Course Objectives	To understand the morphology, classification, and basic biology of microorganisms. To explore common culture methods, media, and identification techniques. To understand the microbial causes of human infections and their diagnostic methods. To understand and apply the principles of sterilization, disinfection, and biosafety, along with microbial sensitivity testing and antibiotic resistance to ensure safe and effective laboratory practices.				
Course Outcomes					
CO1	Identify common microorganisms and understand their characteristics.				
CO2	Explain the principles of microbial culture, staining, and microscopy.				
CO3	Describe the role of microorganisms in infectious diseases.				
CO4	Demonstrate knowledge of sterilization, disinfection, and laboratory safety, and interpret antimicrobial susceptibility test results to ensure infection control and accurate clinical decision-making.				

Module	Course Contents	Contact Hrs.	Mapped CO
1	Introduction to Microbiology and Microorganisms: Classification of microorganisms – bacteria, viruses, fungi, protozoa. General properties of bacteria (shape, arrangement, spores, flagella). Introduction to pathogenic and non-pathogenic organisms.	30 Hours	CO1

2	Culture Techniques, Microscopy, and Staining: Types of culture media – nutrient agar, selective and differential media. Inoculation techniques, incubation, and observation. Use and care of microscopes. Wet mount and Gram staining procedures.	30 Hours	CO2
3	Identification and Diagnostic Techniques: Biochemical tests (catalase, oxidase, coagulase, IMViC), colony characteristics, hemolysis patterns. Rapid diagnostic kits. Collection, transport, and processing of clinical samples.	30 Hours	CO3
4	Sterilization, Antimicrobial Testing, and Infection Control Sterilization and disinfection techniques, Biosafety and laboratory safety practices, Antibiotic susceptibility testing (Kirby-Bauer), resistance mechanisms, Role of microbiology in infection prevention and control of HAIs	30 Hours	CO4

Suggested Readings

1. Ananthanarayan and Paniker's Textbook of Microbiology – 10th Edition
2. Textbook of Microbiology by C.P. Baveja – Latest Edition
3. Medical Microbiology by Jawetz, Melnick, and Adelberg – 27th Edition
4. Practical Microbiology by D.R. Arora – Lab manual references for diagnostic procedures

Course Articulation Matrix														
PO-PSO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	3	1	2	1	–	–	–	–	1	2	1	1	3	2
CO2	3	–	3	1	–	2	2	–	2	2	1	2	3	3
CO3	3	–	3	2	–	2	2	–	2	2	1	2	3	3
CO4	3	1	3	3	2	3	3	–	2	2	2	2	3	3

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