छत्रपति शाहू जी महाराज विश्वविद्यालय, कानपुर

CHHATRAPATI SHAHU JI MAHRAJ UNIVERSITY, KANPUR

(पूर्ववर्ती कानपुर विश्वविद्यालय कानपुर)

Formerly Kanpur University, Kanpur – 208024

A Documentary Support

For

Matric No. – 1.1.1

Programme Outcomes & Course Outcomes

Under the

Criteria - I

(Curriculum Design and Development)

Key Indicator - 1.1

In

Matric No. – 1.1.1

B.Sc. Medical Laboratory Technology

Co-ordinator
Internal Quality Assurance Cell
CSJM University, Kanpur

(Registrar)
C.S.J.M.University
Kanpur

REGISTRAR
C.S.J.M. UNIVERSITY
KANPUR

B.Sc. in Medical Laboratory Technology

PROGRAM OUTCOMES

This profession holds so much importance

Medical Laboratory Professionals work in all areas of a clinical laboratory including blood banking, clinical bio-chemistry, haematology, immunology, histopathology and medical microbiology. They perform a full range of laboratory tests – from simple prenatal blood tests, to more complex tests to uncover diseases such as HIV/AIDS, diabetes, and cancer. They are also responsible for confirming the accuracy of test results, and reporting laboratory findings. The information obtained from a Medical Laboratory Scientist helps the physician influence the medical treatment a patient will receive. Medical Laboratory Scientists operate complex electronic equipment, computers and precision instruments costing millions of dollars. Medical Laboratory Professionals analyze human fluid samples using techniques available to the clinical laboratory, such as manual white blood cell differentials, bone marrow counts, analysis via microscopy, and advanced analytical equipment. They help physicians in choosing the correct laboratory tests and ensure proper collection methods. They receive patient specimens, analyze and interpret them, and report results. Medical Laboratory Professionals must recognize anomalies in their test results and know how to correct problems with the instrumentation. They monitor, screen, and troubleshoot analyzers featuring the latest technology available in the market. They perform equipment validations, calibrations, quality controls, ―STAT‖ or run-by-run assessment, statistical control of observed data, and recording of normal operations. To maintain the integrity of the laboratory process, medical laboratory scientists recognize factors that could introduce error and reject contaminated or substandard specimens, as well as investigate discrepant results. Common tests performed by Medical Laboratory Professionals are complete blood count (CBC), comprehensive metabolic panel (CMP), electrolyte panel, liver function tests (LFT), renal function tests (RFT), thyroid function test (TFT), urinalysis, coagulation profile, lipid profile, blood type, semen analysis (for fertility and post-vasectomy studies), serological studies and routine cultures. In some facilities that have few phlebotomists, or none at all, (such as in rural areas) Medical Laboratory Professionals may perform phlebotomy on patients, as this skill is part of their clinical training. The practical experience required to obtain a Bachelor's degree in Medical Laboratory Science gives these professionals a unique understanding of the inter-relationship between microbiological and chemical testing and the resulting clinical manifestations in clinical, scientific and industrial settings.

Medical laboratory science is the branch of science which deals with all the clinical laboratory investigations on clinical samples for laboratory diagnosis of various diseases. Blood, tissue and body fluids are analyzed and examined for various types of foreign organisms and abnormalities. This information is then used by the medical team to make decisions regarding a patient's medical care. 85% of all medical decisions are based on the results of clinical laboratory investigation reports.

Medical Laboratory Science is an important subject in the field of Medicine. In each system of Medicine, diagnosis of disease is a primary step because no treatment is possible without a proper diagnosis. It is the Medical Laboratory Technocrat, who performs this important task by various scientific tools and techniques. In today‘s modern world of technology, the diagnosis, treatment & prognosis of various diseases depends upon the results of investigations carried out in a clinical laboratory. Thus, these professionals play a key role in the field of health care. Medical Laboratory Science has played a significant role in the advancement in the field of Medicine, especially in past few decades. As modern medicine becomes more of a team effort, the Medical Laboratory Scientist/Technologist is an important member and integral part of the Medical team.

Outcome

• Collection and receiving of specimens (infectious samples i.e. blood, urine, stool, sputum, pus, semen, tissues and body fluids) for various biochemical, pathological, microbiological, haematological and blood bank investigations, etc.

• To perform and validate various investigations for the purpose of differential diagnosis • Calibration and standardization of glassware‘s and other laboratory equipment • Standardization and selection of test analytical procedures

• Maintenance of supplies of laboratory reagents / diagnostic kits

• Evaluation of reagents and diagnostic kit for diagnostic suitability

• Maintenance of quality control for reliability of laboratory reports

• Preparation of chemical and biological reagents

• Supervision, organization of work and personnel management

• Maintenance of records and preparation of statistics

• They look for bacteria, parasites, and other microorganisms; analyze the biochemical content of fluids; match blood for transfusions; and test for drug levels in the blood to show how a patient is responding to treatment

• Technologists also prepare specimens for examination, count cells, and look for abnormal cells in blood and body fluids

• They use automated equipment and computerized instruments capable of performing a number of tests simultaneously, as well as microscopes, cell counters, and other sophisticated laboratory equipment • Then they analyze the results and relay them to physicians

• With increasing automation and the use of computer technology, the work of Technologists has become less hands-on and more analytical

• The complexity of tests performed, the level of judgment needed, and the amount of responsibility workers assume depend largely on the amount of education and experience they possess • They make cultures of body fluid and tissue samples, to determine the presence of bacteria, fungi, parasites, viruses or other microorganisms

• Clinical laboratory technologists analyze samples for chemical content or a chemical reaction and determine concentrations of compounds such as blood glucose and cholesterol, enzymes and hormones levels

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B.Sc. in Medical Laboratory Technology

I YEAR

GENERAL PATHOLOGY AND GENERAL MICROBIOLOGY

MLT 101

Course Outcome:

- To provide general insight into the history and basics of General Pathology**.**
- To Impart knowledge about general outline of pathology**.**
- To provide brief knowledge about basic procedure done in pathology laboratory.
- To provide knowledge of bacteria, Sterilization etc.

HEMATOLOGY

MLT102

Course Outcome:

- To prepare the students for understanding of composition of blood**.**
- Students will learn basic haematoogical techniques. Students must be able to collect, preserve and process blood samples**.**
- Students will be able to perform routine investigations in clinical hematology laboratories**.**

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FUNDAMENTAL OF ANATOMY AND PHYSIOLOGY

MLT 103

Course Outcome

- Students will be able to learn the terminology of the subject**.**
- To Provide basic knowledge of cells, tissues, blood and to understand anatomy and physiology of human body**.**
- This subject will develop an understanding of the structure and function of organs and organ systems in normal human body**.**

BASICS OF BIOCHEMESTRY,CLINICAL PATHOLOGY,INSTUMENTS AND REAGENTS

MLT104

Course Outcome:

- To provide general insight and basic knowledge of basics of biochemistry**.**
- The students will be given the basic of knowledge of chemistry and metabolism of various metabolites**.**

B.Sc. in Medical Laboratory Technology II YEAR

BLOOD BANK PROCEDURE AND HEMOGLOBINOPATHIES

MLT 201

Course Outcome:

- The subject will provide detailed knowledge about Blood Bank Procedure.
- The students will be able to perform all procedures of blood banking.
- The students will be able to maintain blood bank records & issue blood.

ENDOCRINOLOGY,TUMOR,AND CANCER MARKERS MLT 202

Course Outcome:

- To provide knowledge about hormones**.**
- To provide knowledge about tumor markers and their assessment.

CLINICAL BIOCHEMISTRY

MLT 203

Course Outcome

- To identify the indications for basic procedures and perform them in appropriate manner.
- Subject will provide complete procedural knowledge used in Clinical Biochemistry.

- Pertains knowledge regarding how to analyze various clinical samples for estimation of clinical biochemistry**.**
- To provide knowledge about advance instrumentation and procedural knowledge of clinical biochemistry**.**

(By Colorimeter / Spectrophotometer)

1. Blood urea estimation
2. Serum creatinine estimation
3. Serum uric acid estimation
4. Serum total protein estimation
5. Serum albumin estimation
6. Serum globulin estimation
7. Serum Bilirubin total estimation
8. Serum Bilirubin direct estimation
9. Serum GOT (AST) estimation
10. Serum GPT (ALT) estimation
11. Alkaline phosphatase estimation
12. Acid phosphatase estimation
13 Blood Glucose Estimation
14 Serum amylase estimation
15 Total cholesterol estimation
15 HDL cholesterol (direct) estimation.
16 LDL cholesterol (direct) estimation
17 Triglyceride estimation
18 Serum sodium estimation
19 Serum potassium estimation
20 Serum chloride estimation
21 CK-NAC estimation

22 Other Tests

IMMUNOLOGY,SEROLOGY,AND PARASITOLOGY
MLT 204

Course Outcome

- To provide knowledge about Immune reactions, response etc.
- To provide brief knowledge of parasites involved in human infections**.**
- To understand the life cycle and lab diagnosis of various important human parasites**.**

B.Sc. in Medical Laboratory Technology III YEAR
HISTOPATHALOGY AND CYTOLOGY TECHNIQUES MLT 301

Course Outcome:

- To provide knowledge about Histopathology
- To provide knowledge of slide preparation and staining of various cytological specimen**.**
- To train students in testing of various histological specimen in addition to microtomy**.**

COAGULATION STUDIES
MLT 302

Course Outcome:

- To provide brief introduction of coagulation system and factors involved in coagulation**.**
- To provide knowledge about diagnosis of coagulation factors deficiencies**.**

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SYSTEMIC BACTERIOLGY,MYCOLOGY AND VIROLOGY
MLT 303

Course Outcome:

- To provide information about the different type of bacterial culture procedures and test used for identification of medically important bacteria**.**
- To identify the indications for basic procedures, culture media and their preparations.
- To provide brief introduction of general characteristics of medically important fungi**.**
- To provide laboratory diagnosis of various medically important fungi**.** • To provide complete procedural investigation procedures of fungi causing human diseases
- To impart basic knowledge of disease causing viruses**.**
- To provide brief introduction of diagnostics procedures of disease causing viruses**.**

QUALITY LABORATORY MANAGEMENT AND AUTOMATION

MLT 304

Course Outcome:

- To demonstrate distinctive, meritorious and high quality practice that leads to excellence**.**
- To demonstrate the quality of being assumable for all actions to service users**.**