Add-on in Medical Lab Technician

Program Outcome:

Add-on in Medical Lab Technician is a value added program designed to ensure that students are well prepared to enter the profession at the entry level, and continue learning throughout their careers. The course bridges the gap between the pure life sciences and medical sciences. The students will be able to perform basic laboratory techniques on biological specimens and recognize factors that affect laboratory procedures and results.

Program specific outcome

- A person with Certificate/Diploma in MLT can easily fit in hospitals/ clinics/ nursing homes/ diagnostic labs as a technician.
- They may also go for PG Diploma as well as PG Certificate courses related to the field of MLT such as cytotechnology, immunology, microbiology, immunohematology, phlebotomy, histotechnology and forensic science.

Course outcome

Certificate level

CO- I: Students will gain knowledge about the various functional components of a laboratory, the basic needs of clinical lab, safety regulations and first aid procedures. The students also will be well versed with reagent preparation, calibrations of glass wares, laboratory calculations, quality control of laboratory findings and methods of specimen collection.

CO-II: Students will have an understanding on the structural organization of human body, structure and functioning of various systems such as digestive, respiratory, cardiovascular, excretory and lymphatic system.

CO-III: Students will understand the function and structural characteristics of biomolecules and comprehend their metabolism, gain knowledge about the normal and abnormal process of the body, biochemical changes in the body under pathological conditions and learn various biochemical techniques used for analyzing the samples.

CO-IV: Students will have knowledge of types of culture media, its preparation and preservation, sterilization methods and staining techniques.

CO-V: Students will gain knowledge about the various components of blood and their function, types and causes of anaemia.

CO-VI: Students will gain knowledge about the physical, chemical and microscopic analysis of various pathological samples such as urine, sputum and stool.

Practicals

Students will be able to calibrate the glass wares and minor equipments, collect blood sample, prepare serum and plasma, perform routine biochemical tests such as CBC, GTT, serum protein, blood urea, creatine, creatinine, bilirubin, cholesterol, uric acid, TAG determination, prepare culture media, sterilize, isolate bacteria from various source and identify through staining techniques, identify abnormal cells in blood smear, perform physical, chemical and microscopic examination of urine, stool and sputum samples.

References

1. Manual for Routine Diagnostic Tests-Vol I, II, III by Kanai. L. Mukherjee
2. Clinical Biochemistry by Varley
3. Handbook of Medical Laboratory Technology by V.H. Talib
4. Practical and Clinical Biochemistry by T.N Pattabhiraman
5. Biochemistry; Voet.D and Voet.J.G
6. Principles of Biochemistry, Lehninger et al.,
7. Principles of Biochemistry, Smith et al.,
8. Text Book of Biochemistry with Clinical correlations; Thomas Devlin
9. The Cell, Cooper, Geoffrey.M
10. Biology of Microorganisms, Brock
11. Microbes in action, A Laboratory Manual of Microbiology Seley et al.,
12. Microbiology, Pelczer, Reid and Krieg
13. Microbiology, Prescot, Hartley and Klein
14. Human Physiology; Stuart Era Fox
15. Review of Medical Physiology, Gannong.W.F
16. Enzyme Kinetics;Irwin H Segel
17. Understanding Enzymes;Palmer
18. Practical Biochemistry; Principles and Techniques; K Wilson and J Walker

MAHARANI LAKSHMI AMMANNI COLLEGE FOR WOMEN

SCIENCE P.O. MALLESWARAM, BANGALORE -12

SYLLABUS

For the UGC sponsored Add on

MEDICAL LAB TECHNICIAN COURSE

Certificate in Medical Lab Technician Course

UGC sponsored Add on course

SYLLABUS

Prerequisite: PUC (PCMB) **Total Hours: 160**

(Theory: 85 Hrs & Practicals: 75 Hrs)

Module	Title of the paper	Theory Hrs	Practical Hrs	Total Hrs
I	Lab Management	15	15	30
II	Physiology- I	15	-	15
III	General Biochemistry	15	10	25
IV	Medical Microbiology-I	15	15	30
V	Haematology-I	10	15	25
VI	Clinical Pathology-I	15	20	35

Module I

Lab Management

Medical care in India
Functional components and basic needs of clinical laboratory
Safety regulations, first aid and clinical laboratory record
Methods of specimen collection
Calibration of glasswares and equipments.
Preparation of lab reagents
Units of measurements and laboratory calculations
Quality control of laboratory findings

Module II

Physiology-I

Introduction to Physiology
An overview of the structural organization of
Cells and tissues
Digestive system
Respiratory system
Cardiovascular system
Lymphatic system and
Excretory system

Module III

General Biochemistry

Chemistry of water
Introduction to biomolecules – Definition, classification, function and structural characteristics of carbohydrates, proteins, lipids, nucleic acid, vitamins and minerals
An outline of central metabolic pathways.
Acquired and Inborn errors of metabolism-Diabetes mellitus
Instrumentation technique in biochemical analysis – colorimeter, spectrophotometer, centrifuge and chromatography techniques.
Normal and abnormal processes of the body
Biochemical changes in the body under pathological conditions
Basic clinical biochemistry-Diagnostic biochemical profiles

Module IV

Medical microbiology-I

Microscopy- Types and construction of microscopes
Culture media- types of culture media, preparation and preservation of culture media.
Sterilization- Physical and chemical methods of sterilization.
Bacteriology- Structure, classification, isolation and identification of bacteria.
Staining techniques-Gram staining, endospore staining and acid fast staining
Bacteriological diagnosis of syphilis and clostridia.

Module V

Haematology-I

Introduction to Haematology-Components of blood and their functions
Haematopoietic system of body
Abnormal cells in peripheral blood smear
Anaemias-Definition, classification, Morphologic types of anemia. Iron deficiency anemia, Megaloblastic anemia, Hemolytic anemia and pernicious anemia.

Module VI

Clinical Pathology-I

Urine- Composition-Normal and abnormal constituents, collection and preservation of specimen.
Analysis-Physical, Chemical and microscopic examination
Evaluation of renal function.
Sputum Analysis-Physical, chemical and microscopic examination.
Stool analysis- Physical appearance and composition,
Analysis-Physical, chemical and microscopic examination

Practical-I

Calibration of common glasswares and equipments.
Introduction to basic techniques of lab operation.
Preparation of lab reagents
Methods of specimen collection
Determination of blood glucose, TAG, cholesterol, total protein

Routine biochemical tests- GTT, serum protein, blood urea, Creatine, creatinine, bilirubin, cholesterol, uric acid.
Culture media- preparation and preservation of culture media.
Sterilization- Physical and chemical methods of sterilization.
Bacteriology- isolation of bacteria from various sources and identification of bacteria.
Staining techniques
Bacteriological diagnosis of syphilis and clostridia.
Qualitative tests for carbohydrates, proteins, amino acids, lipids and urea.
Hematological Tests- Specimen collection, Estimation of Hb concentration, Total RBC count. Determination of Haematocrit, Enumeration of formed elements, Packed cell volume and Absolute indices, Erythrocyte sedimentation rate, Reticulocyte count, Eosinophil count, Platelet count.
Study of blood smear for differential count and cell morphology. Abnormal cells in peripheral blood smear
Urine- Composition, collection and preservation. Collection of 24hr urine sample.
Urine Analysis-Physical, Chemical and microscopic examination
Sputum Analysis-Physical and microscopic examination.
Stool analysis-Appearance and composition,
Analysis by Physical, chemical and microscopic examination.