Curriculum Semester 5th
B.Sc. MLT

Environmental sciences
CE-206

The curriculum is to be included by university as this course is common to other subjects like biotechnology

PARASITOLOGY AND VIROLOGY
BMT-301

1. Introduction to Medical Parasitology
2. General characteristics of protozoa and helminthes
3. Collection, Transport, processing and preservation of samples for routine parasitological investigations
4. Morphology, life cycle and lab-diagnosis of Giardia and Entamoeba
5. Morphology, life cycle and lab-diagnosis of Roundworms and Hookworms
6. Morphology, life cycle and lab-diagnosis of T. solium and T. saginata
7. Morphology, life cycle and lab-diagnosis of Malarial parasite with special reference to P.vivax and P.falciparum
8. Laboratory diagnosis of hydrated cyst and cysti-cercosis
9. Concentration techniques for demonstration of Ova (Principles and applications)
10. Introduction to medical virology
11. Classification of viruses.
12. Classification of medically important viruses (Rabies, Polio, HIV, Influenza)
13. Collection, transportation and storage of sample for viral diagnosis
14. Staining techniques used in Virology
15. Processing of samples for viral diagnosis (Egg inoculation and tissue culture)
16. Laboratory diagnosis of important viral infections i.e. influenza, H1N1, Hepatitis (A, B and C) and HIV
17. Brief knowledge about rapid diagnostic techniques in virology

PARASITOLOGY AND VIROLOGY
BMT-311

1. Routine stool examination for detection of intestinal parasites with concentration methods:
    - Saline preparation
    - Iodine preparation
    - Floatation method
    - Centrifugation method
    - Formal ether method
    - Zinc sulphate method
2. Identification of adult worms from models/slides:
    - Tapeworm
    - Tapeworm segments
    - Ascaris
    - Hookworms
    - Pinworms
3. Malarial parasite:
    - Preparation of thin and thick smears

- Staining of smears
- Examination of smears for malarial parasites (P.Vivax and P.falciparum)
- Demonstration of various stages of life cycle of malarial parasites from stained slides

Applied Haematology III and Blood Banking BMT-303

Part –A

1. Various radioactive isotopes used in haematology
    a) Definition, source, half life and their application
    b) Units of measurement used in Relation to Radiation i.e Curie, millicurie and microcurie
    c) What is Rad?
2. Radiation hazards and its prevention
3. Disposal of radioactive material
4. Automation in hematology
    1. Blood cell counter
    2. Coaglumeter
5. Quality control in hematology
6. Automation in hematology

1. Blood cell counter
2. Coaglumeter

Part-B

1. History and discovery of various blood group systems
2. ABO and Rh blood group system
3. Sources of error in blood grouping and their elimination.
4. Compatibility test in blood transfusion
    a) Major cross matching
    b) Minor cross matching
5. Complications and hazards of blood transfusion
6. Laboratory investigations of transfusion reactions and mismatched blood transfusion including direct and indirect Comb's tests.
7. Preparation of various fractions of blood for transfusion and therapeutic purposes such as:
    a) Packed red cells, washed red cells and FROZEN Red cells
    b) Platelet Rich Plasma (PRP), Platelet concentrate and Frozen platelets.
    c) Fresh plasma(PPP), Fresh Frozen Plasma(FFP) and cryoprecipitate
8. Haempheresis - pertaining to Leucocytes, platelets and plasma.
9. Quality control in blood bank

Applied Haematology III and Blood Banking BMT-313

1. To prepare Acid Citrate Dextrose (ACD) and Citrate Phosphate Dextrose (CPD) Solutions
2. Screening of blood donor: physical examination including medical history of the donor
3. Collection and preservation of blood for transfusion purpose

4. Screening of blood for Malaria, Microfilaria, syphilis, HBsAg, HCV and HIV
5. To determine the ABO & Rh grouping
    a) Direct or preliminary grouping
    b) Indirect or proof grouping
    c) Rh grouping and determination of Du in case of Rh negative
6. To perform Direct and Indirect Coomb's test
7. To perform cross matching
    a) Major cross matching
    b) Minor cross matching
8. Preparation of various fractions of blood.

HISTOTECHNOLOGY – 2 & Cytology
BMT 305

1. Cryostat sectioning, its application in diagnostic histopathology.
2. Specific Staining Procedures for detection of:

a) Connective Tissue elements, Trichrome staining, special stains for fat, muscle-fibres, elastic, raticulin fibers and collagen fibers etc.
b) Metacromatic staining for rapid diagnosis such as toludine blue O on frozen section.
c) Principles of metal impregnation techniques.
d) Demonstration and identification of minerals and pigments, removal of pigments / artifacts in tissue sections.

3. Demonstration of proteins & nucleic acids.
4. Demonstration of carbohydrates, lipids, fat & fat like substances.
5. Demonstration of micro-organisms, fungi in tissue section.
6. Tissue requiring special treatment i.e. eye ball, bone marrow, muscle biopsy, under-calcified or un-calcified bones, whole brain, whole lungs including Other large organs.
7. Enzyme histochemistry : Diagnostic applications & demonstration of phosphatases, dehydrogenases, oxidases & peroxidases.
8. Vital staining.
9. Neuropathological techniques & other demonstration.
10. Museum techniques..
11. Aspiration cytology principles, indications & utility of the technique with special emphasis on role of cytotechnician in FNAC clinics.
12. Exfoliate cytology (Papanicolaou technique for the staining of cervical smears.)
13. Infection & immune system.
14 Cancer immunology.
15. Tissue typing for kidney transplant.

HISTOTECHNOLOGY – 2 & Cytology
BMT 315

1. To cut frozen section and stain for haematoxylin and eosin, metachromatic stain toluidine blue-‘o’ and oil red ‘o’ staining for the demonstration of fat
2. To prepare schiff’s reagent in the lab and do Periodic Acid schiff’s (PAS) stain on a paraffin section
3. To prepare ammonical silver bath in the laboratory and stain paraffin embedded section for the demonstration of reticulin fibers.
4. To stain a paraffin section for the demonstration of smooth muscle Van gieson’s stain
5. To perform Masson’s trichrome stain on a paraffin section for the demonstration of collagen, muscle fibre and other cell elements.
6. To stain the paraffin section for the demonstration of elastic fibres (EVG).
7. To stain Decalcified paraffin embedded section for the presence of calcium salts (Von Kossa’s method).
8. To stain a paraffin section for the following muci-carmin, alsian blue.
9. To stain a paraffin section for the demonstration of iron (perl’s stain)
10. To demonstrate the presence of micro organism and fungi in paraffin embedded sections the following staining procedures:
    a) Gram’s staining
    b) AFB staining (acid fast bacilli Ziehl neelsen’s staining)
    c) Grocott’s stain for fungi
    d) Schmorl’s reaction for reducing substances (melanin)
11. To stain for nucleic acids (DNA and RNA)
12. To perform Papnicolaou’s stain on cervical smear
13. To perform Guard’s staining for demonstration of sex chromatin (barr bodies on a buccal smear)

CLINICAL BIOCHEMISTRY--II
BMT-307

1. Automation in clinical Biochemistry Laboratory
2. Method of estimation and assessment for:
   a. Glucose tolerance test.
   b. Insulin tolerance test.
   c. Xylose excretion test.
3. Gastric analysis .
4. Clearance test for renal function.
5. Qualitative test for urobilinogens, Barbiturates, Protein Bound Iodine, 17 Ketosteroids.
6. Method of estimation, Principles of assay, normal and abnormals in tissues of acid phosphatase, Alkaline phosphatase, lactate dehydrogenase, aspartate transaminase,alanine transaminase, Creatine phosphokinase.
7. Qualitative analysis of renal calculi.
8. Chemical examination of cerebrospinal fluid.
9. Brief knowledge about rapid techniques in Clinical Biochemistry

CLINICAL BIOCHEMISTRY--II
BMT-317

1. Estimation of Glucouse tolerance test (GTT).
2. Estimation of Insuline tolerance test (ITT).
3. Determination of Uric acid in Urine.
4. Determination of creatinine clearance .
5. Determination of Urea clearance.
6. Determination of Serum acid phosphotase.
7. Determination of Serum Alkaline phosphatase.
8. Determination of Serum Lactate dehydrogenase.