

Course Descriptions

MI 201 Intro to Radiography (3hrs) Fall

Content is designed to provide an overview of the foundations in radiography and the practitioner's role in the health care delivery system. Principles, practices and policies of the health care organization(s) are examined and discussed in addition to the professional responsibilities of the radiographer. Students will become BCLS certified and undergo orientation required by JACHO prior to entering clinical practice. Students will be introduced to the concept of radiation protection for occupational workers, patients, family and visitors. PR: MTH 121, PHY 101, PHY 101L

MI 202 Patient Care in Imaging Science (3 Hrs) Fall

Content is designed to provide the basic concepts of patient care, including consideration for the physical and psychological needs of the patient and family. Routine and emergency patient care procedures are described, as well as infection control procedures using standard precautions. The role of the radiographer in patient education is identified.

MI 204 – Radiographic Anatomy (3 Hrs) Fall

Content is designed to introduce the student to radiographic anatomy. The student will identify anatomical structures depicted on radiographs including film radiography and digital imaging. The student will be introduced to sectional anatomy as demonstrated with computed tomography, magnetic resonance imaging and sonography. Emphasis is placed on identifying structures visible on correctly performed radiographic procedures.
PR: BSC 227, BSC 228

MI 205 Imaging Procedures I (4 Hrs) Fall

Content is designed to provide the knowledge base necessary to perform standard imaging procedures. Consideration is given to the evaluation of optimal diagnostic images. Includes a laboratory component. Students will practice imaging procedures in the laboratory prior to performing the procedure on patients. PR: BSC 227, BSC 228, MI 201: CR: MI 204, MI 206

MI 206 – Clinical Practice I Radiography (4 Hrs) Fall

Content and clinical practice experiences are designed to sequentially develop, apply, critically analyze, integrate, synthesize and evaluate concepts and theories in the performance of radiologic procedures. Through structured, sequential, competency-based clinical assignments, concepts of team practice, patient-centered clinical practice and professional development are discussed, examined and evaluated. Clinical practice experiences are designed to provide patient care and assessment, competent performance of radiologic imaging and total quality management. Levels of competency and outcomes measurement ensure the well-being of the patient preparatory to, during and following the radiologic procedure. Students will be assigned a number of mandatory and elective competencies to be completed during each clinical practice course.
CR: MI 201, MI 202, MI 203, MI 205

MI 207 – Imaging Procedures II (3 Hrs) Spring

Content is designed to provide the knowledge base necessary to perform standard imaging procedures, including basic computed tomography (CT) and special studies. Consideration is given to the evaluation of optimal diagnostic images. Includes a laboratory component. Students will practice imaging procedures in the laboratory prior to performing the procedure on patients. PR: BSC 227, BSC 228, MI 204, MI 205, MI 206: CR: MI 210

MI 208 – Pharmacology and Drug Administration (2 Hr) Spring

Content is designed to provide basic concepts of pharmacology. The theory and practice of basic techniques of venipuncture and administration of diagnostic contrast agents and/or intravenous medications is included. The appropriate delivery of patient care during these procedures is emphasized. Though regulations regarding the administration of contrast media and intravenous medications vary in different states and institutions, the official position of the American Society of Radiologic Technologists is that venipuncture falls within the profession's general scope of practice and practice standards. Therefore, it should be included in the didactic and clinical curriculum with demonstrated competencies of all appropriate disciplines regardless of the state or institution where the curriculum is taught.

PR: BSC 227, MI 202, MI 203, MI 204, proof of BCLS certification.

MI 209 – Introduction to Imaging Equipment (3 Hr) Fall

Content is designed to establish a knowledge base in radiographic, fluoroscopic, mobile and tomographic equipment requirements and design. The content also provides a basic knowledge of quality control and to provide entry-level radiography students with principles related to computed tomography (CT) imaging.

PR: MTH 121, PHY 101, PHY 101L

MI 210 – Clinical Practice II Radiography (4 Hrs) Spring

Students will begin clinical practice rotations in computed tomography, radiation oncology, nuclear medicine and cardiovascular procedures as well as diagnostic radiography. Emphasis is placed on achieving competency in mandatory and elective clinical procedures as required for ARRT certification.

PR: MI 206: CR: MI 207, MI 209

MI 211 – Seminar in Imaging Science (1Hr) Fall

Students will research and make short presentations on new developments in imaging science. Emphasis is placed on developing the student's oral communication skills, research skills, and introducing the student to the concept of continuing education as mandated by the ASRT.

MI 212-Seminar in Imaging Science (1 Hr) Spring

MI 213-Elective Clinical Practicum 1 (4 Hr) Summer Intercession

Elective clinical practicum in radiography or sonography

MI 214 – Intro to Sonography (3Hr) Summer Intercession Introduction to the principles of sonography.

MI 302 – Principles of Radiation Physics (3 Hr) Spring

Content is designed to establish a basic knowledge of the nature and characteristics of radiation, x-ray production and the fundamentals of photon interactions with matter. The student will be introduced to the concepts of radioactivity including half-life and radioactive decay. This course will provide basic knowledge of principles associated with diagnostic radiography, nuclear medicine imaging and radiation oncology.

PR: PHY 101, PHY 101L, MTH 121, MI 209.

MI 303 – Image Acquisition and Processing (3 Hr) Fall

Content is designed to establish a knowledge base in factors that govern the image production process. Film imaging with related accessories is emphasized. There is a laboratory component to this course. The student will be able to experimentally alter image acquisition factors and evaluate the effects without unnecessary exposure to the patient.

PR: MTH 121, MI 210

MI 304 – Radiographic Pathology (3 Hr) Spring

Content is designed to introduce concepts related to disease and etiological considerations with emphasis on radiographic appearance of disease and impact on exposure factor selection.

PR: BSC 227, BSC 228, MI 204

MI 305 – Clinical Practice IV Radiography (4 Hr) Fall

Students will continue clinical practice rotations in diagnostic radiography, computed tomography, radiation oncology, nuclear medicine and cardiovascular procedures. Emphasis is placed on achieving competency in mandatory and elective clinical procedures as required for ARRT certification including venipuncture.

MI 306 – Seminar in Imaging Science (1 Hr) Fall

Students will research and make short presentations on advanced practice methodologies in imaging science. Emphasis is placed on developing the student's oral communication skills, research skills, and introducing the student to the concept of continuing education as mandated by the ASRT.

MI 307 –Radiobiology (3 Hr) Fall

Content is designed to provide an overview of the principles of the interaction of radiation with living systems. Radiation effects on molecules, cells, tissues and the body as a whole are presented. Factors affecting biological response are presented, including acute and chronic effects of radiation. PR: BSC 227, BSC 228

MI 308 – Radiographic Image Analysis (2 Hr) Spring

Content is designed to provide a basis for analyzing radiographic images. Included are the importance of minimum imaging standards, discussion of a problem-solving technique for image evaluation and the factors that can affect image quality. Actual images will be included for analysis.

PR: MI 204, MI 205, MI 208, MI 303, MI 304

MI 309 – Digital Image Acquisition and Display (2 Hr) Spring

Content is designed to impart an understanding of the components, principles and operation of digital imaging systems found in diagnostic radiology. Factors that impact image acquisition, display, archiving and retrieval are discussed. Guidelines for selecting exposure factors and evaluating images within a digital system assist students to bridge between film-based and digital imaging systems. Principles of digital system quality assurance and maintenance are presented. PR: MI 303

MI 310 – Clinical Practice V Radiography (4 Hr) Spring

Students will continue clinical practice rotations in diagnostic radiography, computed tomography, radiation oncology, nuclear medicine and cardiovascular procedures. Emphasis is placed on achieving competency in mandatory and elective clinical procedures as required for ARRT certification including venipuncture. Special emphasis is placed on surgical, mobile and emergency radiography.

PR: MI 305

MI 311-Seminar in Imaging Science (1 Hr) Spring

Seminar on new and emerging techniques in imaging sciences

MI 312- Abdominal Sonography I (4 Hr) Fall

This course covers basic abdominal sonographic positioning and scanning protocols as it relates to normal anatomy of the abdomen. Laboratory included.

MI 313-Ultrasound Physics I (3 Hr) Fall

The focus of this course is to educate students about the physics of sound waves and their interaction with tissue enabling the display of diagnostic imaging. PR: PHY 101

MI 314-Clinical Practice I Sonography (4 Hr) Fall

Clinical practice experiences are designed for sequential development, application, critical analysis, integration, synthesis and evaluation of concepts and theories in the performance of sonographic procedures.

MI 315-Small Parts Sonography (3 Hr) Fall

This course covers anatomy, positioning and scanning protocol of the superficial structures.

MI 316-Abdominal Sonography II (3 Hr) Spring

This course covers basic abdominal sonographic positioning and scanning protocols as it relates to normal anatomy, anatomical variants, physiology to include the retroperitoneum, associated abdominal vasculature identified.

MI 317-Ultrasound Physics II (3 Hr) Spring

The focus of this course is to educate students about the physics of sound waves and their interaction with tissue enabling the display of diagnostic imaging. This is a continuation of MI 313 Ultrasound Physics I

MI 318-Vascular Sonography I (4 Hr) Spring

Discussion of vascular disease, duplex examinations with comparison to arteriography as it pertains to venous and visceral vascular examinations. Laboratory included.

MI 319-Clinical Practice II Sonography (4 Hr) Spring

Clinical practice experiences are designed for sequential development, application, critical analysis, integration, synthesis and evaluation of concepts and theories in the performance of sonographic procedures.

MI 320- Clinical Practicum II (4 Hr) Summer Intercession

Elective clinical practicum for radiography students; Required clinical practicum for sonography students.

MI 321-Imaging Procedures III (4 Hr) Fall

Content is designed to provide the knowledge necessary for advanced diagnostic radiographic imaging procedures.
PR: MI 205, MI 207

M 322-Radiation Safety (3 Hr) Spring

The course focuses on radiation safety including ionizing radiation dose limits for the occupational worker, patient and general public. PR: MI 302, MI 307

MI 401 – Seminar in Imaging Science (1 Hr) Spring

This course introduces the radiography students to ARRT exam taking skills, mock examinations of the ARRT matrix, and self-evaluation studies. Study methods and application are also covered. A study of realistic clinical problems and situations, with emphasis on analyzing and evaluating these problems to formulate acceptable imaging modalities is included. Upon successful completion of the course, including a mock ARRT exit exam, the student will be awarded the Certificate from St. Mary's Medical Center School of Medical Imaging that will allow the student to sit for the ARRT Primary exam in Radiography

MI 402 – Quality Management (3 Hr) Fall

This course is a core requirement for all students regardless of the Advanced Practice track. Quality management is important to ensure the proper functioning of equipment and compliance with government and accreditation standards. Thus, technologists should have an understanding of the activities and their role in the quality management (QM) process. This content is designed to expand the QM skills of the technologist to include digital imaging systems and the application of QM principles in an imaging department. Course will include review of the ARRT Post-primary exam in QM. Students who select the management track will be expected to initiate procedures outlined in the QM exam content. Candidates for the ARRT Advanced Practice exam are required to perform the required number of repetitions for each procedure. Repetitions must be performed within the 24 month period immediately before submitting the application for certification. Repetitions may be completed in less than 24 months.

PR: ARRT

MI 403 – Advanced Practice in Medical Imaging (3 Hr) Fall Meets Writing Across the Curriculum general education requirement for Marshall University

This course is a core requirement for all students regardless of the Advanced Practice track. The focus of the course will include advanced discussion of communication, human diversity including the political context of health care, health care policy formation, health care law and compliance, patient information management and teamwork.

MI 404 – Advanced Sectional Anatomy (3 Hr) Fall

The ability to locate and identify structures in the axial (transverse), sagittal, coronal and orthogonal (oblique) planes is critical in all imaging modalities. Volumetric data sets and three-dimensional reconstruction of the body structures are increasingly important to the critical diagnosis and treatment of diseases. To enhance patient care and assist physicians with the prognosis, radiologic science professionals must understand cross-sectional anatomy in each of the imaging modalities. Content will include discussion of advanced pathophysiology.

CR: MI 405, MI 407

MI 405 – CT procedures and equipment (3 Hr) Spring

This course will focus on advanced patient care skills including ACLS, imaging procedures and equipment in computed tomography.

PR MI 404

MI 406 – MRI procedures and equipment (3 Hr) Fall

This course will focus on advanced patient care skills including ACLS, imaging procedures and equipment in magnetic resonance imaging.

PR: MI 404

MI 407 – Cardiovascular Anatomy and Physiology (3 Hr) Spring

This course will focus on cardiovascular anatomy and physiology including the heart anatomy and coronary, systemic, pulmonary, peripheral and cerebral circulation. Content will include discussion of advanced pathophysiology relating to the vascular system including cardiac physiology.

PR: ARRT: CR: MI 407, MI 408

MI 408 – Vascular Interventional Imaging (3 Hr) Fall

This course will focus on advanced patient care skills including ACLS, procedures and equipment utilized in cardiovascular and vascular/interventional imaging.

MI 409 – Advanced Clinical Practice (4 Hr) Fall

Students in advanced clinical practice tracks will be required to complete ACLS certification. Students will be responsible for arranging clinical experience in an approved clinical facility in computed tomography, magnetic resonance imaging, vascular/interventional imaging or cardiac imaging. ARRT advanced practice exams in CT, MRI, VI and CV require that all recorded clinical procedures be completed within 24 months of the exam. Students will be advised of specific exam content.

MI 410– Research in Medical Imaging (3 Hr) Capstone Course, Writing Intensive, Spring

This course is a core requirement for all students regardless of the Advanced Practice Track. Research methods and information literacy are important because the health care profession is continually changing, which requires the radiologic technologist to possess new knowledge to function competently. The radiologic technologist should contribute to the body of knowledge and be able to effectively analyze resources to promote growth in the profession. The attitude of lifelong learning enables the radiologic technologist to stay in step with the current health care environment and be prepared to help foster the future and increase awareness of the profession in the global community. This content is geared to increase and disseminate intellectual inquiry, information literacy and the use of scholarly research methods.

Statistics, MI 402, MI 403.

MI 411-Transcultural Healthcare (3 Hr) Spring meets Multicultural and Writing Intensive This course is intended to provide an introduction to a culturally comparative analysis of health and healing. Readings provide both comparative ethnographic details and a theoretical framework for organizing and interpreting information about health. Class will meet weekly to discuss assigned readings. It is important that healthcare workers understand the concept of culture as a fluid, permeable, changeable set of collective beliefs, values, and behaviors that inform, shape and constrain the worldviews and personal choices of individuals in healthcare decision making. The course emphasizes a multidisciplinary approach to healthcare that will promote cultural sensitivity toward patients, physicians and healthcare professionals.

MI 412 – Radiography Management I (3 Hr) Fall

Course will provide radiographers with management principles pertinent to medical imaging, including imaging departmental accreditation.

PR : ARRT or ARDMS certification

MI 413 – Radiography Management II (3 Hr) Spring

Continuation of MI 412 to provide radiographer with management principles related to medical imaging.

PR : ARRT or ARDMS certification

MI 414 – Mammography (3 Hr) Fall

Introduction to medical imaging of the breast. Focus is to prepare student for advanced certification exam in Mammography.

MI 415-RIS and PACS Principles (3 Hr) Spring

Course content provides basic knowledge of digital storage systems, computer networking, radiology information systems (RIS), and picture archiving and communication systems (PACS).

PR : ARRT or ARDMS certification

MI 416-Obstetrical Sonography I (3 Hr) Fall

This course covers basic obstetrical sonographic positioning and scanning protocols as it relates to the normal anatomy of the fetus.

MI 417-Gynecological Sonography I (3 Hr) Fall

This course presents a study of anatomy and physiology of the nongravid and first trimester pelvis

MI 418-Registry Review Sonography (1 Hr) Fall

This course introduces the student to ARDMS exam taking skills, mock examinations of the ARDMS matrix, and self-evaluation studies. Study methods and application are also covered. A study of realistic clinical problems and situations, with emphasis on analyzing and evaluating these problems to formulate acceptable imaging modalities is included. Upon successful completion of the course, including a mock ARDMS exit exam, the student will be awarded the Certificate from St. Mary's Medical Center School of Medical Imaging that will allow the student to sit for the appropriate ARDMS exam.

MI 419-Clinical Practice III Sonography (4 Hr) Fall

Clinical practice experiences are designed for sequential development, application, critical analysis, integration, synthesis and evaluation of concepts and theories in the performance of sonographic procedures.

MI 420-Obstetrical Sonography II (2 Hr) Spring

This course focuses on sonographic techniques in high risk pregnancies and fetal abnormalities.

MI 421-Gynological Sonography II (2 Hr) Spring

This course presents a study of the pathology of the nongravid pelvis and first trimester.

MI 422-Clinical Practice IV Sonography (4 Hr) Spring

Clinical practice experiences are designed for sequential development, application, critical analysis, integration, synthesis and evaluation of concepts and theories in the performance of sonographic procedures

MI 423-Echsonography I (3 Hr) Fall

This course covers basic adult heart sonographic positioning and scanning protocols, as it relates to normal anatomy, anatomical variants and physiology of the adult heart.

MI 424-Vascular Sonography II (3 Hr) Fall

Discussion of vascular pathology and the use of plethysmography techniques in sonography

MI 425-Echsonography II (3 Hr) Spring

This course is a continuation of MI 423 and covers basic adult heart sonographic positioning and scanning protocols as it relates to anatomical variants and physiology of the adult heart.

MI 426-Advanced Clinical Practice II (4 hr) Spring

Students will arrange clinical experience in selected imaging modality to gain competency in clinical procedures required to sit for post-primary ARRT certification exams.

MI 427-Advanced Trauma-Surgical Radiography (3 hr) Fall

Advanced practice course in trauma and surgical radiography for imaging sciences.

MI 428-Forensic Radiography (3 hr) Spring (Elective for all imaging tracks)

This course will focus on introducing forensic radiography techniques and theoretical models.

MI 429-Geriatric and Pediatric Radiography (3 hr) Spring

This course will focus on advanced diagnostic imaging in the geriatric and pediatric population including mobile radiography.

MI 430-Mammography II (3 hr) Spring

Advanced medical imaging of the breast.

PR: MI 414

MI 431-Advanced Clinical Practice III (4 hr) Summer Intercession

Elective advanced clinical practicum in radiography or sonography.

MI 432-Advanced MRI Theory (3 hr) Spring

Advanced Magnetic Resonance Imaging Equipment and Procedures

MI 433-Point of Care Ultrasound (3 hr) Fall Elective

This course will introduce the basic principles of point of care ultrasound for vascular and cardiac interventional radiography. Recommended for students wishing to continue their education in radiation oncology.

MI 434-Cardiovascular Imaging (3hr) Fall

This course will focus on diagnostic and interventional procedures of the cardiovascular system.

MI 435-Seminar ARRT Exam Review II (1 hr) Spring

This is a review course for the ARRT primary exam certification

MI 436-Seminar Sonography Registry Review II (1hr) Spring

This course is designed to prepare the sonography student for their second specialty exam through the ARDMS

MI 437-Breast Sonography (3 Hr) Spring Elective

This course covers anatomy, positioning and scanning protocol for the breast as well as an introduction to ultrasound physics.

PR ARRT credentials or MI 414

MI 438-Fetal Echocardiography (3 Hr) Spring Elective

This course focuses on sonographic techniques in high risk pregnancies and fetal heart abnormalities.

Course will provide imaging student the opportunity to pursue independent study.