

Pune District Education Association's Prof. Ramkrishna More Arts, Commerce and Science College Akurdi, Pune – 411044.

MEDICAL LABORATORY TECHNOLOGY (SHORT TERM COURSE) DEPARTMENT OF ZOOLOGY

Duration: 3 Months

Course fee –Rs. 1000

About The College:

Prof. Ramkrishna More Arts, Commerce and Science College, Akurdi, Pune-44 was established in June 1992. Ever since the day of establishment the college started functioning in its own spacious, well-furnished and well-equipped building (Classrooms, Laboratories, Library, Administrative block. etc.) The college has many distinguished teachers with reference to academic, sports, NSS activity and other Personal Achievements.

We have teachers who are actively engaged in continuous research activities. The college and management have put in their sincere efforts to introduce traditional courses at UG and PG level, with their specializations.

We have introduced 16 PG courses & research center in Economics, approved by the University of Pune and Sanctioned by the Government of Maharashtra.

After Successful completion of UGC norms, the college has received 2(f) and 12(b) status from UGC, New Delhi in the year 2001-02. Immediately after this, college has availed the financial assistance from UGC under the various Schemes.

Objectives of the Course:

- To provide the knowledge about Medical Laboratory Technology
- Basic knowledge of haematological tests
- To understand different techniques of laboratory tests
- To make the students ready for further education in the healthcare field

Duration: 3 Months

Course fee –Rs. 1000 only

About the course:

Add-on Course on Medical Laboratory Technology (MLT) is an Undergraduate Program offered by Department of Zoology of our College for Undergraduate students.

Medical Laboratory Technology also called Clinical laboratory science is an allied health profession which is concerned with the diagnosis, treatment and prevention of disease through the use of clinical laboratory tests. These tests help doctors to detect, diagnose and treat diseases. A Medical Laboratory Technologist (MLT) do these tests by analyzing body fluids, tissues, blood typing, microorganism screening, chemical analyses, cell counts of human body etc. They play an important role in collecting the information's needed, sampling, testing, reporting and documentation of these investigations. They determine the presence, extent or absence of disease and provide data needed to evaluate the effectiveness of treatment. There are two levels of medical laboratory workers - Technicians and Technologists.

Medical technologists work in five major areas of the laboratory i.e., in Blood banking, Clinical Chemistry (chemical analysis of body fluids), Hematology (blood related), Immunology (study of immune system) and Microbiology (study of bacteria and other disease organisms). They also work in the areas of cytotechnology (study of human tissue), phlebotomy, urinalysis, coagulation, parasitology and serology. Phlebotomists draw and test blood, whereas Blood bank technologists determine correct blood types for transfusions. Histology technicians cut and stain tissue samples.

Medical technologists have more training and job responsibilities. They perform complex tests such as microscopic examinations of tissues, blood and other body fluids to detect evidence of disease and detect the presence of bacteria, fungi, parasites etc. and chemical tests to determine blood cholesterol levels. They also match blood samples for transfusions and test drug levels in blood to determine how patients are responding to medications. They are often responsible for making sure that testing is done accurately. In some labs, technologists conduct research under the supervision of medical researchers.

Medical technicians do routine laboratory testing manually according to instructions. They work under Technologists or supervisors. Technicians may prepare specimens and operate machines that automatically analyze samples. In addition to running tests, technicians set up, clean, and maintain laboratory equipment, such as centrifuges, microscopes etc. They also prepare standard solutions for use in the lab. This involves measuring and mixing the correct amount of various chemicals.

Medical laboratory professionals have unlimited choices of practice settings. Hospitals, clinics, nursing homes, public health facilities, and commercial laboratories all have positions open right now for qualified laboratory professionals. In these settings, communication and research skills are highly valued. Employment of clinical laboratory workers is expected to grow as the volume of laboratory tests increases with population growth and the development of new types of tests.

Career Opportunities:

Given the focus on the healthcare and the demand for allied health professionals, career opportunities for clinical lab professionals is expected to grow faster than the average of all other occupations.

- Scientific: Work as laboratory technologist at hospitals, Pharmaceutical laboratories, Public Health laboratories, research & product development
- **Managerial:** Might get chance as Supervisor in laboratory, as consultant to laboratory medicine industry, Quality assurance companies, sales & marketing after graduate program
- **Educational:** Easier admission in courses of pathology professional, in laboratory medicine graduate program.

Course Curriculum:

Theory Topics- 08; Practicals 10

- 1. Introduction to Medical Laboratory Technology
- 2. Laboratory Equipment
- 3. Human Anatomy and Physiology
- 4. Method of collection of samples
- 5. Basic Haematological Tests
- 6. Haematological diseases
- 7. Pathological analysis
- 8. Histopathology and cytotechniques
- 9. Practical

Total Faculties:- 06

Faculty:

- 1. Dr. A. A. Shaikh
- 2. Dr. A. J. Khandagle
- 3. Dr. R. A. Morey
- 4. Dr. R. P. Chatterjee
- 5. Prof. C. Redican
- 6. Prof. Supriya
- 7. Dr. Sayali Ingle (MBBS)
- 8. Prof. A. Bagade

CO-ORDINATOR

(Dr. A. A. Shaikh)

PRINCIPAL

(Dr. M.G. Chaskar)

DEPARTMENT OF ZOOLOGY

ADD-ON COURSE

MEDICAL LABORATORY TECHNOLOGY

SYLLABUS

Lecture: 40

Practical: 10

THEORY

10. Introduction to Medical Laboratory Technology

- a. Healthcare Systems, Laboratory and Role of the Medical Laboratory Technician.
- b. Instruments and glassware used in pathological laboratories, cleaning, disinfection and sterilization, preparation of stains.
- c. Pathological diagnostic sections: biochemistry and haematology, microbiology and immunology, histology, radiology.

11. Laboratory Equipment

- a. Centrifuge and centrifugation techniques, principle, types and applications.
- b. Autoanalyzer: principle, types and applications.
- c. Chromatography: Definition, types, RF value, description of paper chromatography & applications.
- d. Spectrophotometer, flame photometer, colorimeter.

12. Human Anatomy and Physiology

- a. Introduction to Human anatomy
- b. Digestive system, respiratory system, cardiovascular system, excretory system, reproductive system.
- c. Nervous system, sense organs.
- d. Endocrine system.

13. Method of collection of samples

- a. Blood Collection: Methods of blood sample collection, use of anticoagulant in tests and preservation, shelf life of blood and serum.
- b. Collection of urine, stool, sputum, semen and tissues.
- c. Preservation and storage of samples.

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14. Basic Haematological Tests

- a. Complete blood picture: Blood cell morphology, blood cell count, platelet morphology, platelet count, Hb estimation, ESR, reticulocyte count, bleeding time, clotting time, prothrombin time, Erythrocyte Indices- MCV, MCH, MCHC.
- b. Preparation of blood films: Preparation of basic blood smear and Buffy coat smear, smear for diagnosis of blood parasites.
- c. Blood Grouping and cross matching.
- d. Serum and plasma separation, centrifugation.

15. Haematological diseases

- a. Anaemia: Introduction, types, causes, clinical investigations.
- b. Thalassemia: Introduction, causes, clinical investigations.
- c. Sickle cell anaemia: Introduction, causes, clinical investigations.
- d. Leukemia: Introduction, types, causes, clinical investigations.

16. Pathological analysis

- a. Analysis of body fluids
- b. Urine analysis
- c. Semen analysis
- d. Sputum analysis
- e. Stool analysis

17. Histopathology and cytotechniques

- a. Introduction to histology, histopathology, histotechniques and exfoliative cytology.
- b. Basic steps for Tissue Processing- Fixing, Embedding, Microtomy, Staining, Mounting, methods of decalcifications.
- c. Biopsy, PAP smear
- d. Storage of specimens

PRACTICAL:

- 1. Blood grouping and cross matching.
- 2. Blood cell count: RBC, WBC (Total Count, Differential Count).
- 3. Estimation of percentage haemoglobin.
- 4. Estimation of blood glucose.
- 5. Principle, working and handling of Colorimeter, Spectrophotometer and Centrifuge.
- 6. Microtomy and Histological Slides preparation.
- 7. Bleeding Time (BT) and Clotting Time (CT).
- 8. Preparation of blood smear and blood cell morphology.
- 9. Measurement of Pulse and Blood Pressure.
- 10. Drawing and collection of blood (venous).

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