

CERTIFICATE COURSE IN CLINICAL LABORATORY TECHNOLOGY

THEORY

Unit I : Anatomy

Anatomical structure and location/distribution of different part of human body with anatomical terms and planes.

- Gastro intestinal tract.
- Salivary glands, stomach, intestine.
- Liver, Gall bladder, spleen, pancreas
- Respiratory system
- Kidneys, Urater, Bladder.
- Testes (male genital organ)
- Ovaries, Uterus, Vagina, Urethra

Unit II: Physiology

- Blood composition and function.
- Normal counts of blood cells and their function.
- Steps of coagulation, anticoagulants
- CSF
- Blood grouping, ABO and Rh typing.

Cardiovascular system.

- Heart structure and function.
- Blood vessels.
- Circulation
- Pulse, Blood pressure, Electrocardiogram.

Respiratory system.:

- Organs of Respiration.
- Transport of O₂ and CO₂ in the blood.

Excretory System:

- Functions of Kidneys.
- Functions of Glomerular tubules.
- Composition of normal and abnormal urine.

Digestive System :

- Function of stomach, saliva, gastric juice, pancreatic juice.

Endocrine Glands :

- Defination of endocrine glands, name and Hormones secreted.
- Action of hormones.

Reproductive System

- Sex organs, male and female
- Testes and ovaries.
- Contraceptives.

Unit III : Elementry Clinical Biochemistry

- Elementry knowledge, handling, maintance, and care of analytical instruments.
 - a) Centrifuge
 - b) Balance
 - c) Colorimeter.
 - d) Definaton, classification and examples of carbohydrates, proteins, and lipids.

Unit IV : Microbiology

1. Introduction to Microbiology, Morphological classfication of Bacteira.

2. Cultivation of bacteria aerobic and anaerobic.
3. Culture media, types of media, special media.
4. Sterilization and Disinfection (Physical and Chemical methods)
5. Morphology and Pathogenicity of Staphylococci, Streptococci, Salmonella, Shigella and Vibrio.
6. Morphology, Pathogenicity and methods of isolation of Mycobacterium tuberculosis and Mycobacterium leprae.
7. Antimicrobial susceptibility test.
8. Preservation of stock cultures.

Unit V : Haematology and clinical pathology.

1. Introduction to Haematology.
2. Collection of blood - ways of collection.
3. Anticoagulants.
4. Red cell count - Haemocytometry.
5. White cell count – TLC
6. Differential white cell count. (DLC)
7. Absolute Eosinophil count.
8. ESR
9. Haematocrit - Packed cell volume (PCV)
10. Haemoglobin estimation.
11. Red cell Indices MCV, MCH, MCHC.
12. Reticulocyte count.
13. Sickel cell preparation.
14. Osmotic Fragility test.
15. Preparation of Bone Marrow.
16. Morphology of Normal and Abnormal cells.
17. Coagulation test.
18. Bleeding time, clotting time.
19. Urine analysis (Normal constituents, Physical examination, chemical examination & Microscopic examination.)
20. Stool Examination (Normal and Abnormal constituents.)
21. C.S.F. Examination (Normal and Abnormal Cell counts and different counts.)
22. Semen Analysis : (Physical examination, Mortality and Morphology)
23. Blood grouping and Blood Banking.

PRACTICALS

- Anatomy :
1. Study of permanent slides of cells and tissues.
 2. Surface marking of body.
 3. Skeletal system, bones and joints.

- Physiology:
1. Microscope, usage, maintenance, cleaning and minor repair.
 2. Osmotic fragility test.
 3. Identification of RBC under microscope.
 4. DLC, Platelets, Reticulocytes.
 5. To obtain sample of plasma and serum.
 6. Preparation of oxalate, citrate, fluoride and EDTA anti coagulant Bulbs.
 7. Haematocrit (PCV)
 8. Neubour's chamber, pipettes (RBC/WBC), western green pipettes.
 9. Haemoglobin estimation (By Sahli's method)
 10. Blood pressure and pulse.

11. Examination of urine glucose and protein.
12. Record/Report writing.

Clinical Biochemistry :

1. Cleaning of Glassware.
2. Maintenance of laboratory instruments and cleaning.
 - i. Centrifuge.
 - ii. Colorimeter.
 - iii. Spectrophotometer.
 - iv. Microscope.
3. Estimation of serum Bilirubin, Blood Sugar, Blood Urea, Serum Creatinine, Uric acid, Cholesterol. Serum Acid phosphatase, Alkaline phosphatase, SGOT, SGPT, Serum Sodium/Potassium.
4. Qualitative and Quantitative estimation of urine sugar and protein.
5. C.S.F. protein, and sugar.

Microbiology

1. Gram staining technique.
2. Acid fast staining (Z-N)
3. Motility by hanging drop method.
4. Cultivation of UTI isolates.
5. Culture and sensitivity test (Kirby-Bauer method)
6. Biochemical test (Glucose, Lactose, Mannitol, Indole, MR, V.P.Citrate)

Haematology and Clinical Pathology.

1. Haemoglobin estimation by Sahli's method.
2. R.B.C. count.
3. TLC
4. DLC
5. Platelet count
6. Reticulocyte count.
7. Bleeding time, clotting time.
8. Examination of blood smear (Peripheral smear)
9. Eosinophil count: LE cell test, E.S.R. sickel cell test.
10. Stool examination for ova, cyst, Amoeba, Exudate, fat globule.
11. Routine Urine analysis.
12. Sputum Analysis.
13. Semen Analysis.
14. C.S.F. examination.
15. Bone Marrow smear Preparation.
16. Blood group: ABO and Rhfactor.

Field work / Project work : Project work / field work involving 90 hrs. minimum laboratory work and based on critical study of any one of the topics included in theory or practical should be completed for Certificate course. Project report of above 30 pages be submitted.