

CURRICULUM
FOR
DIPLOMA PROGRAMME
IN
MEDICAL LABORATORY TECHNOLOGY
3rd Year
FOR THE STATE OF HIMACHAL PRADESH



N-2022

Prepared by:-

Composite Curriculum Development Centre

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THREE YEAR DIPLOMA IN MEDICAL LABORATORY TECHNOLOGY

SALIENT FEATURES

Programme	Diploma in Medical Laboratory Technology
Duration	Three years (Six Semesters)
Entry Qualification	As prescribed by H.P. Takniki Shiksha Board /AICTE
Intake	As approved by H.P. Takniki Shiksha Board
Pattern	Semester System

PROGRAM OUTCOMES (POs)

- PO1:** Basic and Discipline Specific Knowledge : Apply knowledge of basic mathematics, science and engineering fundamentals and engineering specialization to solve the engineering problems.
- PO2:** Problem Analysis : Identify and analyze well-defined engineering problems using codified standard methods.
- PO3:** Design/ Development of Solutions : Design solutions for well-defined technical problems and assist with the design of systems components or processes to meet specified needs.
- PO4:** Engineering Tools, Experimentation and Testing : Apply modern engineering tools and appropriate technique to conduct standard tests and measurements.
- PO5:** Engineering Practices for Society, Sustainability and Environment : Apply appropriate technology in context of society, sustainability, environment and ethical practices.
- PO6:** Project Management : Use engineering management principles individually, as a team member or a leader to manage projects and effectively communicate about well-defined engineering activities.
- PO7:** Life-long Learning : Ability to analyze individual needs and engage in updating in the context of technological changes.

PROGRAMME SPECIFIC OUTCOMES

The Programme outcomes are derived from five domains namely Process, Professional Knowledge, Professional Skill, Core Skill, Responsibility, after completing this level, the student will be able to:

PSO1: Acquire knowledge of Basic facts, process and principles related to medical laboratory technology for employment.

PSO2: Demonstrate practical skill in narrow range of medical laboratory technology applications.

PSO3: Perform task under close supervision with some responsibility for own work within defined limit.

HORIZONTAL AND VERTICAL ORGANISATION OF THE SUBJECTS

Sr. No.	Subjects/Areas	Distribution in Hours per week in various Semesters					
		I	II	III	IV	V	VI
1	Practical Professional Training- I	-	-	-	-	36	-
2	Practical Professional Training- II	-	-	-	-	-	36
	-	-	-	-		36	36

DIPLOMA PROGRAMME STUDY AND EVALUATION SCHEME

FIFTH SEMESTER

Sr. No.	Subject code	SUBJECTS	STUDY SCHEME Periods/Week			Total Study Hrs	Credits	MARKS IN EVALUATION SCHEME									Total Marks
			L	P	DCS			INTERNAL ASSESSMENT			EXTERNAL ASSESSMENT						
								Th	Pr	Total	Th	Hrs	Pr	Hrs	Total		
1.1	(MLT501)	Practical Professional Training-1 (Structured And Supervised) (Separate Weightage for each specialized lab)	-	36	-	36	18	-	75x4	300	-	-	125x4	3x4	500	800	
		Total	-	36	-	36	18	-	300	300	-	-	500	-	500	800	

*A personality Development camp of two to three days duration to be conducted during Fifth Semester.

DIPLOMA PROGRAMME STUDY AND EVALUATION SCHEME

SIXTH SEMESTER

Sr. No.	Subject code	SUBJECTS	STUDY SCHEME Periods/Week			Total Study Hrs	Credits	MARKS IN EVALUATION SCHEME									Total Marks
			L	P	DCS			INTERNAL ASSESSMENT			EXTERNAL ASSESSMENT						
								Th	Pr	Total	Th	Hrs	Pr	Hrs	Total		
1.1	(MLT601)	Practical Professional Training-II Structured And Supervised) (Separate Weightage for eachspecialized lab)	-	36	-	36	18	-	75x4	300	-	-	125x4	3x4	500	800	
		Total	-	36	-	36	18	-	300	300	-	-	500	-	500	800	

*A personality Development camp of two to three days duration to be conducted during Sixth Semester.

DETAILED CONTENTS 3rd YEAR

Fifth Semester

PERSONALITY DEVELOPMENT CAMP

This is to be organized at a stretch for two to three days during the fifth and sixth semester. Extension Lectures by experts or teachers from the polytechnic will be delivered on the following broad topics. There will be no examination for this subject.

1. Communication Skills
2. Correspondence and job finding/applying/thanks and follow-up
3. Resume Writing
4. Interview Techniques: In-Person Interviews; Telephonic Interview'
Panel interviews; Group interviews and Video Conferencing etc.
5. Presentation Techniques
6. Group Discussions Techniques
7. Aspects of Personality Development
8. Motivation
9. Leadership
10. Stress Management
11. Time Management
12. Interpersonal Relationship
13. Health and Hygiene

Course Outcomes

After undergoing the subject, the student will be able to:

1. Apply professional qualification and competence with good communication skills.
2. Apply knowledge of soft skills to get good jobs or to rise steadily at their workplace.
3. Meet employability requirements in the job market and survive in cut throat competition among professionals.

Course Code	:	MLT 501
Course Title	:	Practical Professional Training-I
Number of Credits	:	18 (L: 0 T: 0, P: 18 DCS:0)
Prerequisites	:	NIL
Course Category	:	PC

FIFTH SEMESTER

5. PRACTICAL PROFESSIONAL TRAINING – I (Structured and Supervised)

L P D
- 36 -

Course Objective

The objective of providing professional training is to:

1. Provide real life experience by creating necessary awareness regarding use of various types of diagnostic equipment, particularly sophisticated ones which are used in the field of medical laboratory technology.
2. Create confidence in the students to work in world of work by developing practical skills pertaining to laboratory management and diagnostic skills in the field of clinical haematology, transfusion medicine blood banking, clinical biochemistry, clinical microbiology, histopathology and cytology and ensuring laboratory safety and quality assurance.
3. Develop appreciation regarding size and scale of operations, environment and other related aspects like value of teamwork, interpersonal relations and professional ethics in the field of medical laboratory technology.
4. Develop necessary traits for starting small clinical laboratories as per requirements.

SELECTION OF TRAINING PLACES

The institute offering diploma programme in Medical Laboratory Technology should establish contact/rapport by personal visit to following types of organizations:

1. Medical Colleges/Research institutions
2. Civil Hospitals at District Headquarters having well equipped laboratory
3. Hospitals in private sector
4. Well established clinical laboratories being run by a qualified person.

LIST OF PRACTICALS

List of exercises is suggested below which should be carried out during 5th semester
The weightage of marks should be divided equally into four labs of clinical Microbiology, clinical Biochemistry, Clinical Haematology and Clinical Histopathology and Cytology.

1. Preparation of various anticoagulants/containers
2. Collection of various clinical samples
3. Haemoglobin estimation
4. TLC, DLC, ESR, PCV, BT & CT
5. Absolute Eosinophil Count
6. APTT/PTTK
7. Prothrombin Time & calculation of INR
8. Blood Sugar – Random/Fasting/PP
9. GTT/ST
10. Urine – Complete examination
11. Stool – Complete examination
12. RA/RF factor

13. ABO and Rh blood grouping
14. Widal test
15. VDRL test
16. Cleaning of glassware
17. Disposal of Medical wastes (use of bags)
18. Staining of blood film
19. H&E staining
20. Spotting

In addition to the above, students are expected to learn various tests being conducted at the training centre, wherever they are undergoing training.

Note:

1. The Principal of the institute where the diploma programme in Medical Laboratory Technology is being offered, with the help of Directorate of Technical Education/Secretary, Technical Education may approach Director, Health Services/Director, Medical Education/Secretary, Health to collaborate in offering structured and supervised project work/practical training of students in above organizations. It will be worthwhile to sign a "Memorandum of Understanding" regarding the involvement of students in undergoing practical training
2. The Principal of the institute may also approach Regional Apprenticeship Adviser (Northern Region), Kanpur to provide training seats under Apprenticeship Act to the students.

METHODOLOGY OF ORGANISING PROFESSIONAL TRAINING

Each concerned teacher will be responsible for a group of minimum 10 students in respective specialties to plan, supervise and monitor the progress when placed in different organizations for practical training for minimum 8 hrs/week. For this purpose, necessary recurring expenditure for making payment of TA/DA to the faculty of institute and the experts may be worked out by respective institutes, keeping in view, number of visits and the distances involved in such travelling. The concerned teacher will have to continuously interact with training centers to monitor the progress of the students.

EVALUATION OF STUDENTS FOR PROFESSIONAL TRAINING

Professional training will have 800 marks. Out of which 300 marks will be awarded by the organization in consultation with concerned teachers where placed for practical/professional training and 500 marks are for (Board) external examination. The criteria for internal assessment will be as under:

a) Criteria for internal assessment by organization where placed (%) for practical/professional Training	Weightage
1. Attendance/Punctuality	10
2. Proficiency in conducting laboratory test	30
3. Preparation of portfolio based on day to day work done in various laboratories	20
4. Initiative/responsibility exhibited	10
5. Interpersonal relations	10
6. Behaviour /attitude	10
7. Maintenance of equipment and workplace	10

GENERAL GUIDELINES

1. The students are expected to prepare a practical record book as per the given list of the experiments. Besides, they can also add other experiments as well.
2. External examiner along with the internal faculty should evaluate the student's performance through viva-voce/spotting/performance and synopsis.

COURSE OUTCOME

After undergoing the subject, the student will be able to:

1. Use of various types of diagnostic equipment, particularly sophisticated ones which are used in the field of medical laboratory technology.
2. Work in world of Actual practices by developing practical skills pertaining to laboratory management and diagnostic skills in the field of clinical haematology, transfusion medicine blood banking, clinical biochemistry, clinical microbiology, histopathology and cytology and ensuring laboratory safety and quality assurance.
3. To develop appreciation regarding size and scale of operations, environment and other related aspects like value of team work, interpersonal relations and professional ethics in the field of medical laboratory technology.
4. Develop necessary traits for starting small clinical laboratories as per requirements.

DETAILED CONTENTS 3rd YEAR
Sixth Semester

Course Code	:	MLT 601
Course Title	:	Practical Professional Training-II
Number of Credits	:	18 (L: 0 T: 0, P: 18 DCS:0)
Prerequisites	:	NIL
Course Category	:	PC

SIXTH SEMESTER

PRACTICAL PROFESSIONAL TRAINING – II (Structured and Supervised)

L P D
- 36 -

Course Objective

The objective of providing professional training is to:

1. Provide real life experience by creating necessary awareness regarding use of various types of diagnostic equipment, particularly sophisticated ones which are used in the field of medical laboratory technology.
2. Create confidence in the students to work in world of work by developing practical skills pertaining to laboratory management and diagnostic skills in the field of clinical haematology, transfusion medicine blood banking, clinical biochemistry, clinical microbiology, histopathology and cytology and ensuring laboratory safety and quality assurance.
3. Develop appreciation regarding size and scale of operations, environment and other related aspects like value of teamwork, interpersonal relations and professional ethics in the field of medical laboratory technology.
4. Develop necessary traits for starting small clinical laboratories as per requirements.

SELECTION OF TRAINING PLACES

The institute offering diploma programme in Medical Laboratory Technology should establish contact/rapport by personal visit to following types of organizations:

1. Medical Colleges/Research institutions
2. Civil Hospitals at District Headquarters having well equipped laboratory
3. Hospitals in private sector
4. Well established clinical laboratories being run by a qualified person

LIST OF PRACTICALS

List of exercises is suggested below which should be carried out during 6th semester. The weightage of marks should be divided equally into four labs of clinical Microbiology, clinical Biochemistry, Clinical Haematology and Clinical Histopathology and Cytology.

1. Reticulocyte count
2. Platelet count
3. Peripheral blood film examination
4. Sputum examination for AFB
5. Serum calcium
6. CSF examination
7. Lipid profile

8. Liver function test
9. Renal function test
10. Stool for occult blood
11. Urine for culture and sensitivity
12. Blood for culture and sensitivity
13. Semen culture
14. Pus culture and sensitivity
15. Staining of smears by various staining procedures
16. Biochemical testing
17. HIV Test
18. HbsAg test
19. ASO
20. Spotting
21. CRP
22. Pregnancy Test.

In addition to the above, students are expected to learn various tests being conducted at the training centre, wherever they are undergoing training.

Note:

1. The Principal of the institute where the diploma programme in Medical Laboratory Technology is being offered, with the help of Directorate of Technical Education/Secretary, Technical Education may approach Director, Health Services/Director, Medical Education/Secretary, Health to collaborate in offering structured and supervised project work/practical training of students in above organizations. It will be worthwhile to sign a "Memorandum of Understanding" regarding the involvement of students in undergoing practical training
2. The Principal of the institute may also approach Regional Apprenticeship Adviser (Northern Region), Kanpur to provide training seats under Apprenticeship Act to the students

METHODOLOGY OF ORGANISING PROFESSIONAL TRAINING

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2. Proficiency in conducting laboratory test	: 30
3. Preparation of portfolio based on day to day work done in various laboratories	20 :
4. Initiative/responsibility exhibited	: 10
5. Interpersonal relations	: 10
6. Behaviour/attitude	: 10
7. Maintenance of equipment and workplace	: 10

GENERAL GUIDELINES

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3. Develop appreciation regarding size and scale of operations, environment and other related aspects like value of team work, interpersonal relations and professional ethics in the field of medical laboratory technology.
4. Develop necessary traits for starting small clinical laboratories as per requirements.

Guidelines w.r.t Massive Open Online Courses (MOOCs) /Open Electives**a) Massive Open Online Courses (MOOCs)**

1. A student may opt for a MOOC mode course as open elective in 5th semester after due approval of the Principal as per the recommendations of respective Head of the Department.
2. The student opting for the open elective under MOOC shall apply for the same on the prescribed proforma and may take the course only after due recommendation from the concerned HOD and approval from the Principal of the institute.
3. The MOOC course/Subject opted by the student should preferably be offered by Swayam, IITBX, Spoken Tutorials, mooKIT etc. of minimum 12 weeks duration carrying 3 credits.
4. The MOOC course opted by the student must have the provisions of continuous evaluation and examination at the end of the course.
5. The certificate issued by the MOOC provider, after successful completion of a MOOC Course/Subject clearly showing the result and credits earned is to be submitted by the student to the institute for further submission to Himachal Pradesh Takniki Shiksha Board Dharamshala well in time.
6. The details of credits earned and the marks obtained by the students is to be submitted by the institute to the Himachal Pradesh Takniki Shiksha Board Dharamshala. The credits and grades are to be reflected in the Detailed Marks Certificate(DMC) of 5th semester.

b) Open Electives

1. The students can opt only for that open elective course which is offered by other than their respective department.
2. Open Elective will be offered by each Department subject to the availability of the Infrastructure, faculty and required relevant facilities.
3. The Courses/Subjects will be offered as per the criteria fixed by the Institution.
4. Institute shall ensure that Open Elective offered to the students should be such that he/she has not studied the same in earlier semester as open elective/core subjects.
5. The contents of open elective offered by different Departments/Branches are available with the curricula each Branch. However, the student can opt the open elective of
6. course/s offered by the other Branch/Department running in the Institute with due approval by the concerned Principal on the recommendation of concerned HOD as per the availability of Faculty as well as infrastructure of the Institute.