

SIXTH SEMESTER

Sr. No.	SUBJECTS	STUDY SCHEME Periods/Week		Credits (C) L+P=C	MARKS IN EVALUATION SCHEME						Total Marks of Internal & External
		L	P		INTERNAL ASSESSMENT			EXTERNAL ASSESSMENT			
					Th	Pr	Tot	Th	Pr	Tot	
6.1	Project Oriented Professional Training-II	-	35	0+18=18	-	200	200	-	300	300	500
	# Student Centered Activities (SCA)	-	-	-	-	-	-	-	-	-	-
	Total	-	35	18	-	200	200	-	300	300	500

19. HORIZONTAL AND VERTICAL SUBJECTS ORGANISATION

Sr. No.	Subjects/Areas	Hours Per Week	
		Fifth Semester	Sixth Semester
2.	Project Oriented Professional Training-I	35	-
3.	Project Oriented Professional Training-II	-	35
	Total	35	35

6.1 PROJECT ORIENTED PROFESSIONAL TRAINING – II

L P
- 35

RATIONALE

Project Oriented Professional Training is aimed at the application of knowledge and competencies gained in the previous semesters in an integrated manner towards addressing an issue in the industry/field, as per the interest and choice of both the industry and student. It also provide opportunities to the students to work relatively independently over extended and comprehensive periods of time. It is expected from the students to get acquainted with desired attributes for industrial/field environment. For this purpose, students are required to work in different establishments of world of work, and develop competencies.

COURSE OUTCOMES

After undergoing this course, the students will be able to:

CO1: Define the problem statement of the Industrial training as per industry need.

CO2: Develop the problem-solving skills in finding solutions to the problems in the world of work.

CO3: Acquire interpersonal skills and work as a team member.

CO4: Demonstrate the competence to apply knowledge and skills learnt earlier in the context of the project.

CO5: Apply the communication skills in writing and presenting the technical report.

GUIDELINES

The purpose of this project oriented professional training is to expose the students to the world of work and provide professional experience in real life situation. It is suggested that during the training, the student should remain attached with the various sections of industry/field for 3-4 weeks. The student will have to maintain a daily/weekly/monthly diary/work book and submit detailed reports of their activities periodically to their supervisor/teacher. These reports will be certified by the concerned/ authorized officer of the organization where the student is undergoing professional training and doing his/her

project. Each student is required to undergo one Professional Oriented Project according to his/her area of interest and the project report is to be submitted at the end of project.

The concerned teacher will guide and supervise the students on work stations (as far as possible) at regular intervals. A systematic plan of action is required to be prepared, well in advance, by the polytechnic in consultation with the organizations where professional training and project is going to be executed. The teacher should clearly specify the expected learning outcomes and schedule on periodic basis, preferably weekly or fortnightly basis, for the whole of the professional project/training period of students. Performa may be developed by the polytechnic Training and Placement Officer in consultation with the teachers and personnel from industry to monitor the progress of the students. The performa should be filled by the students on daily, weekly and monthly basis, and should be duly countersigned by the personnel from industry and concerned teacher/supervisor attached to the particular student. Each teacher is supposed to guide and supervise about 5 – 8 students, depending upon the strength of the students and teachers in the department.

A criteria for assessing student performance by the internal examiner (personnel from industry and supervisor) and external examiner (teachers and experts) are given in table below:

S. No.	Performance criteria for Internal Assessment	Weightage of marks (in %age)
1.	Punctuality and regularity	10%
2.	Initiatives taken by the student in learning at training workplace	10%
3.	Defining problem statement, approach and schedule (Planning)	20%
4.	Level /proficiency of new practical skills acquired	20%
5.	Preliminary Action Plan and Report	40%
TOTAL		100

S. No.	Performance criteria for External Assessment	Weightage of marks (in %age)
1.	Project Report	60%
2.	Presentation & Viva voce	40%
Total marks		100

Important Notes:

1. This criteria must be followed by the faculty and they may see the daily, weekly and monthly progress/reports, while awarding awards as per the above criteria.
2. Students may visit websites as their learning tool during industrial training, Search videos, animations, text material on internet for preparation of training report during the training period.

The external examiner, preferably, may be the person from different industry/organization/institution, who is well versed with the discipline/branch of project-oriented professional training of the students, so that she/he can properly evaluate the students on the above criteria

PRACTICAL EXERCISES

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

6.1 Haematology/Transfusion Medicine

1. Principle and working of the automated blood cell counter. Its function and care.
2. ESR estimations by Westergren and Wintrobe method in blood sample.
3. Determination of PCV in blood by Macrohematocrit Method and Microhematocrit Method.
4. Counting of Reticulocyte in blood sample. Calculate Red Cell Indices – MCV, MCH, MCHC.
5. To perform Sickling test on blood.
6. Estimation of foetal haemoglobin by alkali denaturation test.
7. Estimation of G6PD by Methylene Blue Reduction Test).
8. To perform red cell fragility test on blood.
9. Determination of bleeding time by Ivy's and Dukes method and clotting time by Lee and White method.
10. Demonstration of Hess test
11. Performance of Clot retraction test
12. Demonstration of Aspiration, Preparation, staining and examination of bone-marrow smears.
13. Demonstration of Laboratory diagnosis of various leukemias.
14. Demonstration of LE Cell.
15. Semen analysis.

6.2 Biochemistry/Advanced Instruments

1. To Performs/GTT using GOD-POD method
2. To estimate urea and creatinine in a given serum sample.
3. Principal and procedure of RT-PCR and biochemistry analyzer used in respective labs.
4. Serum Direct and total bilirubin estimation
5. SGOT and SGPT estimation
6. Serum amylase estimation
7. Serum ALP and ACP estimation
8. Serum calcium and potassium estimation
9. Serum triglyceride and total cholesterol estimation
10. Estimation of HDL, LDL and VLDL
11. Detection of ketone bodies in urine.
12. Detection of urinary creatinine.

13. Liver function test
14. Renal function test
15. Stool for occult blood

6.3 Microbiology/Molecular Immunology

1. Blood and Urine for culture and sensitivity
2. Staining of smears by Leishman, Giemsa, and Field stain.

13. Liver function test
14. Renal function test
15. Stool for occult blood

6.3 Microbiology/Molecular Immunology

1. Blood and Urine for culture and sensitivity
2. Staining of smears by Leishman, Giemsa, and Field stain.
3. Examination of smears for malarial parasite (*P. vivax* and *P. falciparum*)
4. Perform wet mount using LCB.
5. Collection and processing of samples for diagnosis of fungal infections in skin, hair, nail scrapings.
6. Perform Widal test by slide and tube method.
7. Perform ASO titre test.
8. Perform CRP test.
9. Perform Rheumatoid factor test.
10. Perform VDRL Test.
11. Perform HIV by ELISA test.
12. Perform HBsAg ELISA test.
13. Pregnancy (hCG) test
14. Identification of following adult worms/cyst from preserved specimen/ slides of Tapeworm, Roundworm, Hookworm and *Entamoeba histolytica*
15. Perform RT- PCR test for COVID 19

6.4 Histopathology/Cytology

1. Demonstration of cryostat and Processing of tissue for frozen section
2. Staining and mounting of frozen section using H&E stain (rapid method).
3. To stain paraffin embedded section for the demonstration of reticulin fibers by Silver impregnation stain.
4. To stain paraffin embedded section using Oil Red "O" stain.
5. Preparation of Kaiserling's solution I and II for museum specimens.
6. Preparation of various mounting reagents for museum specimens
7. Processing and Labeling of various museum specimens
8. Demonstration and care of autopsy instruments

9. Preparation of dry smear and wet smear
10. To perform PAP stain
11. Fixation of smears and staining with MGG
12. To perform Harmonal Assessment
13. To perform PAS staining method of cytological sample.
14. To perform ZN staining method of cytological sample.
15. Demonstration of automatic tissue processor.

In addition to the above, students are expected to learn various tests being conducted at the training

6. Perform Widal test by slide and tube method.
7. Perform ASO titre test.
8. Perform CRP test.
9. Perform Rheumatoid factor test.
10. Perform VDRL Test.
11. Perform HIV by ELISA test.
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9. Preparation of dry smear and wet smear
10. To perform PAP stain
11. Fixation of smears and staining with MGG
12. To perform Hormonal Assessment
13. To perform PAS staining method of cytological sample.
14. To perform ZN staining method of cytological sample.
15. Demonstration of automatic tissue processor.

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

Note:

1. The Principal of the institute where 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 free of cost 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 free 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