HML - MEDICAL LAB SCIENCE (HML)

HML 2013 Clinical Hematology I (2-3-3)
Students are introduced to the work carried out in a haematology laboratory with emphasis on the importance of correct documentation, sample collection and quality of results. The normal haemopoietic red cell production, including the synthesis and function of haemoglobin will be discussed along with the use of blood cell counters and data interpretation. Students learn to recognize normal and abnormal red cells and describe the cause and effects of various types of anaemia.
Prerequisites: HSC 1033, HSC 1123

HML 2033 Medical Microbiology (2-3-3)
The course introduces theoretical concepts and practical techniques used in the classification, isolation and identification of microorganisms, concepts of infection, transmission of disease, pathogenicity, body defense mechanisms, prevention and control of infections. Students learn techniques used in diagnosis of bacterial infections, safe working practices and the need for quality control are an integral part of the course. Through laboratory practical exercises and observation the role of the medical technologists in the managment of infectious diseases is delineated.
Prerequisites: HSC 1033, HSC 1123

HML 2043 Clinical Chemistry I (2-3-3)
Learning the foundations for the theory and practical aspects of Clincial Chemistry is important to build on for the subsequent Clinical Chemistry II course. Identification of laboratory safety, mathematics, quality assurance and analytical principles of basic clinical chemistry procedures are covered. At a novice level and introduction to normal physiology and common pathologies are discussed and analysed. Theoretical learning is applied through manual techniques during laboratory exercises, applying principles to the analysis of the chemical constituents of blood and other body fluids.
Prerequisites: (HSC 1123, HSC 1033, HSC 1023) or HML 1302

HML 2053 Immunology (2-3-3)
In this course students will study how the immune system defends the body against attack by microorganisms and parasites, how it discriminates between self and nonself, how it deals with foreign molecues, and how it recognises and deals with neoplastic and virally transformed cells as well as transplanted organs, cells and proteins. Immunological procedures will be introduced as the basis of many hematological, microbiological, biochemical and histopathological tests.
Prerequisites: HSC 1033

HML 2113 Systematic Bacteriology (2-3-3)
Further identification and clinical correlations of bacteria encountered in clinical specimens follows on from Medical Microbiology; performing procedures and interpretation of microscopic, cultural, biochemical and serological techniques used in the isolation and identification of bacteria commonly enountered in the medical microbiology lab. There is continued instruction in the dangers of handling biohazardous clinical specimens and how to perform all tasks safely, following aseptic procedures. Performance and interpretation of antimicrobial susceptibility tests are also covered.
Prerequisites: HML 2033

HML 2143 Clinical Hematology II (2-3-3)
Begins with instruction on the detection, diagnosis and lab investigation of the hemoglobinopathiies and the importance of sickle cell disease and thalassaemia in the UAE. This is followed by a study of normal and abnormal WBC formation and is reinforced by viewing peripheral blood films and patient case studies. Subjects explored include lab diagnosis of systemic and infectious diseases and many haematological malignancies. The diagnositic applications of cell marker anaysis, flow cytometry, HLA system and stem cell transplantation will also be discussed.
Prerequisites: HML 2013

HML 2153 Histotechnology (2-3-3)
This course introduces the principles and practices of Anatomic pathology used in the investigation of disease and its processes, immunohistochemistry and quality assurance systems. Instruction concentrates on safe and good laboratory practices. The course introduces cell injury, tissue preservation, tissue processing, microtomy, tissue recognition and preparation of tissue samples for diagnosis. Through laboratory practical's, the role of histochemist in differentiating cellular diseases is clarified. Emphasis is placed on trouble-shooting methods and advanced techniques in tissue diagnosis.
Prerequisites: HSC 1033, HSC 1123

HML 2203 Clinical Chemistry II (2-3-3)
Performing a range of manual techniques for clinical chemistry laboratory analysis in addition to introducing automated chemistry analysers to enhance the crucial skills sets required for working in a medical laboratory environment. Students describe and apply the principles of enzymology along with measurement techniques. Students comprehend normal physiology and pathology related to each of the analytes for liver function tests, cardiac enzymes, acid-base balance and hCG.
Prerequisites: HML 2043

HML 2213 Clinical Preceptorship I (0-36-3)
Students under the supervision of professional medical laboratory technologists observe and perform routine and specialized medical laboratory procedures, and analysis of laboratory data. Competence levels in medical laboratory procedures are set at the appropriate standard for third year students and teaching, assessment, and evaluation are reflective of the indicated standard.
Prerequisites: HML 2143, HML 2203, HML 2113, HML 2153

HML 3003 Hemostasis (2-3-3)
This course covers normal hemostasis and the roles and interactions of the blood vessels and platelets, as well as the coagulation and fibrinolytic systems. The inherited and acquired disorders of hemostasis will be explored and students will carry out the practical tasks needed to differentiate and diagnose these disorders. The causes and clinical effects of thrombosis will be discussed and students will carry out the appropriate laboratory tests involved in the diagnosis and treatment of these disorders.
Prerequisites: HML 2143

HML 3013 Parasitology, Virology, Mycology (2-3-3)
Further identification and clinical correlations of bacteria encountered in clinical specimens follows on from Microbiology II course, mainly blood and body fluids. In addition, the course includes the study of parasitic,viral, fungal infections and their diagnosis. The student assesses and performs, as appropriate, the specimen collection and processing, microscopic, cultural and immunological techniques used in the isolation and identification of fungi and parasites
Prerequisites: HML 2113

HML 3023 Cytotechnology (2-3-3)
Introduces principles of cytopathology to investigate disease processes and safe working practices. Review population screening, collection and preparation of samples, staining cells for diagnosis and recognition. Through practicals, the role of the technologist and histochemistry in differentiating cellular diseases will be understood. Emphasis is placed on trouble-shooting, advanced techniques used in tissue diagnosis, immunohistochemistry and QA systems.
Prerequisites: HML 2153

HML 3033 Clinical Biochemistry (2-3-3)
Advanced topics include lipid metabolism and its relationship to cardiovascular disease; prostate disease; mineral metabolism; thyroid function; introduction to therapeutic drug monitoring; immunoassay methods, and Ion Selective Electrodes. Students examine the inter-relationships of disease and clinical chemistry values along with related analytical techniques. Laboratory exercises complement the concepts covered in the classroom.
Prerequisites: HML 2203

HML 3043 Transfusion Medicine (2-3-3)
Explore antigen-antibody reactions, inheritance and structure of blood group antigens. Reinforce by performing grouping techniques. Donation, screening and processing blood conponents, as well as testing donors and recipients to ensure safe transfusion are explored. QC and QA are explained to ensure safety of blood products. Learn crossmatching and the detection and identification clinically significant antibodies and possible adverse effects of transfusion and methods to investigate reactions. Study HDNB and how to detect and prevent this condition.
Prerequisites: HSC 1033, HML 2053, HML 3003

HML 3053 Laboratory Management (3-1-3)
Introduce students to the concepts of management in the hospital laboratory, and develop skills essential to quality management: individual performance; collective performance within unit of responsibility; and external stakeholders. Students recognize the requirements for good management, organizational excellence and monitoring to benchmark standards. The course will require students to participate in group work (management teams) and will involve problem-solving and role-playing.
Prerequisites: HML 3003, HML 3013, HML 3033

HML 3103 Applications in Molecular Diagnostics (2-2-3)
Introduces a variety of current techniques in molecular biology, with a focus on analysis of nucleic acids: Polymerase chain reaction, gel electrophoresis and blotting techniques, real-time PCR, microarrays, recombinant DNA technology, DNA sequencing and gene function analysis. Manipulation and analysis of gene expression in prokaryotic and eukaryotic systems will be briefly described. Students will become familiar with mechanisms, objectives, applicability and limitations of common wet-lab methods.
Prerequisites: HML 2053

HML 4006 Clinical Preceptorship II (0-24-6)
Students under the supervision of professional medical laboratory technologists observe and perform routine and specialised medical laboratory procedures, and analysis of laboratory data. Competence levels in medical laboratory procedures are set at the appropriate standard for third year students and teaching, assessment, and evaluation are reflective of the indicated standard.
Prerequisites: HML 3043, HML 3033, HML 3013, HML 3003, HML 3023

HML 4016 Clinical Correlations (6-2-6)
Designed to enhance problem solving skills by integrating the various streams of knowledge acquired in Microbiology, Hematology, Clinical Chemistry, Transfusion Science, Immunology and Molecular diagnostics in the context of clinical case studies of patients. Emphasis is on the correlation of the lab data with pathophysiology, diagnosis and treatment of major disease categories. Competencies to be reinforced include leadership, critical thinking, communication, analytical skills, ethical issues, professionalism and the skills to work in a healthcare setting.
Prerequisites: HML 3003, HML 3013, HML 3023, HML 3033, HML 3043

HML 4116 Clinical Preceptorship III (0-24-6)
Students under the supervision of professional medical laboratory technologists observe and perform routine and specialised medical laboratory procedures, and analysis of laboratory data. Competence levels in medical laboratory procedures are set at the appropriate standard for third year students and teaching, assessment, and evaluation are reflective of the indicated standard.
Prerequisites: HML 4006

HML 4123 Pathology of Diseases (3-1-3)
Introduces the biological principles of human disease and the transition from health to disease. Synthesizes the biological (Physiological and biochemical) process underlying the clinical manifestations of disease and thereby bringing together material from a variety of sources. The clinical relevance and the laboratory investigation thereof, is stressed by the inclusion of relevant case studies, particularly those prevalent in the region.
Prerequisites: HML 4016