



Re-Accredited 'B++' 2.88 CGPA by NAAC

VEER NARMAD SOUTH GUJARAT UNIVERSITY

University Campus, Udhna-Magdalla Road, SURAT - 395 007, Gujarat, India.

વીર નર્મદ દક્ષિણ ગુજરાત યુનિવર્સિટી

યુનિવર્સિટી કેમ્પસ, ઉધના-મગદલા રોડ, સુરત - ૩૯૫ ૦૦૭, ગુજરાત, ભારત.

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-:પરિપત્ર:-

યુનિવર્સિટીના વિજ્ઞાન વિદ્યાશાખા હેઠળના તમામ શૈક્ષણિક વિભાગોના વડાશ્રીઓ અને યુનિવર્સિટી સંલગ્ન વિજ્ઞાન વિદ્યાશાખા હેઠળની તમામ કોલેજોનાં આચાર્યશ્રીઓને જણાવવાનું કે, NEP-2020 અંતર્ગત શૈક્ષણિક વર્ષ ૨૦૨૬-૨૭ થી અમલમાં આવનાર PGDMLT Sem.-1 & 2 નો પેટાસમિતિ દ્વારા તૈયાર કરવામાં આવેલ અભ્યાસક્રમ મેડિકલ ટેકનોલોજી વિષયની અભ્યાસ સમિતિના ચેરમેનશ્રીએ અભ્યાસ સમિતિવતી અને વિજ્ઞાન વિદ્યાશાખા ના અધ્યક્ષશ્રીએ વિદ્યાશાખાવતી મંજૂર કરી એકેડેમિક કાઉન્સિલને કરેલ ભલામણ એકેડેમિક કાઉન્સિલ ની તા.૨૪/૧૨/૨૦૨૪ની સભાનાં ઠરાવ ક્રમાંક:૩૫૩ અન્વયે માન.કુલપતિશ્રીને આપેલ સત્તા અંતર્ગત માનનીય કુલપતિશ્રી દ્વારા મંજૂર કરેલ છે, જેનો અમલ કરવા આથી જાણ કરવામાં આવે છે.

(બિડાણ: ઉપર મુજબ)

ક્રમાંક:ઓથો./પરિપત્ર/૧૭૬૮૮/૨૦૨૬

તા.૦૩/૦૮/૨૦૨૬


કુલસચિવ

પ્રતિ,

(૧) યુનિવર્સિટીના વિજ્ઞાન વિદ્યાશાખા હેઠળના તમામ શૈક્ષણિક વિભાગોના વડાશ્રીઓ.

(૨) યુનિવર્સિટી સંલગ્ન વિજ્ઞાન વિદ્યાશાખા હેઠળની તમામ કોલેજોનાં આચાર્યશ્રીઓ.

... આપશ્રીના વિભાગ/કોલેજના સંબંધિત શિક્ષકો/વિદ્યાર્થીઓને જાણ કરી અમલ કરવા સારું.

(૩) અધ્યક્ષશ્રી, વિજ્ઞાન વિદ્યાશાખા.

(૪) પરીક્ષા નિયામકશ્રી, પરીક્ષા વિભાગ, વીર નર્મદ દ. ગુ. યુનિવર્સિટી, સુરત.

.....તરફ જાણ તેમજ અમલ સારું.



Veer Narmad South Gujarat University, Surat

Syllabus of

**POST GRADUATE DIPLOMA IN
MEDICAL LABORATORY TECHNOLOGY**

Asper NEP- 2020 [1 Year PG Diploma Course]

Effective from 2026-2027

VEER NARMAD SOUTH GUJARAT UNIVERSITY, SURAT
POST GRADUATE DIPLOMA IN MEDICAL LABORATORY TECHNOLOGY

Name of Program	PGDMLT
Program Abbreviation	Post Graduate Diploma in Medical Laboratory Technology
Duration	1 Year (2 Semesters)
Eligibility Criteria	Candidate should have any of the following (A) or (B) degree (A) Bachelor's degree in science (B) Degree in M.B.B.S., BDS, BAMS, BHMS, B.Sc. Nursing, B. Pharmacy, B.Sc. Optometry, B. Physiotherapy
Pre-requisite	Nil
Medium of Instruction	English
Objective of Program	• To impart knowledge of the fundamental principles of medical laboratory science including biochemistry, microbiology, pathology, hematology, histopathology, blood banking etc. • To train students in the proper collection, handling and analysis of biological samples such as blood, urine, stool, body fluids and tissues. • To enable interpretation of laboratory tests • To develop technical competence in operating and maintaining modern laboratory instruments and auto-analyser. • To inculcate quality assurance and safety practice in laboratory operations. • To promote research aptitude and problem-solving skills. • To prepare graduates for employment in hospitals, diagnostic centers, research institutes and public health care laboratories
Program Outcome (PO)	PO-01: <u>Advanced Knowledge & Conceptual Understanding:</u> Demonstrate in-depth knowledge of core principles and emerging trends in the chosen scientific discipline. Integrate multidisciplinary scientific concepts to address real-world challenges in research and industry. PO-02: <u>Research & Analytical Skills:</u> Develop critical thinking, problem-solving and research-oriented skills for innovation and scientific advancements. Apply modern experimental, computational and statistical tools for data analysis and evidence-based conclusions. PO-03: <u>Technological Proficiency & Instrumentation:</u> Gain expertise in advanced laboratory techniques, computational modelling and high-end scientific instrumentation. Utilize cutting-edge technologies such as artificial intelligence, bioinformatics and nanotechnology for scientific exploration.

	<u>PO-04:Environmental & Societal Impact:</u> Understand the role of science in addressing environmental sustainability, public health and resource management. Contribute to biodiversity conservation, sustainable agriculture and climate change mitigation through scientific solutions. <u>PO-05:Innovation & Entrepreneurship:</u> Apply scientific knowledge for the development of innovative products, processes and services in industry & start-ups. Promote entrepreneurship in science and technology, healthcare, analytics and environmental sciences through technology transfer. <u>PO-06: Communication & Collaborative Research:</u> Develop proficiency in scientific communication, technical writing and effective dissemination of research findings. Engage in interdisciplinary collaborations, industry-academic partnerships and global research networks. <u>PO-07:Ethical & Value-Based Scientific Practices:</u> Uphold scientific integrity, ethical research practices and social responsibility in professional and academic endeavours. Apply knowledge with a strong ethical framework, considering societal, legal and environmental implications. <u>PO-08:Lifelong Learning & Career Readiness:</u> Cultivate a mind-set for lifelong learning, professional growth and adaptability to new scientific developments. Prepare for higher education, research careers, competitive exams and industry-oriented roles in science and technology.
Program Specific Outcomes (PSO)	The Post Graduate Diploma in Medical Laboratory Technology (PGMLT) program is designed to equip students with the knowledge, skills, and practical expertise to work in various healthcare and diagnostic laboratory settings. The program focuses on medical laboratory sciences, providing comprehensive training in different laboratory departments, and prepares students to handle diagnostic procedures, laboratory equipment, and patient sample analysis. Upon successful completion of the PGDMLT programme, students will be able to: <u>PSO 1: Analytical and technical knowledge & expertise for patient care</u> Demonstrate proficiency in performing laboratory tests in disciplines such as haematology, clinical biochemistry, microbiology, immunology, pathology, parasitology, blood banking and molecular diagnostics to support accurate diagnosis and treatment of diseases. Utilize advanced analytical skills to interpret laboratory findings accurately and correlate results with clinical conditions to improve patient care. <u>PSO 2: Quality work and safe laboratory environment</u> Students will understand laboratory safety protocols and the importance of maintaining high standards of accuracy and precision in diagnostic testing and also able to manage information to enable effective, timely, accurate,

	and cost- effective reporting of laboratory-generated information and make specimen-oriented decisions on predetermined criteria, including working knowledge of critical values. PSO 3: <u>Ethical and Professional Conduct</u> Adhere to professional ethics, confidentiality, and legal standards while performing laboratory procedures and handling patient information. PSO 4: <u>Communication and Teamwork</u> Exhibit effective communication skills to collaborate with healthcare professionals, ensuring timely and accurate delivery of laboratory results for clinical decision-making. PSO 5: <u>Perpetual Learning and skill enhancement</u> Commit to lifelong learning by updating knowledge in emerging trends, technologies, and advancements in medical laboratory sciences for continuous professional development. PSO 6: <u>Professional Competence</u> Students will be well-prepared to execute their work in clinical laboratories, hospital laboratories, public health organizations, research institutions, and medical device companies, and contribute to advancements in medical diagnostics and patient care. PSO 7: <u>Laboratory management and Quality Control</u> Apply knowledge of laboratory management principles, including quality control, equipment maintenance and inventory control to ensure efficient and effective laboratory operations. Process information and ensure quality control as appropriate to routine laboratory procedures. PSO 8: <u>Entrepreneur skill</u> The students can empower their skill and scientific knowledge involving healthcare-minded individuals creating new businesses, services or solutions to address unmet needs or improve healthcare delivery, often through innovation and a focus on patients-centric care. Proficiently perform a full range of clinical laboratory tests, develop and evaluate test systems and interpretive algorithms and should be able to work on automated machines.																																																																																	
Mapping between Pos and PSOs	<table><tr><td></td><td>PSO1</td><td>PSO2</td><td>PSO3</td><td>PSO4</td><td>PSO5</td><td>PSO6</td><td>PSO7</td><td>PSO8</td></tr><tr><td>PO1</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>PO2</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>PO3</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>PO4</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>PO5</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>PO6</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>PO7</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>PO8</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr></table>		PSO1	PSO2	PSO3	PSO4	PSO5	PSO6	PSO7	PSO8	PO1									PO2									PO3									PO4									PO5									PO6									PO7									PO8								
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VEER NARMAD SOUTH GUJARAT UNIVERSITY, SURAT

STRUCTURE OF PROGRAM – POST GRADUATE DIPLOMA IN MEDICAL LABORATORY TECHNOLOGY (PGDMLT) – SEMESTER – 1

Course Category	Course Code	Course Title	Marksheet Title in English	Level of Course	Teaching Hours/Week		Exam Duration		Credit		Internal Marks		External Marks		Total Marks	
					TH	PR	TH	PR	TH	PR	TH	PR	TH	PR	TH	PR
MAJOR	PGDMLT - 1001	Immunology	Immunology	400-499	02	04	01.00 h	06.00 h	02	02	25	25	25	25	50	50
MAJOR	PGDMLT - 1002	Fundamentals of microbiology	Fundamentals of microbiology	400-499	02	04	01.00 h	06.00 h	02	02	25	25	25	25	50	50
MAJOR	PGDMLT - 1003	Medical Microbiology	Medical Microbiology	400-499	02	04	01.00 h	06.00 h	02	02	25	25	25	25	50	50
MAJOR	PGDMLT - 1004	Fundamentals of MLT	Fundamentals of MLT	400-499	04	00	02.00 h	00 h	04	00	50	00	50	00	100	00
MAJOR	PGDMLT - 1005	Instrumentation and Techniques	Instrumentation and Techniques	400-499	04	00	02.00 h	00 h	04	00	50	00	50	00	100	00
BKS	PGDMLT - 1006	Bhartiya Ghayan Parampara of Health and Diagnosis	Bhartiya Ghayan Parampara of Health and Diagnosis	400-499	02	00	01.00 h	00 h	02	00	25	00	25	00	50	00
Total	Paper- o6				16	12			16+6=22		200	125	200	125	400	150

STRUCTURE OF PROGRAM – POST GRADUATE DIPLOMA IN MEDICAL LABORATORY TECHNOLOGY (PGDMLT) – SEMESTER – 2

Course Category	Course Code	Course Title	Marksheet Title in English	Level of Course	Teaching Hours/Week		Exam Duration		Credit		Internal Marks		External Marks		Total Marks	
					TH	PR	TH	PR	TH	PR	TH	PR	TH	PR	TH	PR
MAJOR	PGDMLT - 2001	Haematology	Haematology	400-499	02	04	01.00 h	06.00 h	02	02	25	25	25	25	50	50
MAJOR	PGDMLT - 2002	Clinical Pathology	Clinical Pathology	400-499	02	04	01.00 h	06.00 h	02	02	25	25	25	25	50	50
MAJOR	PGDMLT - 2003	Clinical Biochemistry	Clinical Biochemistry	400-499	02	04	01.00 h	06.00 h	02	02	25	25	25	25	50	50
MAJOR	PGDMLT - 2004	Immunohaematology	Immunohaematology	400-499	02	04	01.00 h	06.00 h	02	02	25	25	25	25	50	50
MAJOR	PGDMLT - 2005	Training in Clinical Laboratory	Training in Clinical Laboratory	400-499	Total 180 hr.		06-08 h		00	04	00	50	00	50	00	100
SEC	PGDMLT - 2006	Histo-cytological Techniques	Histo-cytological Techniques	400-499	02	00	01.00 h	06.00 h	02	00	25	00	25	00	50	00
Total					10	16 h in institute Lab and Total 180 h in Clinical Lab			10+12= 22		125	150	125	150	250	300

PGDMLT-1001: IMMUNOLOGY

Program Name	Post Graduate Diploma in Medical Laboratory Technology																
Semester	I																
NCrF Credit Level	6																
Course Type	Major																
Course Subtype	Employability																
Subject Type	Discipline Specific																
Course Code	PGDMLT- 1001																
Course Level	400-499																
Course Title	Immunology																
Credit	Theory:	2	Practical:	2	Total:	4											
Effective From	Academic Year: 2026-2027																
Course Outcome	• CO-1: The students will gain basic concepts of immunity, including its types (innate and acquired) and their roles in protecting the body. • CO-2: To understand the structure and functions of organs and cells of the immune system and explain their coordinated response. • CO-3: To understand the principles of vaccination, types of vaccines, and the national immunization schedule followed in India ethically and decision making. • CO-4: The students will learn the properties, types, and characteristics of antigens and antibodies, including their structure for proper delivery of results and decision making. • CO-5: The students will gain the knowledge of different mechanisms and factors affecting antigen–antibody reactions in immunological responses. • CO-6: The students will learn common immunological techniques such as: Precipitation and agglutination reactions, Immunochromatography, ELISA, RIA, Immunofluorescence in medical diagnostics and health care.																
Mapping between Cos and PSOs		PSO1	PSO2	PSO3	PSO4	PSO5	PSO6	PSO7	PSO8								
	CO1																
	CO2																
	CO3																
	CO4																
	CO5																
	CO6																
Course Content	<table><tr><th>Unit No.</th><th>Content</th><th>Teaching Hours</th></tr><tr><td>Unit-1</td><td>Immunity</td><td rowspan="3">15 Hr.</td></tr><tr><td>1.1</td><td>Introduction</td></tr><tr><td>1.2</td><td>Classification of Immunity: Innate, Acquired, Active,</td></tr></table>							Unit No.	Content	Teaching Hours	Unit-1	Immunity	15 Hr.	1.1	Introduction	1.2	Classification of Immunity: Innate, Acquired, Active,
Unit No.	Content	Teaching Hours															
Unit-1	Immunity	15 Hr.															
1.1	Introduction																
1.2	Classification of Immunity: Innate, Acquired, Active,																

		Passive, Cell Mediated and Humoral		
	1.3	Organs and Cells of Immune System		
	1.4	Vaccine: Types and Vaccination Schedule in India		
	Unit-2	Antigen, Antibody and Antigen – Antibody Reactions	15 Hr.	
	2.1	Antigen: Definition, Characteristics, Properties, Classification and Types		
	2.2	Antibody: Definition, Characteristics, Properties, Structure and Types		
	2.3	Factors Affecting Antigen – Antibody reactions Antigen – Antibody Reactions: Precipitation Reaction Agglutination Reaction Immunochromatographic Technique ELISA RIA Immunofluorescence		
PGDMLTP- 1001: PRACTICALS BASED ON IMMUNOLOGY				
Course content:				
1) ICT/Dot immunoassay/ Flow through assay for HIV Ab				
2) ICT/Dot immunoassay/ Flow through assay for HBsAg				
3) ICT/Dot immunoassay/ Flow through assay for HCV Ab				
4) Slide / Tube/ Strip / Cassette/ Dot immunoassay test for typhoid				
5) Slide test/ Flow through /Spot/ Dot immunoassay for Syphilis				
6) Latex test for Rheumatoid arthritis				
7) Latex test for C-Reactive protein				
8) Latex test for Anti Streptolysin O (ASO)				
9) ELISA for detection of HIV Ab (Demonstration)				
10) ELISA for detection of HBsAg (Demonstration)				
Reference Books	Sr. No.	Title/Edition	Authors	Publisher
	1	A Text Book of Immunology For MLT	Dr. Mita Vakilwala Dr. Ankita Leanwala	New Popular Prakashan
	2	Immunology/7 th ed.	Owen, Judith A., Punt Stanford, Sharon A., Jones, Patricia P., Kuby	Macmillan Higher education Pub.
	3	Immunology	B. S. Nagoba, D. V. Vedpathak	BI Publication Pvt LTD
	4	Text book of Medical Microbiology/5 th	R. Anantnarayan C. K. Jayram Paniker	Orient Longman, Madras.
	5	Immunology/2 nd	P. Lydyard A. Whelan M. W. Fanger	BIOS Scientific Publishers Limited

	6	Essential Immunology/6 th	I.M. Roitt	ELBS, London
	7	A Handbook of Practical Immunology/1 st	G.P. Talwar	Vikas Publishing House.
	8	Medical Laboratory Technology/ 4 th	Sood R.	Jaypee Brothers.
	9	Textbook of Medical Laboratory Technology	P. B. Godkar, D. P. Godkar	Bhalani Pub.
	10	Practical Manual for Medical Laboratory Technology- Volume 1	Mayuri Dholaria, Jigna Naik, Urvashi Desai & Rinku Shukla	New Popular Prakashan
Teaching Methodology	Theory: Lecture Based Learning, Discussion, Self-study, Seminar, Assignments, Technology Enhanced Teaching using Digital Tools Practical: Laboratory work, Direct Instruction with Demonstration, Journal Preparation, Experiments			
Evaluation Method	Theory: Internal Assessment: 25 Marks: Internal test, Attendance, Class Assignments/ Seminar, Home Assignment External Assessment: 25 Marks: Semester end University examination Practical: Internal Assessment: 25 Marks: Attendance, Viva/ Internal practical examination, Lab Work External Assessment: 25 Marks: Semester end University examination			

PGDMLT-1002: FUNDAMENTALS OF MICROBIOLOGY

Program Name	Post Graduate Diploma in Medical Laboratory Technology								
Semester	I								
NCrF Credit Level	6								
Course Type	Major								
Course Subtype	Employability								
Subject Type	Discipline Specific								
Course Code	PGDMLT- 1002								
Course Level	400-499								
Course Title	Fundamentals of Microbiology								
Credit	Theory:	2	Practical:	2	Total:	4			
Effective From	Academic Year: 2026-2027								
Course Outcome	• CO-1: The students will gain knowledge to analyse the historical milestones in microbiology by evaluating the contributions of scientist and Germ Theory of Disease. • CO-2: The students will gain knowledge to differentiate between various microorganisms: Bacteria, Viruses, Fungi and Parasites; based on their structural morphology, classification, and biological characteristics. Apply the principles of optics and microscopy to examine specimens effectively; • CO-3: The students will learn how to examine the ecological significance of the normal flora of the human body. • CO-4: The students will be able to integrate chemical preparation methods, including the use of stains, fixatives, and mordents, to enhance the contrast and identification of biological specimens. • CO-5: The students will be able to execute aseptic techniques and sterilization protocols by selecting appropriate physical or chemical methods for laboratory safety and contamination control. • CO-6: The students will be able to implement methods for the cultivation and isolation of pure culture using various media types.								
Mapping between Cos and PSOs		PSO1	PSO2	PSO3	PSO4	PSO5	PSO6	PSO7	PSO8
	CO1								
	CO2								
	CO3								
	CO4								
	CO5								
	CO6								
Course Content	Unit No.	Content							Teaching Hours
	Unit-1	Introduction to Microbial World							15 Hr.
	1.1	Contributions of Louis Pasteur and Robert Koch							
	1.2	Bacteria: Cell Structure and Morphological Classification							
	1.3	Virus: General Structure, Morphology and Characteristics							
	1.4	Fungi: General Properties and Classification							

	1.5	Parasite: Types and Host Parasite Relationship	15 Hr.	
	1.6	Normal Flora of Human Body		
	Unit-2	General Microbiology		
	2.1	Basic of Microscopy: Refraction and refractive Index, Magnification, Numerical aperture, Resolution and Resolving Power and Types		
	2.2	Importance and applications of dyes, stains, fixatives, mordent and intensifiers.		
	2.3	Sterilization and Disinfection Sterilization: Definition, Principles, Application and Methods Disinfection: Ideal characteristics and Mode of action		
	2.4	Methods of Cultivation: a) Broth, slant and Stab b) Enrichment technique		
	2.5	Methods of Isolation		
PGDMLTP- 1002: PRACTICALS BASED ON FUNDAMENTALS OF MICROBIOLOGY Course content: 1) Examination of living Bacteria a. Wet mount preparation b. Hanging – drop technique c. Semisolid stab agar test 2) Observation of Bacteria by staining techniques: a) Simple Staining b) Negative Staining. 3) Differential Staining Techniques: a) Gram Staining b) Acid fast Staining. 4) Special Staining Techniques: a) Spirochaete Staining b) Metachromatic Granules Staining. c) Spore Staining d) Capsule Staining 5) Study of Cultural and Growth Characteristics on Bacteriological Media: Nutrient Agar, Mac Conkey Agar, Eosin Methylene Agar, W.B. Agar, Blood Agar, Chocolate Agar, MSA 6) Study of some important biochemical reactions: a) Indole Test, Methyl red Test, V.P. Test, Citrate Utilization Test, H₂S Production (2% peptone), TSI slants, Sugars Fermentation Test b) Test for enzyme activity-Oxidase, Catalase, Coagulase, Urease 7) Bactericidal effect of Antiseptic and Disinfectant on microbial growth				
Reference Books	Sr. No.	Title/ Edition	Authors	Publisher
	1	A Textbook of Basics of Microbiology for MLT	Dr. Urvashi Desai Ms. Twinkle Patel	New Popular Prakashan
	2	Textbook of Microbiology for MLT	Dr. C P Baveja, Dr. V. Baveja	Arya Publications
	3	Elementary Microbiology, Fundamentals of Microbiology, Vol-1	Modi H.A.	Ekta Prakashan
	4	Microbiology/8 th	Prescott M, Harley John P.	Mc Graw Hill
	5	A text book of Microbiology and immunology/2 nd	Subhash Chandra Parija	ELSEVIER
	6	Mackie and McCartney Medical Microbiology. A Guide to Laboratory	J. P. Duguid	Churchill Livingstone

		Diagnosis and control of Infection/13 th		
	7	Textbook of Medical Laboratory Technology /3 rd	Praful B Godkar	Bhalani Publisher
	8	Experimental Microbiology, Volume 1 & 2	Patel R. J., and Patel K. R	Aditya Pub
	9	Practical Manual for Medical Laboratory Technology- Volume 1	Mayuri Dholaria, Jigna Naik, Urvashi Desai & Rinku Shukla	New Popular Prakashan
Teaching Methodology	Theory: Lecture Based Learning, Discussion, Self-study, Seminar, Assignments, Technology Enhanced Teaching using Digital Tools Practical: Laboratory work, Direct Instruction with Demonstration, Journal Preparation, Experiments			
Evaluation Method	Theory: Internal Assessment: 25 Marks: Internal test, Attendance, Class Assignments/ Seminar, Home Assignment External Assessment: 25 Marks: Semester end University examination Practical: Internal Assessment: 25 Marks: Attendance, Viva/ Internal practical examination, Lab Work External Assessment: 25 Marks: Semester end University examination			

PGDMLT-1003: MEDICAL MICROBIOLOGY

Program Name	Post Graduate Diploma in Medical Laboratory Technology																			
Semester	I																			
NCrF Credit Level	6																			
Course Type	Major																			
Course Subtype	Employability																			
Subject Type	Discipline Specific																			
Course Code	PGDMLT- 1003																			
Course Level	400-499																			
Course Title	Medical Microbiology																			
Credit	Theory:	2	Practical:	2	Total:	4														
Effective From	Academic Year :2026-2027																			
Course Outcome	• CO-1: The students will obtain the skills for infectious diseases diagnosis. • CO-2: The students will be able to identify and differentiate between common pathogenic bacteria based on their identifying characteristics. • CO-3: The students will learn types of mycotic infections and laboratory diagnostic procedures. • CO-4: The students will be able to learn the causative agents and diagnostic framework for viral diseases. • CO-5: The students will learn to illustrate the morphology and life cycles of parasites to facilitate identification of parasites in clinical specimens. • CO-6: The students will be able to integrate general principles of laboratory diagnosis to develop systemic workflows for investigating infections in a clinical microbiology setup.																			
Mapping between Cos and PSOs		PSO1	PSO2	PSO3	PSO4	PSO5	PSO6	PSO7	PSO8											
	CO1																			
	CO2																			
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	CO4																			
	CO5																			
	CO6																			
Course Content	<table><tr><th>Unit No.</th><th>Content</th><th>Teaching Hours</th></tr><tr><td>Unit-1</td><td>Diagnostic Bacteriology and Mycology</td><td rowspan="3">15 Hr.</td></tr><tr><td>1.1</td><td>Causative agent and Laboratory diagnosis of Bacterial Diseases: Cholera, Syphilis, Typhoid, Tuberculosis, Food Poisoning, Urinary Tract Infection</td></tr><tr><td>1.2</td><td>Identifying Characteristics of Common Pathogenic Bacteria: <i>Staphylococcus aureus</i>, <i>Streptococcus</i></td></tr></table>										Unit No.	Content	Teaching Hours	Unit-1	Diagnostic Bacteriology and Mycology	15 Hr.	1.1	Causative agent and Laboratory diagnosis of Bacterial Diseases: Cholera, Syphilis, Typhoid, Tuberculosis, Food Poisoning, Urinary Tract Infection	1.2	Identifying Characteristics of Common Pathogenic Bacteria: <i>Staphylococcus aureus</i> , <i>Streptococcus</i>
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1.2	Identifying Characteristics of Common Pathogenic Bacteria: <i>Staphylococcus aureus</i> , <i>Streptococcus</i>																			

	<i>pneumoniae, Bacillus cereus, Escherichia coli, Klebsiella spp., Proteus vulgaris, Salmonella spp., Pseudomonas aeruginosa</i>																													
1.3	Mycosis: Cutaneous, Sub Cutaneous and Systemic Mycosis																													
1.4	Laboratory Diagnosis of Mycotic Infections																													
Unit-2	Diagnostic Virology and Parasitology	15 Hr.																												
2.1	Causative agent and Laboratory diagnosis of Viral Diseases: AIDS, Hepatitis, Dengue, Chikungunya, SARS																													
2.2	General Laboratory Diagnosis of Viral Infection																													
2.3	Morphology, Life Cycle and Laboratory diagnosis of Malaria and Amoebic Dysentery																													
2.4	General Laboratory Diagnosis for Parasitic Infection																													
PGDMLTP- 1003: PRACTICALS BASED ON MEDICAL MICROBIOLOGY Course content: 1) Collection, Transportation and Examination of Clinical specimen: Urine, Sputum, Pus, Faeces, Blood, CSF Processing of Blood sample for bacterial culture 2) Processing of Urine sample for bacterial culture 3) Processing of Stool sample for bacterial culture 4) Processing of CSF sample for bacterial culture 5) Processing of Sputum sample for bacterial culture 6) Processing of Pus sample for bacterial culture 7) Antimicrobial Susceptibility Test 8) Examination of Fungi from clinical specimen by direct microscopic method 9) Detection of malarial parasites by immunochromatographic test/Blood smear 10) Study of parasites present in: • Stool: <i>Giardia lamblia, Entamoeba histolytica, Taenia species & Ascaris lumbricoides</i> • Blood: <i>Plasmodium spp., Microfilaria & Leishmania donovani</i>																														
Reference Books	<table><tr><th>Sr. No.</th><th>Title/ Edition</th><th>Authors</th><th>Publiser</th></tr><tr><td>1</td><td>A Textbook of Medical Microbiology for MLT</td><td>Dr. Rinku Shukla Dr. Jignisha Patel</td><td>New Popular Prakashan</td></tr><tr><td>2</td><td>Textbook of Medical Laboratory Technology /3rd</td><td>Praful B Godkar</td><td>Bhalani Publisher</td></tr><tr><td>3</td><td>Textbook of Medical Laboratory Technology/3rd</td><td>Ramnik Sood</td><td>Jaypee</td></tr><tr><td>4</td><td>Clinical Microbiology & Parasitology (For DMLT students)/3rd edition</td><td>Nanda Maheshwari</td><td>Jaypee</td></tr><tr><td>5</td><td>Instant Notes in Microbiology/3rd edition</td><td>Simon Baker</td><td>Taylor & Francis</td></tr><tr><td>6</td><td>Medical Microbiology/16th</td><td>David Greenwood</td><td>Elsevier</td></tr></table>	Sr. No.	Title/ Edition	Authors	Publiser	1	A Textbook of Medical Microbiology for MLT	Dr. Rinku Shukla Dr. Jignisha Patel	New Popular Prakashan	2	Textbook of Medical Laboratory Technology /3 rd	Praful B Godkar	Bhalani Publisher	3	Textbook of Medical Laboratory Technology/3 rd	Ramnik Sood	Jaypee	4	Clinical Microbiology & Parasitology (For DMLT students)/3 rd edition	Nanda Maheshwari	Jaypee	5	Instant Notes in Microbiology/3 rd edition	Simon Baker	Taylor & Francis	6	Medical Microbiology/16 th	David Greenwood	Elsevier	
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	7	Medical Parasitology/5 th	D R Arora	CBS publishers
	8	Textbook of Medical Parasitology/8 th	Sougata Ghosh	Jaypee
	9	Clinical Microbiology/ 2 nd	B.S. Nagoba	BI Publications
	10	Short Text Book of Medical Microbiology-including Parasitology/ 10 th	Satish Gupte	Jaypee
	11	Practical Manual for Medical Laboratory Technology- Volume 1	Mayuri Dholaria, Jigna Naik, Urvashi Desai & Rinku Shukla	New Popular Prakashan
Teaching Methodology	Theory: Lecture Based Learning, Discussion, Self-study, Seminar, Assignments, Technology Enhanced Teaching using Digital Tools Practical: Laboratory work, Direct Instruction with Demonstration, Journal Preparation, Experiments			
Evaluation Method	Theory: Internal Assessment: 25 Marks: Internal test, Attendance, Class Assignments/ Seminar, Home Assignment External Assessment: 25 Marks: Semester end University examination Practical: Internal Assessment: 25 Marks: Attendance, Viva/ Internal practical examination, Lab Work External Assessment: 25 Marks: Semester end University examination			

PGDMLT-1004: FUNDAMENTALS OF MLT

Program Name	Post Graduate Diploma in Medical Laboratory Technology																																																			
Semester	I																																																			
NCrF Credit Level	6																																																			
Course Type	Major																																																			
Course Subtype	Employability																																																			
Subject Type	Discipline Specific																																																			
Course Code	PGDMLT- 1004																																																			
Course Level	400-499																																																			
Course Title	Fundamentals of MLT																																																			
Credit	Theory:	04	Practical:	00	Total:	04																																														
Effective From	Academic Year: 2026-2027																																																			
Course Outcome	• CO-1: The students will get knowledge of Basics of clinical laboratory and its types, Ethics and Law of clinical laboratory, organization and Accreditation of Laboratory. • CO-2: The students will understand the Laboratory safety and waste management process. • CO-3: The students will learn how to prepare different types of solutions, its preparation and laboratory calculation. • CO-4: The students will gain knowledge of various Quality Laboratory process, Quality control and QC chart preparation as well as Westgard multi-rule chart for QC.																																																			
Course Content	<table><tr><td></td><td>PSO1</td><td>PSO2</td><td>PSO3</td><td>PSO4</td><td>PSO5</td><td>PSO6</td><td>PSO7</td><td>PSO8</td></tr><tr><td>CO1</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>CO2</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>CO3</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>CO4</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr></table>								PSO1	PSO2	PSO3	PSO4	PSO5	PSO6	PSO7	PSO8	CO1									CO2									CO3									CO4								
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Teaching Methodology	Theory: Lecture Based Learning, Discussion, Self-study, Seminar, Assignments, Technology Enhanced Teaching using Digital Tools
Evaluation Method	Theory: Internal Assessment: 50 Marks: Internal test, Attendance, Class Assignments/ Seminar, Home Assignment External Assessment: 50 Marks: Semester end University examination

PGDMLT-1005: INSTRUMENTATION AND TECHNIQUES

Program Name	Post Graduate Diploma in Medical Laboratory Technology								
Semester	I								
NCrF Credit Level	6								
Course Type	Major								
Course Subtype	Employability								
Subject Type	Discipline Specific								
Course Code	PGDMLT- 1005								
Course Level	400-499								
Course Title	Instrumentation and Techniques								
Credit	Theory:	4	Practical:	0	Total:	4			
Effective From	Academic Year: 2026-2027								
Course Outcome	• CO-1: The students will gain knowledge of various laboratory instruments commonly used in pathological laboratories. • CO-2: The students will understand the diagnostic techniques used in modern laboratories. • CO-3:The students will learn the basic principles, components, laboratory use and how to maintain the instrument. • CO-4:The students will be able to understand the operation, monitoring, measurement and laboratory analysis. • CO-5: The students will learn the techniques used in clinical and research laboratory.								
Mapping between Cos and PSOs		PSO1	PSO2	PSO3	PSO4	PSO5	PSO6	PSO7	PSO8
	CO-1								
	CO-2								
	CO-3								
	CO-4								
	CO-5								
Course Content	Unit No.	Content							Teaching Hours
	Unit-1	Laboratory Instruments							15 Hr.
	1.1	pH Meter							
	1.2	Centrifuge							
	1.3	Colorimeter							
	1.4	Spectrophotometer							
	Unit-2	Electrophoresis							15 Hr.
	2.1	Principle and Components							
	2.2	Factors Affecting Electrophoretic mobility							
	2.3	Support Media: Agarose Gel and Poly Acrylamide Gel							
2.4	Types of Electrophoresis: Agarose Gel Electrophoresis								

		SDS and Native PAGE Gradient Gel Electrophoresis Iso Electric Focusing 2D Gel Electrophoresis		
	Unit-3	Chromatography	15 Hr.	
	3.1	Introduction, Principle and Application		
	3.2	Paper Chromatography and Thin Layer Chromatography		
	3.3	Ion Exchange Chromatography		
	3.4	GLC and HPLC		
	Unit-4	Advance Diagnostic Techniques	15 Hr.	
	4.1	Blotting Techniques		
	4.2	NAAT – PCR		
	4.3	Haematology Cell Counter		
	4.4	Fully and Semi Auto Biochemistry Analyser		
Reference Books	Sr. No.	Title/Edition	Authors	Publisher
	1	Analytical Biochemistry: (Biochemical Technique)	P. Ashokan	Chinna Pub., Nelvisharani, Vellor
	2	Textbook of Medical Laboratory Technology/3 rd	P.B. Godkar	Bhalani Publishing
	3	A Text Book of Instrumentation and Techniques for MLT	Dr. J Naik, Dr. M. Dholaria, Dr. R. Shukla, Ms. T. Patel, Ms. H. Patel	New Popular Prakashan
	4	Medical Laboratory Science: Theory & Practice	Ochei J. & Kolhatkar A	Tata McGraw Hill Pub.
	5	Practical Biochemistry: Principles & Technique/5 th	Wilson K. & Walker J	Cambridge University Press
	Teaching Methodology	Theory: Lecture Based Learning, Discussion, Self-study, Seminar, Assignments, Technology Enhanced Teaching using Digital Tools		
Evaluation Method	Theory: Internal Assessment: 50 Marks: Internal test, Attendance, Class Assignments/ Seminar, Home Assignment External Assessment: 50 Marks: Semester end University examination			

PGDMLT – 1006: BHARTIYA GHAYAN PARAMPARA OF HEALTH AND DIAGNOSIS

Program Name	PGDMLT								
Semester	I								
NCrF Credit Level	6								
Course Type	BKS								
Course Subtype	Nil								
Subject Type	Discipline Specific								
Course Code	PGDMLT – 1006								
Course Level	400-499								
Course Title	Bhartiya Ghayan Parampara of Health and Diagnosis								
Credit	Theory:	02	Practical:	00	Total:	02			
Effective From	Academic Year: 2026-2027								
Course Outcome	At the end of the course • CO1: The students will learn the concepts of Vedic tradition and diseases involved with vat, pitta and cough. • CO2: The students will understand the disease Pandu roga which basically involves pitta dosha in blood. • CO3: Gain insights about the causes, symptoms and doshas of Rakta pitta and Raktarbuda. • CO4: The students will learn the diagnostic methods for identifying impure blood through Ayurveda and Modern science. • CO5: The students will gain knowledge about the history of Indian laboratory medicine. Also recognize the contribution of Charaka who wrote charak samhita and will be aware of nidana sthana. They will be acquainted with the information of traditional practices ofurine analysis in Ayurveda & Tailabindu Pariksha. • CO6: They will be acquiring the knowledge of digestive strength, dosha imbalance, presence of toxins and overall gut health by understanding the analysis of stool i.e. Purisha Pariksha through Aryurveda.								
Course Content		PSO1	PSO2	PSO3	PSO4	PSO5	PSO6	PSO7	PSO8
	CO1								
	CO2								
	CO3								
	CO4								
	CO5								
	CO6								
Mapping between Cos and PSOs	Unit No.	Content							Teaching Hours
	Unit-1	Raktaj Vyadhi: Vedic Tradition							15
	1.1	Pandu Roga: Causes, symptoms, Types							

	<table><tr><td>1.2</td><td>Raktapitta: Causes, symptoms, Dosha association and Classification</td><td></td></tr><tr><td>1.3</td><td>Raktarbuda: Causes, Symptoms, Ayurvedic management</td><td></td></tr><tr><td>1.4</td><td>Diagnostic methods for identifying impure blood through Ayurveda and Modern science</td><td></td></tr><tr><td>Unit-2</td><td>IKS in Diagnosis</td><td>15</td></tr><tr><td>2.1</td><td>History of Laboratory Medicine</td><td></td></tr><tr><td>2.2</td><td>Nidana Sthana by Charak Samhita</td><td></td></tr><tr><td>2.3</td><td>Uroscopy in Ayurveda: Introduction, Urine analysis in Ayurveda & Tailabindu Pariksha</td><td></td></tr><tr><td>2.4</td><td>Purisha Pariksha in Ayurveda</td><td></td></tr></table>	1.2	Raktapitta: Causes, symptoms, Dosha association and Classification		1.3	Raktarbuda: Causes, Symptoms, Ayurvedic management		1.4	Diagnostic methods for identifying impure blood through Ayurveda and Modern science		Unit-2	IKS in Diagnosis	15	2.1	History of Laboratory Medicine		2.2	Nidana Sthana by Charak Samhita		2.3	Uroscopy in Ayurveda: Introduction, Urine analysis in Ayurveda & Tailabindu Pariksha		2.4	Purisha Pariksha in Ayurveda	
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Teaching Methodology	Theory: Lecture Based Learning, Discussion, Self-study, Seminar, Assignments, Technology Enhanced Teaching using Digital Tools																								
Evaluation Method	Theory: Internal Assessment: 25 Marks: Internal test, Attendance, Class Assignments/ Seminar, Home Assignment External Assessment: 25 Marks: Semester end University examination																								

SEMESTER - 2

PGDMLT-2001: HAEMATOLOGY

Program Name	Post Graduate Diploma in Medical Laboratory Technology																													
Semester	II																													
NCrF Credit Level	6																													
Course Type	Major																													
Course Subtype	Employability																													
Subject Type	Discipline Specific																													
Course Code	PGDMLT- 2001																													
Course Level	400-499																													
Course Title	Haematology																													
Credit	Theory:	2	Practical:	2	Total:	4																								
Effective From	Academic Year: 2026-2027																													
Course Outcome	• CO-1: The students will get knowledge of Blood and its functions • CO-2: They will learn about collection of blood in various anticoagulants. • CO-3: They will be able to understand Haemoglobin and its abnormal forms resulting in diseases. • CO-4: Detailed study of Red Cells, White cells, Platelets and their clinical significance • CO-5: They will learn about Haemoglobinopathies, anemia, Leukaemia and Coagulation and its disorders • CO-6: They will be able to perform all basic haematological tests in laboratory.																													
Mapping between Cos and PSOs		PSO1	PSO2	PSO3	PSO4	PSO5	PSO6	PSO7	PSO8																					
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	CO-2																													
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1.4	Haemoglobin: Structure, Types and its estimation																													
1.5	WBC: Leucopoiesis, Normal and Abnormal Morphology																													
1.6	Platelet: Thrombopoiesis																													
Unit-2	Hematological disorders	15 Hr.																												

	2.1	Haemoglobinopathies: Abnormal Haemoglobin, Sickle Cell Anaemia& Thalassemia		
	2.2	Anemia: Definition, Classification, Factors causing anemia, Clinical and laboratory features, Iron deficiency anaemia, Vitamin B ₁₂ deficiency anaemia, G ₆ PD deficiency anaemia		
	2.3	Introduction and general Classification of Leukaemias, Clinical and laboratory features		
	2.4	Haemostasias and Coagulation Cascade		
	2.5	Bleeding Disorders: Haemophilia, Von Willebrand Disease and Disseminated Intravascular Coagulation		
PGDMLTP-2001: PRACTICALS BASED ON HAEMATOLOGY				
Course content:				
1. Venous Blood Collection 2. Haemoglobin estimation: Sahli’s method and Cyanmethemoglobin method 3. Total R.B.C. Count 4. Total W.B.C. Count. 5. Platelet Count. 6. Differential Count. 7. Reticulocyte Count 8. Determination of E.S.R. (Westergren / Wintrobe method) 9. Determination of Haematocrit (Packed cell volume) 10. NESTROF test 11. Sickling test- Slide Test 12. G₆PD Deficiency Test 13. Tests for Coagulation Disorder: Bleeding time (BT), Clotting time (CT), Prothrombin time (PT), Activated Partial Thromboplastin Time (APTT), D-dimer (Demonstration)				
Reference Books	Sr. No.	Title/Edition	Authors	Publisher
	1	A Text Book of Haematology for MLT	Dr. Mita Vakilwala, Dr. Jignisha Patel	New Popular Prakashan
	2	Practical Haematology. The English Language Book Society/ 8 th	Dacei J.A & Lewis S.M.	Elseiver
	3	Clinical Haematology, Kothari’s Indian Edition.	Wintrobe M. M.	Wolters Kluwer
	4	Textbook of MLT/ 3 rd edition,	Godkar P. B.	Bhalani Publications.
	5	Clinical Pathology, Haematology and Blood Banking Microbiology (For DMLT students)/4 th edition	Nanda Maheshwari	Jaypee
	6	Textbook of Haematology/ 2 nd	Dr. Tejinder Singh	Arya Publications
	7	Practical Manual for Medical Laboratory Technology- Volume 2/ 2 nd	Mayuri Dholaria, Jigna Naik, Urvashi Desai & Rinku Shukla	New Popular Prakashan

Teaching Methodology	Theory: Lecture Based Learning, Discussion, Self-study, Seminar, Assignments, Technology Enhanced Teaching using Digital Tools Practical: Laboratory work, Direct Instruction with Demonstration, Journal Preparation, Experiments
Evaluation Method	Theory: Internal Assessment: 25 Marks: Internal test, Attendance, Class Assignments/ Seminar, Home Assignment External Assessment: 25 Marks: Semester end University examination Practical: Internal Assessment: 25 Marks: Attendance, Viva/ Internal practical examination, Lab Work External Assessment: 25 Marks: Semester and University examination

PGDMLT-2002: CLINICAL PATHOLOGY

Program Name	Post Graduate Diploma in Medical Laboratory Technology								
Semester	II								
NCrF Credit Level	6								
Course Type	Major								
Course Subtype	Employability								
Subject Type	Discipline Specific								
Course Code	PGDMLT-2002								
Course Level	400-499								
Course Title	Clinical Pathology								
Credit	Theory:	2	Practical:	2	Total:	4			
Effective From	Academic Year :2026-2027								
Course Outcome	• CO1: The students will understand the principles, composition, and clinical significance of urine, stool, sputum, and semen, including proper methods of collection, preservation, and transportation. • CO2: The processing of sputum and semen samples using standard laboratory will be studied and correlation of findings with relevant pathological conditions with safety measures. • CO3: Collection methods and physical, chemical, and microscopic examination of urine and stool, including identification of abnormal constituents and parasitic forms (ova & cysts) will be understood by students ethically. • CO4: The students will learn the composition and diagnostic importance of cerebrospinal fluid (CSF) and other body fluids, along with sample handling procedures with accuracy. • CO5: Different collection methods and physical, chemical, and microscopic analysis of CSF and body fluids (pleural, peritoneal, pericardial, synovial) to differentiate between normal and abnormal findings and proper quality findings. • CO6: The students will correlate abnormal laboratory findings (especially CSF and effusion fluids) with various disease conditions, including differentiation between transudate and exudates with scientific skill.								
Mapping between Cos and PSOs		PSO1	PSO2	PSO3	PSO4	PSO5	PSO6	PSO7	PSO8
	CO1								
	CO2								
	CO3								
	CO4								
	CO5								
	CO6								

Course Content			
Unit No.	Content	Teaching Hours	
Unit-1	Urine, Stool, Sputum & Semen Analysis	15	
1.1	Introduction, Composition, Indication, Collection, Preservation & Transportation		
1.2	Urine Analysis: Physical, Chemical & Microscopic Examination		
1.3	Stool Analysis: Physical, Chemical & Microscopic Examination, Stool concentration techniques for Ova and Cyst		
1.4	Sputum Analysis: Physical & Microscopic Examination		
1.5	Semen Analysis: Physical, Chemical & Microscopic Examination		
Unit-2	C.S.F and Body Fluid Analysis	15	
2.1	Introduction, Composition, Indication, Collection, Preservation & Transportation		
2.2	Physical, Chemical and Microscopic examination of C.S.F		
2.3	Correlation of Abnormal C.S.F. findings in various diseases		
2.4	Fluid Effusion: Transudate & Exudate		
2.5	Physical, Chemical and Microscopic examination of Pleural, Peritoneal, Pericardial and Synovial fluid		
PGDMLTP- 2002: PRACTICALS BASED ON CLINICAL PATHOLOGY			
Course content:			
1) Physical, Chemical & Microscopic examination of urine			
2) Physical, Chemical & Microscopic examination of stool			
3) Physical, Chemical & Microscopic examination of sputum			
4) Physical, Chemical & Microscopic examination of semen			
5) Physical, Chemical & Microscopic examination of cerebrospinal fluid			
6) Physical, Chemical & Microscopic examination of pleural fluid			
7) Physical, Chemical & Microscopic examination of peritoneal fluid			
8) Physical, Chemical & Microscopic examination of pericardial fluid			
9) Physical, Chemical & Microscopic examination of synovial fluid			
Reference Books			
Sr. No.	Title/Edition	Authors	Publisher
1	Textbook of Clinical Pathology for MLT	Jigna Naik & Ankita Leanwala	New Popular Prakashan
2	Textbook of Medical Laboratory Technology, Volume 1 / 3 rd	Praful B. Godkar & Darshan B. Godkar	Bhalani Publishing House Mumbai, India
3	Practical Manual for Medical Laboratory Technology- Volume 2/ 2 nd	Mayuri Dholaria, Jigna Naik, Urvashi Desai & Rinku Shukla	New Popular Prakashan
4	Medical Laboratory Technology Methods and Interpretations, Volume 1/ 6 th	Ramnik Sood	Jaypee Brothers Medical Publishers (P) LTD
5	Medical Laboratory Science -	Ochei & A Kolhatkar	Tata Mc Graw -

	Theory and Practice	Hill Publishing Limited Company, New Delhi
Teaching Methodology	Theory: Lecture Based Learning, Discussion, Self-study, Seminar, Assignments, Technology Enhanced Teaching using Digital Tools Practical: Laboratory work, Direct Instruction with Demonstration, Journal Preparation, Experiments	
Evaluation Method	Theory: Internal Assessment: 25 Marks: Internal test, Attendance, Class Assignments/ Seminar, Home Assignment External Assessment: 25 Marks: Semester end University examination Practical: Internal Assessment: 25 Marks: Attendance, Viva/ Internal practical examination, Lab Work External Assessment: 25 Marks: Semester end University examination	

PGDMLT-2003: CLINICAL BIOCHEMISTRY

Program Name	Post Graduate Diploma in Medical Laboratory Technology					
Semester	II					
NCrF Credit Level	6					
Course Type	Major					
Course Subtype	Employability					
Subject Type	Discipline Specific					
Course Code	PGDMLT- 2003					
Course Level	400-499					
Course Title	Clinical Biochemistry					
Credit	Theory:	2	Practical:	2	Total:	4
Effective From	Academic Year: 2026-2027					
Course Outcome	• CO-1: The students will gain knowledge of biochemistry, biomolecules and their functions. • CO-2: The students will understand the regulation of biochemical contents and their clinical significance. • CO-3:The students will be able to understand the laboratory investigations and clinical corelations. • CO-4: The students will acquire skill to perform and interpret biochemical analysis.					
Course Content	Unit No.	Content				Teaching Hours
	Unit-1	Carbohydrate and Protein				15 Hr.
	1.1	Definition, Classification and Function				
	1.2	Regulation of blood glucose and Diabetes Mellitus				
	1.3	GTT and Glycosylated Haemoglobin				
	1.4	Plasma Proteins: Function, Clinical significance and A:G ratio				
	1.5	Electrophoretic pattern of protein fractions in health and disease				
	Unit-2	Lipid, Lipoproteins and Enzymology				15 Hr.
	2.1	Definition, Classification and Function				
	2.2	Factors influencng and Pathological variations of blood cholesterol level				
	2.3	Lipoprotein Metabolism and Clinical Disorder				
	2.4	Clinical Enzymology and Clinical Importance of Isoenzymes: LDH, CK, ALP				
	2.5	Serum Enzymes in Liver Diseases and Heart Diseases				
	PGDMLTP- 2003: PRACTICALS BASED ON CLINICAL BIOCHEMISTRY					
	Course content:					
1) Estimation of blood Sugar						

	2) Glucose Tolerance Test 3) Serum Total Protein, Albumin, Globulin and A: G Ratio 4) Microalbumin test 5) Serum Urea and Blood Urea Nitrogen (BUN) 6) Serum Creatinine 7) Serum Uric acid 8) Serum Total Cholesterol and HDL Cholesterol 9) Serum Triglyceride (TG) 10) Serum Electrolytes: Potassium, Sodium, Chloride 11) Serum Calcium 12) Serum Total, Direct and Indirect bilirubin 13) Serum SGPT 14) Serum SGOT 15) Serum Amylase 16) Serum ALP								
Mapping between Cos and PSOs		PSO1	PSO2	PSO3	PSO4	PSO5	PSO6	PSO7	PSO8
	CO-1								
	CO-2								
	CO-3								
	CO-4								
Reference Books	Sr. No.	Title/Edition			Authors		Publisher		
	1.	A Text Book of Clinical Biochemistry for MLT			Dr. Mayuri Dholaria, Dr. Urvashi Desai		New Popular Prakashan		
	2.	Textbook of Medical Biochemistry/ 8 th			Chatterjae M. N. and Shinde R. (2012)		Jaypee Brothers Publishers		
	3.	Textbook of Medical Laboratory Technology/ 3 rd			Godkar P. B. (2014)		Bhalani Publishing house		
	4.	Textbook of Biochemistry/4 th			Vasudevan D.&SreekumariS.2005		Jaypee Publishers		
	5.	Biochemistry/ 4 th			Satyanarayana U. & Chakrapani U.		Arunabha Sen and Allied (P) Ltd.		
	6.	Practical Manual for Medical Laboratory Technology- Volume 2/ 2 nd			Mayuri Dholaria, Jigna Naik, Urvashi Desai & Rinku Shukla		New Popular Prakashan		
Teaching Methodology	Theory: Lecture Based Learning, Discussion, Self-study, Seminar, Assignments, Technology Enhanced Teaching using Digital Tools Practical: Laboratory work, Direct Instruction with Demonstration, Journal Preparation, Experiments								
Evaluation Method	Theory: Internal Assessment: 25 Marks: Internal test, Attendance, Class Assignments/ Seminar, Home Assignment External Assessment: 25 Marks: Semester end University examination Practical: Internal Assessment: 25 Marks: Attendance, Viva/ Internal practical examination, Lab Work External Assessment: 25 Marks: Semester end University examination								

PGDMLT-2004: IMMUNOHAEMATOLOGY

Program Name	Post Graduate Diploma in Medical Laboratory Technology								
Semester	II								
NCrF Credit Level	6								
Course Type	Major								
Course Subtype	Employability								
Subject Type	Discipline Specific								
Course Code	PGDMLT- 2004								
Course Level	400-499								
Course Title	Immunohaematology								
Credit	Theory:	2	Practical:	2	Total:	4			
Effective From	Academic Year: 2026-2027								
Course Outcome	• CO-1: The students will gain knowledge of blood group systems, performing blood collection and processing, interpreting immunohematology test result and understanding the clinical significance of transfusion practices. • CO-2: The students will understand the process of separating blood into different components, such as packed red cells, platelets, and plasma. • CO-3:The students will learn how to store and shelf life criteria for each component. • CO-4:The students will be able to understand the logistical organization of a blood bank, including managing the inventory of components. • CO-5: The students will be able to perform various techniques for all serological tests in blood banking • CO-6: The students will gain knowledge about transfusion reactions and its investigations								
Mapping between Cos and PSOs		PSO1	PSO2	PSO3	PSO4	PSO5	PSO6	PSO7	PSO8
	CO-1								
	CO-2								
	CO-3								
	CO-4								
	CO-5								
	CO-6								
Course Content	Unit No.	Content						Teaching Hours	
	Unit-1	Fundamental Aspects of Immunohaematology						15 Hr.	
	1.1	ABO Blood group system							
	1.2	RH Blood group system							
	1.3	Other blood group systems							
	1.4	Screening and Phlebotomy of Donor							
	1.5	Storage, Transportation of blood and Mandatory							

		Screening Tests of Donor		
	Unit-2	Blood Banking Techniques and Transfusion reaction	15 Hr.	
	2.1	Blood component Preparation- Red Cell Concentrate, Fresh Frozen Plasma, Platelet Concentrate, Cryoprecipitate, Single Donor Platelet		
	2.2	Antiglobulin tests: Direct and Indirect		
	2.3	Compatibility Testing: Blood grouping, Cross matching		
	2.4	Mechanism and Investigation of HDN		
	2.5	Transfusion reactions: Types and Investigation		
PGDMLTP- 2004: PRACTICALS BASED ON IMMUNOHAEMATOLOGY				
Course content: 1. ABO and RH (Forward) grouping by Slide Method 2. ABO and RH (Forward) grouping by Tube Method 3. ABO Reverse grouping 4. Direct Anti-Human globulin test 5. Indirect Anti-Human globulin test 6. Test for Weak D: Albumin Replacement Technique 7. Test for Weak D: Indirect Antiglobulin Test 8. Determination of Anti A titer 9. Determination of Anti B titer 10. Cross matching				
Reference Books	Sr. No.	Title/Edition	Authors	Publisher
	1.	Compendium Transfusion Medicine.	Dr R. N Makroo	KONGPOSH publication Pvt. Ltd., New Delhi
	2.	A textbook of Immunohaematology & Histocytology (Blood Banking) for MLT 2024	Rinku Shukla & Twinkle Patel	New Popular Prakashan, Surat
	3.	Clinical pathology, Haematology and Blood Banking, 4 th Edition	Nanda Maheshwari	Jaypee Brothers; New Delhi
	4.	Textbook of Medical Laboratory Technology, Volume 2/ 3 rd	Praful B. Godkar& Darshan B. Godkar	Bhalani Publishing House Mumbai, India
	5.	Essentials of Blood Banking and Transfusion Medicine	Ganga S. Pilli	CBS Publishers, New Delhi
	6.	Practical Manual for Medical Laboratory Technology- Volume 2/ 2 nd	Mayuri Dholaria, Jigna Naik, Urvashi Desai & Rinku Shukla	New Popular Prakashan
Teaching Methodology	Theory: Lecture Based Learning, Discussion, Self-study, Seminar, Assignments, Technology Enhanced Teaching using Digital Tools Practical: Laboratory work, Direct Instruction with Demonstration, Journal Preparation,			

	Experiments
Evaluation Method	Theory: Internal Assessment: 25 Marks: Internal test, Attendance, Class Assignments/ Seminar, Home Assignment External Assessment: 25 Marks: Semester end University examination Practical: Internal Assessment: 25 Marks: Attendance, Viva/ Internal practical examination, Lab Work External Assessment: 25 Marks: Semester end University examination

PGDMLT- 2005: TRAINING IN CLINICAL LABORATORY

Program Name	Post Graduate Diploma in Medical Laboratory Technology								
Semester	II								
NCrF Credit Level	Level 6								
Course Type	Internship / Vocational								
Course Subtype	Skill Development								
Subject Type	Discipline Specific Vocational Education								
Course Code	PGDMLT- 2005								
Course Level	400-499								
Course Title	Training in Clinical Laboratory								
Credit	Theory:	-	Practical: Training	4	Total:	4			
Effective From	Academic Year: 2026-2027								
Course Outcome	After completion of this course, the student will be able to: • CO1: Demonstrate practical competency in clinical laboratory settings relevant to real-world applications. • CO2: Perform accurate, reliable, and safe laboratory investigations in: Clinical Microbiology, Immunology/Serology, Pathology, Hematology, Clinical Biochemistry • CO3: Operate and maintain modern laboratory instruments, equipment, and automation systems. • CO4: Apply laboratory safety protocols, able to communicate with patients and doctors, understand how to do work in laboratory, quality assurance practices, and biomedical waste management guidelines. • CO5: Develop skills in data processing, result reporting, documentation, and laboratory record maintenance. • CO6: Utilize laboratory services effectively and ethically in clinical settings.								
Mapping between Cos and PSOs		PSO1	PSO2	PSO3	PSO4	PSO5	PSO6	PSO7	PSO8
	CO1								
	CO2								
	CO3								
	CO4								
	CO5								
	CO6								
Course Content	Course Aim The aim of training is to bridge the gap between the level of knowledge acquired in academic institutions settings and its practical application in the field of work in the clinical laboratory environments. Course Objectives								

	• To provide structured hands-on training in real clinical laboratory environments, enabling students to acquire practical skills relevant to their field of study. • To develop technical proficiency in handling laboratory instruments, equipment, and automation systems used in modern diagnostic laboratories. • To expose students to standard laboratory workflows, diagnostic procedures, and clinical decision-support practices followed in healthcare settings. • To facilitate the transition from academic learning to professional practice by familiarizing students with workplace culture, responsibilities, and expectations. • To enhance employability by equipping students with industry-relevant competencies, professional conduct, and job readiness skills. • To promote effective communication, interpersonal relationships, and teamwork within multidisciplinary healthcare environments. • To instill professional ethics, quality consciousness, and adherence to laboratory safety and regulatory standards. • To provide opportunities for applying theoretical knowledge to real-life clinical situations, thereby bridging the gap between academic training and practical application. Course Content / Training Structure Total Duration: 180 Hours • Suggested schedule: 6 hours/day × 30 days = 180 hours or as per convenience THE TRAINING MUST BE IN SECOND SEMESTER ONLY Overview This internship provides comprehensive practical exposure across all major sections of a clinical laboratory under supervision of a qualified Pathologist / Clinical Laboratory Scientist. Students will be trained to: • Perform routine and specialized laboratory investigations • Maintain quality and accuracy of results • Follow SOPs and accreditation guidelines (NABL/ISO 15189 concepts) Training Areas: Hematology, Clinical Biochemistry, Immunology / Serology, Clinical Pathology, Clinical Microbiology and Blood Banking (where applicable) Professional Skills Development • Laboratory safety & biosafety practices • Biomedical waste management (as per Government of India/State regulations) • Documentation and LIS (Laboratory Information System) • Communication with patient • Ethical practices in diagnostics Students must maintain Daily Work Logbook as given below (mandatory) <table><tr><td>Date</td><td>Entry and Exit time</td><td>Activities/ Procedures performed or observed</td><td>Skills acquired</td><td>Supervisor signature</td></tr></table>	Date	Entry and Exit time	Activities/ Procedures performed or observed	Skills acquired	Supervisor signature
Date	Entry and Exit time	Activities/ Procedures performed or observed	Skills acquired	Supervisor signature		

Format of Report	Students have to prepare HANDWRITTEN Laboratory Training Report as given below points/ chapters: 1) Title Page: Includes the report title, your name, student/employee ID, the department or organization, and the date of submission etc. 2) Table of Contents: List all sections and sub-sections with page numbers. 3) Objectives of the Training: 4) Background of the Organization: A brief overview of the laboratory where you trained. 5) SOPs and Instruments 6) Work Done and Work Observed: Training area wise * Use Tables and Figures to present results. * Interpret your findings. * Discuss how the theory you learned is applied to the real-world lab environment. 7) Skills Acquired: Highlight the specific competencies you gained, categorized for easy reading: * Technical Skills: e.g., Titration, sample preparation, microbial culturing. * Soft Skills: e.g., Time management in a high-pressure environment, teamwork, or technical writing. 8) Abstract/Executive Summary: A concise (150–250 words) overview of the training period. Mention the core skills acquired.																				
Teaching Methodology	Medical laboratory technology training • Direct field training in: ○ Hospitals ○ Primary Health Centers (PHC) ○ Community Health Centers (CHC) ○ Private Diagnostic Laboratories ○ Blood Banks • Supervised hands-on practice • Demonstration + Performance-based learning • Case-based exposure																				
Evaluation Method	Internal Assessment (CCE): <u>50</u> Marks (At Clinical Laboratory level) <table><tr><th>Type of Justification</th><th>Attendance</th><th>Skill</th><th>Discipline</th><th>Total</th></tr><tr><td>Marks</td><td>10</td><td>30</td><td>20</td><td>50</td></tr></table> External Assessment (SEE): <u>50</u> Marks (At University level) <table><tr><th>Type of Justification</th><th>Report</th><th>Presentation</th><th>Viva</th><th>Total</th></tr><tr><td>Marks</td><td>20</td><td>20</td><td>10</td><td>50</td></tr></table> Certification Requirements To successfully complete the course, students must submit: • Training Completion Certificate Signed by Pathologist / Lab Authority • Certified Project Report / Laboratory Study Report	Type of Justification	Attendance	Skill	Discipline	Total	Marks	10	30	20	50	Type of Justification	Report	Presentation	Viva	Total	Marks	20	20	10	50
Type of Justification	Attendance	Skill	Discipline	Total																	
Marks	10	30	20	50																	
Type of Justification	Report	Presentation	Viva	Total																	
Marks	20	20	10	50																	

PGDMLT-2006: HISTO-CYTOLOGICAL TECHNIQUES

Program Name	Post Graduate Diploma in Medical Laboratory Technology								
Semester	II								
NCrF Credit Level	6								
Course Type	SEC								
Course Subtype	Employability								
Subject Type	Discipline Specific								
Course Code	PGDMLT- 2006								
Course Level	400-499								
Course Title	Histo-Cytological Techniques								
Credit	Theory	2	Practical	0	Total	2			
Effective From	Academic Year: 2026-2027								
Course Outcome	At the end of course students will be • CO-1: Able to learn about collectionof histological specimens, their fixation, fixatives, decalcifying agents and dehydrating agents. • CO-2: They will be able to carry out basic steps of tissue processing and embedding. • CO-3: They will learn to operate basic microtome, cut sections, stain and mount various them. • CO-4: General cytological changes in cell during malignancy and will be aware of various branches of cytology. • CO-5: They also get knowledge of methods of cytological specimen collection, preservation and processing steps. • CO-6: They will get knowledge of FNAC technique, its advantages and disadvantages. They will also learn to preserve and mount samples in museums.								
Mapping between COs and PSOs		PSO1	PSO2	PSO3	PSO4	PSO5	PSO6	PSO7	PSO8
	CO-1								
	CO-2								
	CO-3								
	CO-4								
	CO-5								
	CO-6								
Course Content -	Unit No.	Content							Teaching Hours
	Unit-1	Histological Techniques							15 Hr.
	1.1	Types of specimens							
	1.2	Fixation and Decalcification							
	1.3	Steps of Tissue processing and Embedding : Manual and Automated							
	1.4	Types of Knife, Types of Microtome and Microtomy							
	1.5	Staining Techniques: H & E staining, Mounting of sections.							

	Unit-2	Cytological Techniques			15 Hr.
	2.1	Types of Exfoliation and General cytological changes in cell during malignancy			
	2.2	Role and Branches of Diagnostic Cytology			
	2.3	Collection, preservation, smear preparation and fixation Cytological specimens			
	2.4	Interventional cytology			
	2.5	Museum Techniques			
Reference Books	Sr. No.	Title/Edition	Authors	Publisher	
	1	Textbook of Medical Laboratory Technology, 3 rd , (2014)	Godkar P. B.	Bhalani Publishing House.	
	2	Textbook of Pathology, 5th ed., (2005).	Mohan H.	Jaypee Brothers Medical publishers (P) LTD.	
	3	Medical Laboratory Science: Theory and Practice, (2000)	Ochei J. and Kolhatkar A.	Mc Graw Hill Education (India) Private Limited, New Delhi.	
	4	Techniques in Histopathology and Cytopathology, 1 st ed., (2017)	Sadhana Vishwakarma	Jaypee brothers	
	5	A textbook of Immunohaematology & Histocytology (Blood Banking) for MLT 2024	Rinku Shukla & Twinkle Patel	New Popular Prakashan, Surat	
	6	Practical Manual for Medical Laboratory Technology- Volume 2/ 2 nd	Mayuri Dholaria, Jigna Naik, Urvashi Desai & Rinku Shukla	New Popular Prakashan	
	Teaching Methodology	Theory: Lecture Based Learning, Discussion, Self-study, Seminar, Assignments, Technology Enhanced Teaching using Digital Tools			
Evaluation Method	Theory: Internal Assessment: 25 Marks: Internal test, Attendance, Class Assignments/ Seminar, Home Assignment External Assessment: 25 Marks: Semester end University examination				