HMI - MEDICAL IMAGING (HMI)

HMI 2002 Medical Imaging Technology I (3-1-3)
Identify the basic design and function of standard medical X-ray equipment, X-ray image receptors, and X-ray image processing. In addition, recognize and explain the function of the various parts of an X-ray unit, how X-rays are produced, how X-rays interact with matter and the various factors that affect the quality and quantity of the X-rays produced. Describe the quality of medical images in precise terms, such as spatial and contrast resolution, with regard to As Low As Reasonably Achievable (ALARA) principles.
Prerequisites: HSC 1113

HMI 2003 Patient Care in Medical Imaging I (3-1-3)
Develop an understanding of the fundamentals of patient care in medical imaging environments, specifically in the areas of infection control, manual handling, patient communication and data confidentiality. Develop an understanding of patient care for mobile and restricted mobility patients, and clients frequently encountered in non-critical medical imaging departments. In addition to an introduction to basic radiation protection of patients.
Prerequisites: HSC 1123

HMI 2102 Medical Imaging Technology II (3-1-3)
Examine how digital medical images are produced, manipulated and transmitted between medical imaging modalities and hospital information systems. Define dedicated digital imaging systems such as Patient Archive and Communication Systems (PACS), Radiology Information Systems (RIS), and the parameters used in analysing digital image quality. Investigate the design, function and operation of fluoroscopic, mobile and theatre X-ray equipment.
Prerequisites: HMI 2002

HMI 2303 Medical Imaging Positioning and Procedures I (2-2-3)
Recognize the art of radiographic positioning for plain X-ray imaging, focusing on the upper and lower extremities, the spine, pelvis, hips, and chest. A mix of theory and simulated practice using medical imaging terminology will provide and develop radiographic positioning and patient care skills. Using the acquired knowledge and skills, examine a plain X-ray imaging of the appendicular skeleton, spine, and chest in modern medical imaging practice.
Corequisites: HMI 2002, HMI 2403

HMI 2403 Medical Imaging Anatomy and Pathology I (3-1-3)
Examine image critique skills for diagnostic images of the upper and lower extremities, the spine, pelvis, hips, and chest. Recognize, identify and describe normal medical imaging anatomy and commonly encountered pathologies on a range of X-ray examinations. Apply specific image interpretation terminology to evaluate image content in terms of normal and abnormal findings and to assess image quality. Develop an understanding of the nature of disease and the role of X-ray imaging in patient care and clinical management.
Prerequisites: HSC 1033
Corequisites: HMI 2303, HMI 2002

HMI 2503 Medical Imaging Positioning and Procedures II (2-2-3)
Recognize the art of radiographic positioning, and terminology used for procedures of plain X-ray imaging of abdomen, skull, maxillary-facial structures, and dentition. This course also focuses on contrast studies of gastrointestinal, urinary systems, and examine mobile and theatre imaging. Use medical imaging equipment to perform radiographic positioning and relevant patient care skills. Develop skills in plain medical imaging and the role of mobile, theatre and contrast media examinations in modern medical imaging practice.
Prerequisites: HMI 2303
Corequisites: HMI 2603

HMI 2603 Medical Imaging Anatomy and Pathology II (3-1-3)
Examine image critique skills for diagnostic images of the abdomen to include contrast studies of gastrointestinal, urinary systems. Additionally, examine image critique skills for diagnostic images of the skull, maxillary facial structures, dentition, mobile and theatre imaging. Apply specific image interpretation terminology to evaluate image content in terms of normal and abnormal findings. Develop an understanding of the nature of disease and the role of X-ray imaging in patient care and clinical management.
Prerequisites: HMI 2403
Corequisites: HMI 2503

HMI 2613 Clinical Preceptorship I (12-0-3)
Apply previously taught theory of medical imaging technique and patient care into authentic clinical practice. Learning takes place within safe, supervised, clinical learning sites approved by partner health authorities. Clinical Preceptorship will be supervised by trained preceptors to develop skills in safe radiographic technique and patient care for plain X-ray imaging of the upper and lower extremities, spine and chest.
Prerequisites: HMI 2303, HMI 2003

HMI 3002 Medical Imaging Technology III (3-1-3)
Develop a knowledge base in the design of equipment used to produce images in Nuclear Medicine (NM) examinations. Examine the design, use, and function of fluoroscopy equipment used in diagnostic, angiographic and interventional radiology. Evaluate radiation doses in specialist modalities to determine best clinical application. Demonstrate the use of dedicated mammography units and mammography accessories and compare mammography equipment with standard X-ray equipment.
Prerequisites: HMI 2102, HMI 2002
Corequisites: HMI 3103

HMI 3003 Patient Care in Medical Imaging II (3-1-3)
Develops knowledge and skills in basic concepts of patient care in ward, theatre, trauma, and acute care medical imaging environments. Includes safe patient handling for therapeutic interventions such as drips, oxygen, suction and electronic patient monitoring. Develop applied understanding of the safe administration of radiological contrast agents to include precautions of use and emergency responses to adverse contrast media reactions.
Prerequisites: HMI 2503, HMI 2003
Corequisites: HMI 3103

HMI 3013 Clinical Preceptorship II (0-12-3)
Apply previously taught theory into clinical practice.Learning takes place within safe, supervised, clinical learning sites. Develop further skills in the radiographic imaging of the skull, the abdomen and in elementary fluoroscopic and contrast study examinations.
Prerequisites: HMI 2613, HMI 2503

HMI 3103 Medical Imaging Positioning and Procedures III (3-1-3)
Describe application of specialized modalities; pediatric imaging, mammography, diagnostic and interventional fluoroscopy, Nuclear Medicine. Develop applied understanding of these modalities to evaluate their best use and their role in medical imaging practice.
Prerequisites: HMI 2503
Corequisites: HMI 3002

HMI 3113 Specialised Imaging I (2-2-3)
Develop the required technical knowledge of Computerized Tomography as a specialised imaging modality including an understanding of the scientific principles that form the basis of CT system. Describe the design and function of specific equipment used in Computerised Tomography (CT). Evaluate the clinical application of diagnostic and interventional CT in terms of clinical outcomes, radiation safety and patient care. Evaluate safe operation of medical imaging equipment in the acute care imaging.
Prerequisites: HMI 3103
Corequisites: HMI 3233

HMI 3213 Radiation Safety and Biology (3-1-3)
Develop knowledge of biological response to radiation. Take objective decisions regarding risks and benefits of radiation, radiation protection. Describe factors affecting biological response and dose limits. Develop applied understanding of best safety practices.
Corequisites: HMI 3113

HMI 3223 Cross Sectional Anatomy (3-1-3)
Analyze cross-sectional normal anatomy of brain, thorax, abdomen, pelvis, Musculoskeletal and circulatory systems. Develop the ability to evaluate cross-sectional anatomy and discuss the value of multi-planar sections utilizing modern medical imaging practices.
Prerequisites: HMI 2603

HMI 3233 Clinical Preceptorship III (0-12-3)
Apply previous theory into clinical practice and develop further skills in emergency CT imaging, angiographic imaging and, mammography. Learning takes place within safe, supervised, clinical sites.
Prerequisites: HMI 3013, HMI 3103, HMI 3003
Corequisites: HMI 3113

HMI 4003 Quality Management in Medical Imaging (3-1-3)
Develop skills in explaining and evaluating international quality management systems used to maintain and improve performance in health care organisations and justify their application in medical imaging. Apply basic quality measurement tools and critically appraise the results they provide. Analyse how quality management tools are used by health care organisations to deliver quality improvement that is timely, effective and patient centred. Assess how quality standards are used to maintain and improve medical imaging services as an integral part of a total quality management programme.

HMI 4013 Specialised Imaging II (2-2-3)
Develop the required technical knowledge of specialised imaging modalities including an understanding of the scientific principles that form the basis of each imaging system. Describe the design and function of specific equipment used in Magnetic Resonance Imaging (MRI) understand the different MRI sequences and scans pertained to different anatomy. Develop necessary skills to explain and evaluate the technical aspects of this advanced imaging system and its clinical applications.
Prerequisites: HMI 3113
Corequisites: HMI 4023

HMI 4023 Clinical Preceptorship IV (0-12-3)
Apply previous theory into the clinical practice and develop skills of advanced trauma, advanced (CT) imaging, and basic (MRI) to prepare for the clinical preceptorship V track of choice. Learning takes place within safe, supervised, clinical sites.
Prerequisites: HMI 3233
Corequisites: HMI 4013

HMI 4106 Clinical Preceptorship V (0-24-6)
Apply previously taught theory of advanced medical imaging techniques and patient care into authentic clinical practice. Select an elective modality; Computed Tomography CT, Magnetic Resonance Imaging MRI, or mammography to practice in the clinical setting under a mentor's supervision.
Prerequisites: HMI 4023
Corequisites: HMI 4113

HMI 4113 Specialized Imaging III (3-1-3)
Analyze knowledge gained and applied understanding of an elected area of specialist practice such as Computed Tomography (CT), Magnetic Resonance Imaging MRI, or breast imaging. Modalities offered for elective study are based on clinical availability to support the development of advanced clinical practice skills. Reflect upon personal competencies in a specialist imaging modality to evidence understanding of clinical practice at an advanced level.
Prerequisites: HMI 3103, HMI 4013, HMI 3113
Corequisites: HMI 4106

HMI 4203 Professional Practice (3-1-3)
Develop an understanding of the new imaging modalities and identify the best practice of their clinical application and indications. In addition to exploring the knowledge of the latest imaging protocols implemented in MRI, CT, PET/ CT, and Nuclear Medicine for different pathologies. The effective work flow in the digital environment for the best interest of patients is also explored using effective methods to incorporate HIS/RIS for electronic requesting, referrals education, and patient communication as well as its impact in health care cost and radiation dose.
Prerequisites: HMI 3113
Corequisites: HMI 4013