ASSOCIATE OF SCIENCE IN MEDICAL IMAGING COURSE DESCRIPTIONS

MI 304 Pharmacology and Drug Administration
Three semester hours
(Three hours theory per week) This course is designed to focus on the general principles for safe administration of pharmaceuticals. The science of medication administration is outlined stressing the assessment process, differences between many types of medications, patient trust and health promotion. The course continues by focusing on mathematics and calculations, and outlines the essential information for various drug groups.

MI 308 Overview of Medical Imaging
Three semester hours
(For non-RT students only; permission by instructor only)
(Three hours of theory per week) This course is designed to provide an introduction to the field of diagnostic medical imaging. Department personnel, organization, and workflow will be discussed to help familiarize the student with the intricacies of this unique clinical setting. Basic x-ray physics and instrumentation as well as the various diagnostic imaging modalities will be discussed. The course also stresses the importance of radiation safety, ethics and legal considerations, as well as professionalism.

MI 312 Principles of Quality in Medical Imaging
Three semester hours
(Three hours theory lab per week) This course focuses on the many facets of quality surrounding medical imaging. Methodologies to determine, evaluate and enhance quality are compared and contrasted. Standards of various accreditation agencies and bodies, which interface with medical imaging, are applied to various practice situations.

MI 330 Pathophysiology
Three semester hours
(Three hours theory per week) This course is designed to correlate anatomy and physiology and relate normal body functioning to the physiologic changes that occur as a result of illness, as well as the body's remarkable ability to compensate for these changes. The course will be organized into three areas of focus based on the health-illness continuum: (1) control of normal body functions; (2) pathophysiology or alterations in body function; and (3) system or organ failure.

MI 385 CT Externship
Three semester hours
(Minimum of 180 hours of clinical experience per semester) This course is designed to provide students with hands-on experiences in a supervised clinical setting. The student will apply concepts learned in their coursework to the performance of Computed Tomography examinations. Case studies, writing assignments and demonstration of prescribed competency examinations are requirements of the course.
Prerequisite: *MI 415.*
Co-requisite: *MI 416. When the courses are taken concurrently, failure of MI 416 will result in automatic failure of MI 385.*

MI 386 MRI Externship
Three semester hours
(Minimum of 180 hours of clinical experience per semester) This course is designed to provide students with hands-on experiences in a supervised clinical setting. The student will apply concepts learned in their coursework to the performance of Magnetic Resonance

Imaging examinations. Case studies, writing assignments and demonstration of prescribed competency examinations are requirements of the course.
Prerequisite: *MI 421.*
Co-requisite: *MI 422. When the courses are taken concurrently, failure of MI 422 will result in automatic failure of MI 386.*

MI 387 Angiography Externship
Three semester hours
(Minimum of 180 hours of clinical experience per semester) This course is designed to provide students with hands-on experiences in a supervised clinical setting. The student will apply concepts learned in their coursework to the performance of angiographic examinations. Case studies, writing assignments and demonstration of prescribed competency examinations are a requirement of the course.
Prerequisite: *MI 423.*
Co-requisite: *MI 423. When the courses are taken concurrently, failure of MI 423 will result in automatic failure of MI 387.*

MI 388 Mammography Externship
Three semester hours
(Minimum of 180 hours of clinical experience per semester) This course is designed to provide students with hands-on experiences in a supervised clinical setting. The student will apply concepts learned in their coursework to the performance of mammographic examinations. Case studies, writing assignments and demonstration of prescribed competency examinations are requirements of the course.
Prerequisite: *MI 427.*
Co-requisite: *MI 427. When the courses are taken concurrently, failure of MI 427 will result in automatic failure of MI 388.*

MI 391 Bone Densitometry Externship
Three semester hours
(Minimum of 180 hours of clinical experience per semester) This course is designed to provide students with hands-on experiences in a supervised clinical setting. The student will apply concepts learned in their coursework to the performance of bone densitometry procedures. Projects, writing assignments and demonstration of prescribed competency procedures are requirements of the course.
Prerequisite: *MI 432.*
Co-requisite: *MI 432. When the courses are taken concurrently, failure of MI 432 will result in automatic failure of MI 391.*

MI 410 Cross-Sectional Anatomy I
Three semester hours
(Three hours theory per week) Anatomical cross-sections of the head, neck, thorax and spine are presented to students using images of human anatomy. Physiological considerations of major structures will also be addressed. Students practice and assess their identification skills through review exercises.
Prerequisites: *BI 211 or HC 200 and BI 213.*

MI 411 Cross-Sectional Anatomy II
Three semester hours
(Three hours theory per week) Anatomical cross-sections of the abdomen, pelvis, and upper and lower extremities are presented to students using images of human anatomy. Physiological considerations of major structures will also be addressed. Students practice

and assess their identification skills through review exercises. Student engagement will be emphasized using a required service experience.
Prerequisites: *BI 211 or HC 200 and BI 213.*

MI 415 Computed Tomography
Three semester hours
(Three hours theory per week) This course focuses on the theories, physics, application and instrumentation of Computed Tomography (CT) equipment. The student will examine and critique image analysis as a means in learning to evaluate images for correct technique, imaging protocols and identification of proper anatomy. The course will also examine and explore means of correcting poor images and artifact identification.
Prerequisites: *MI 410 or MI 411.*

MI 416 Computed Tomography Protocols
Three semester hours
(Three hours theory per week) This course focuses on basic Computed Tomography (CT) protocol information in addition to adapting common protocols based on patient needs and radiation dose reduction. This course will include indications, pathology, positioning, patient preparation and contrast administration for CT examinations.
Prerequisite: *MI 415.*

MI 421 Principles of MRI Physics
Three semester hours
(Three hours theory per week) This course details the physical and biological principles of Magnetic Resonance Imaging (MRI). A historical perspective leading to the development of MRI and an introduction of the fundamentals of electricity and magnetism will be presented. The process of MRI will be discussed in detail, beginning with the patient entering the room through the final image. This course will also present the latest imaging methods available in MRI as they evolve.
Prerequisites: *MI 410 or MI 411.*
Co-requisite: *MI 411.*

MI 422 Principles of MRI Instrumentation
Three semester hours
(Three hours theory per week) This course discusses the latest imaging methods in Magnetic Resonance Imaging (MRI). Spin echo, gradient imaging, angiography, echo planar imaging, and the use of contrast agents and artifacts in MRI will be discussed. Related anatomical and physiological changes in various health states as revealed in MRI will be emphasized, with particular attention given to the central nervous system, thorax, abdomen, pelvis and extremities. The course is comprehensive, in that it spans from an examination and exploration of human responses to MRI procedures, through to the administration of an MRI department.
Prerequisite: *MI 421.*

MI 423 Angiographic and Interventional Procedures
Three semester hours
(Three hours theory per week) This course focuses on angiographic and interventional procedures. The students will be exposed to the basics of sterile technique, recording systems, automatic injectors, contrast media, catheters and accessories. The principles of angiography (arteriography, venography and lymphography) are presented, along with critiques of radiographic images. A wide range of vascular and nonvascular interventional procedures are examined in detail.

MI 427 Mammography
Three semester hours
(Three hours theory per week) This course is designed to provide participants the requisite theories, concepts, and praxis in performing mammographic procedures. Patient positioning, quality control and necessary patient education, along with the critique of radiographic images, serve as the foci of this course. The course also introduces the process of mammography image analysis where the participants will evaluate various images for correct positioning, proper technique and undesired artifacts.

MI 432 Bone Densitometry
Three semester hours
(Three hours theory per week) This course focuses on the anatomy, physiology and pathology of the human structural support system. The course will focus on the history of bone densitometry, tracing the early roots of the modality all the way through its advancements in today's scanners. The course will cover bone anatomy in detail, down to its cellular components. Bone pathologies that are significant to bone densitometry will also be covered in detail with an emphasis on osteoporosis.

MI 441 Medical Imaging Department Management
Three semester hours
(Three hours theory per week) This course is designed for the student going into department supervision and management. The student will learn the basics of budgets, personnel scheduling, counseling, and administrative and leadership duties.

MI 445 Digital Imaging
Three semester hours
(Three hours theory per week) This course explores the essential components of digital imaging systems for a diagnostic imaging facility. The process of digital imaging will be discussed in detail, focusing on the various aspects from initial selection and purchase to analysis and quality control of the system. Legal and security issues will also be discussed.
Prerequisite: *RT 120 for RT students.*
Prerequisite: *ARRT certification for MI only students.*
Prerequisite & Co-requisite: *MI 308 for other non-RT imaging professionals.*

MI 446 Imaging Informatics I
Three semester hours
This introductory course focuses on the role of the PACS administrator, process mapping, financial aspects of PACS procurement and project management skills. It also includes focus on computer networking and components such as HIS, RIS, HL7, and DICOM.
Prerequisite: *MI 445.*
Co-requisite: *MI 445.*

MI 447 Imaging Informatics II
Three semester hours
This class is a continuation of PACS and Imaging Informatics I. This course focuses on the requirements and ergonomics of a reading room and/or PACS. Legal issues such as HIPAA and necessary safeguards, disaster recovery, acceptance testing and troubleshooting are also covered.
Prerequisite: *MI 446.*

MI 448 Information Technology Fundamentals
Three semester hours
This course focuses on computer basics such as hardware, database, operating systems and networking and security concepts. Special focus will be placed on the integration of imaging informatics.
Prerequisite: *MI 446.*
Co-requisite: *MI 447.*

MI 449 Imaging Informatics Externship
Three semester hours
(Minimum of 180 hours of clinical experience per semester) This course is designed to provide students with hands-on experience in a supervised clinical setting. Working closely with a designated liaison, the student will apply concepts learned in their coursework to performance of digital imaging and PACS related procedures. The student will be exposed to a variety of issues and problems that will require them to contribute successful solutions. Projects, writing assignments and demonstration of prescribed competency procedures are requirements of the course. This externship will be followed by the advanced level externship course MI 450.
Prerequisites: *MI 447 and MI 448.*
Co-requisites: *MI 447 and MI 448. When the courses are taken concurrently, failure of MI 447 and/or MI 448 will result in automatic failure of MI 449.*

MI 450 Advanced Imaging Informatics Externship
Three semester hours
(Minimum of 180 hours of clinical experience per semester) The externship is the evidence-based practice research project to the PACS curriculum. This field experience will be under the supervision of designated administrators and Clarkson College faculty. This is an opportunity to apply classroom knowledge to real world use of a PACS system. During this course, the student will perform clinical hands-on practice in a supervised clinical setting and will put into practice the knowledge acquired in the PACS (MI 486 and MI 487) coursework. The student will be required to demonstrate competency for numerous procedures within the specialty area, focusing on both the routine and advanced including a wide variety of troubleshooting tasks that PACS administrators and managers experience.
Prerequisites: *MI 449, MI 445 and MI 446.*
Co-requisites: *MI 449, MI 447 and MI 448. When the courses are taken concurrently, failure of MI 447 and/or MI 448 will result in automatic failure of MI 450.*

MI 475 Advanced CT Externship
Three semester hours
(Minimum of 180 hours of clinical experience per semester) The student will perform hands-on practice in computed tomography. The student will obtain advanced clinical experience and will be required to demonstrate competency for numerous examinations within the specialty area, focusing on both routine and advanced procedures.
Prerequisite: *MI 415.*
Co-requisites: *MI 385 and MI 416. When MI 475 is taken concurrently with MI 416 and MI 385, failure of MI 416 will result in automatic failure of MI 385 and MI 475.*

MI 476 Advanced MRI Externship
Three semester hours
(Minimum of 180 hours of clinical experience per semester) The student will perform hands-on practice in magnetic resonance imaging. The student will obtain advanced clinical experience and will be required to demonstrate competency for numerous examinations within the specialty area, focusing on both routine and advanced procedures.
Co-requisites: *MI 422 and MI 386. When MI 476 is taken concurrently with MI 422 and MI 386, failure of MI 422 will result in automatic failure of MI 386 and MI 476.*

MI 477 Advanced Angiography Externship
Three semester hours
(Minimum of 180 hours of clinical experience per semester) The student will perform hands-on practice in angiography. The student will obtain advanced clinical experience and will be required to demonstrate competency for numerous examinations within the specialty area, focusing on both routine and advanced procedures.
Prerequisite: *MI 387.*
Co-requisite: *MI 387. When MI 477 is taken concurrently with MI 423 and MI 387, failure of MI 423 will result in automatic failure of MI 387 and MI 477.*

MI 478 Advanced Mammography Externship
Three semester hours
(Minimum of 180 hours of clinical experience per semester) The student will perform hands-on practice in mammography. The student will obtain advanced clinical experience and will be required to demonstrate competency for numerous examinations within the specialty area, focusing on both routine and advanced procedures.
Prerequisite: *MI 388.*
Co-requisite: *MI 388. When MI 478 is taken concurrently with MI 427 and MI 388, failure of MI 427 will result in automatic failure of MI 388 and MI 478.*

MI 481 Advanced Bone Densitometry Externship
Three semester hours
(Minimum of 180 hours of clinical experience per semester) The student will perform clinical hands-on practice in bone densitometry. The student will obtain advanced clinical experience and will be required to demonstrate competency for numerous examinations within the specialty area, focusing on both routine and advanced procedures.
Prerequisites: *MI 432 and MI 391.*
Co-requisite: *MI 391. When MI 481 is taken concurrently with MI 432 and MI 391, failure of MI 432 will result in automatic failure of MI 391 and MI 481.*

MI 492 Independent Studies in Medical Imaging
One to four semester hours
Study directed by a faculty person on a topic of the student's interest and the faculty member's expertise.
Prerequisites: *Permission by instructor*

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