

## **COURSES OFFERED BY THE DEPARTMENT OF MEDICAL LABORATORY SCIENCE**

### **THIRD YEAR FIRST SEMESTER**

#### **ML 3101 Specimen Collection Externship and Manual (Credits-01)**

Basic and specific laboratory procedures adopted to collect specimens in the fields of Haematology, Clinical Biochemistry, Microbiology and Cytology  
Externship book-60% Manual-40%

#### **ML 3102 Work Based Learning (Haematotechnology I) (Credits-03)**

Preparation of glassware for haematology, measurements of haemoglobin, PCV, red cell count, white cell count and differential counts, blood film preparation and staining (Leishman staining), ESR, platelet count, bleeding time, clotting time, APTT and prothrombin time, reticulocyte count (new methylene blue), full blood count, blood pictures (anaemia, thalassaemia, leukaemia).

Attendance+ student log book-05% Theory-50% Practical-45%

#### **ML 3103 Work Based Learning (Histotechnology I) (Credits-03)**

Collecting procedure, collecting containers, tissue accession, labeling / request forms, tissue logging, preparation of fixatives for histological work, preparation of tissue specimens for processing, decalcification and assessment, dehydration procedures (manual and automatic), clearing, wax impregnation and embedding, trimming, cutting and mounting, theory of different types of staining mechanism, H&E staining of tissue slides, examination of H&E stained slides.

Attendance+ student log book-10% Theory-45% Practical-45%

#### **ML 3104 Work Based Learning (Clinical Biochemistry I) (Credits-03)**

Specimen collection and transport, specimen processing and manual analytical techniques, urine full report, urine ketone bodies, bile etc., urine specific gravity, seminal fluid analysis, body fluid analysis, blood glucose (FBS, PPBS, OGTT), blood urea, BUN, serum creatinine, serum bilirubin, serum proteins, serum electrolytes.

Attendance+ student log book-05% Theory-50% Practical-45%

#### **ML 3105 Work Based Learning (Microbiology I) (Credits-03)**

Specimen collection and transport, processing of specimens, culture of urine, blood, sputum, swabs, CSF, body fluids, stools, tissue culture, virus culture, fungal cultures, gram stains, methylene blue /ZN stain, negative stain and identification of capsules. preparation of stains / reagents / preparation of culture media, sterilisation and disposal of cultures (autoclave), hanging drop and motility testing, identification of bacteria including biochemical tests such as oxidative tests, coagulase test, catalase test and other tests used for this purpose, laboratory safety

measures (GLP), quality control of stains, media and reagents used for testing, accreditation of laboratories.

Attendance + Student log book-20%practicals-50%Assignments-30%

**ML 3106 Work Based Learning (Blood Bank Serology) (Credits-02)**

Blood grouping, cross matching, Coomb's tests - direct and indirect, preparation of blood components /products, antibody screening, antibody inspection, genotyping, Rh antibody titres, cold antibody titres, rare blood groups, problems in grouping and cross matching, HLA typing.

Attendance+ student log book-05% Theory-60% Practical-35%

**ML 3107Work Based Learning (Night Laboratory) (Credits-01)**

Urgent diagnostic tests performed in emergencies, reporting of night laboratory test results

Attendance+ student log book-05% Theory-20% Practical-75%

**ML 3108 Work Based Learning(Sexually Transmitted Diseases) (Credits-01)**

Laboratory diagnosis of HIV infection (strip test, ELISA, particle agglutination test), syphilis (VDRL, TPPA, TPHA), gonorrhoea (direct smear- gram stain, culture, ABST), chancroid (direct smear – gram stain), vaginitis (trichomoniasis – direct microscopy, candidiasis – direct microscopy/ 10% KOH preparation/ gram stain/ culture, bacterial vaginosis – wet mount / gram stain)

Attendance + Student log book-20%Practical-80%

### **THIRD YEAR SECOND SEMESTER**

**ML 3201 Work Based Learning (Haematotechnology II) (Credits-04)**

Special haematological investigations, investigation of haemolytic anaemia, osmotic fragility test, special coagulation tests, factor assay and correlation test, bone marrow-slide preparation and staining, examination of marrow specimens, Hb electrophoresis, preparation of Hb standards, preparation of stains/ reagents, alkaline denaturation test, glycosylated Hb tests, special staining techniques such as pearl staining, solubility test, sickling test.

Attendance + Student log book- 10%Theory-35%Practical-45%

Case study presentation-10%

**ML 3202 Work Based Learning (Histotechnology II) (Credit-04)**

Preparation of special stains, special staining techniques, frozen sections, cryostat sections, immunohistochemistry, enzyme histochemistry, transport of fresh and other special type of specimens, special care in handling chemicals used in histotechnology, identification of histotechnological errors in prepared slides, automation in the histology laboratory, quality assurance in Histotechnology.

Attendance + Student log book- 20%Theory-40% Practical-40%

**ML 3203 Work Based Learning (Clinical Biochemistry II) (Credits- 03)**

Use of automated biochemistry analysers, specimen collection and processing for special biochemical tests and special urine tests, SGOT/SGPT, serum amylase, alkaline phosphatase etc., CSF full report, CSF proteins and sugar, serum lipids, cholesterol, lipid profile, aspiration fluid full report, sugar and proteins, preparation of reagents, standards, QC samples, serum protein electrophoresis, serum uric acid, creatinine clearance, preparation of 24 hour urine bottles, urine micro albumin.

Attendance + Student log book- 10% Theory-40% Practical-40%  
Case study presentation-10%

**ML 3204 Work Based Learning (Microbiology II) (Credits-02)**

Skills training in a healthcare associated diagnostic microbiology laboratory to include isolation and identification of micro-organisms, quality control in a diagnostic microbiology laboratory, antibiotic sensitivity testing, serology in a diagnostic microbiology laboratory.

Attendance + Student log book- 10% Procedure manual-20% Theory-30% Practical - 40% Case study presentation-10%

**ML 3205 Work Based Learning (Medical Parasitology & Entomology) (Credits- 01)**

Preparation and examination of wet faecal smears (saline and iodine) for protozoans and helminthic infections, preparation and staining (Leishman /Giemsa stain) of blood smears and identification of malaria parasites, blood film staining, examination and identification of filarial parasites, rapid diagnostic tests, immunological tests such as FAT, ova identification-concentration techniques, worm identification, preparation, staining and identification of *Leishmania* and *Toxoplasma*, *Trichomonas*, tape worm segments and eggs, preparation of stains, mosquito larva and adult identification, other important arthropod vectors; flies, ticks, mites, fleas, lice etc.

Attendance + Student log book- 20% Theory-40% Practical -40%

**ML 3206 Scientific Writing and Presentations (Credits-01)**

Introduction to scientific writing, Guidelines for writing – title and abstract, Ethics, Literature survey, Introduction, experimental/ Methods and Material selection, Results, discussion, Conclusions, References, Structure and Layout of a Thesis/ Project Report, Students are supposed to retrieve literature on given scientific topic and self selected 2 topics approved by the department and collate the information into a hand written script not less than 5 pages with the given format. They are required to prepare teacher guided power point presentations on each topic and make the presentations in front of peers and teachers. Each student is expected to question their peers on rotation basis during the discussion period

Assignments- 30% Presentations-30% End of Semester (Theory/ Essay)-40%

**ML 3207 Work Based Learning (Immunotechnology and Hormone assays) (Credits - 02)**

Agglutination test, immuno-histochemical tests, antibody titres, immunofluorescence, RIA, ELISA, immunoelectrophoresis, flowcytometry, flocculation test, precipitation tests, nephelometry, strip tests.

Attendance + Student log book- 20% Theory-40% Practical-40%

**ML 3208 Work Based Learning (Cytotechnology and Laboratory Management) (Credits-01)**

Calculate monthly work load using specimen registers, calculate and prepare annual indent, reception and storage of hazardous and non-hazardous laboratory chemicals, maintain major laboratory equipment, make local purchasing according to financial regulations, documentation of local purchases, identify major and minor supplies for effective laboratory work, repair and remove unserviceable equipment, maintain laboratory inventory registers, document the laboratory plan/ develop emergency procedures, preparation of fixative for cytological work, FNA cytology staining & examination, PAP smear staining & screening, preparation of stains

Attendance + Student log book- 20% Theory-40% Practical-40%