MEDICAL IMAGING AND RADIATION SCIENCES (MIRS)

MIRS 1. MIRS Advanced Standing Examination. 0-5 Credit Hours.
May be repeated with change in subject, multiple enrollment in the same semester, maximum credit 25 hours. Advanced Standing Examination. The College of Allied Health prepares and administers an advanced standing examination for specific courses.
Course Type: Lecture

MIRS 2. Experiential Learning Credit. 1-4 Credit Hours.
May be repeated with change in subject, multiple enrollment in the same semester, maximum credit 30 hours. The College of Allied Health certifies that the following student having completed a minimum of 12 credit hours towards a Bachelor of Science degree in Radiation Sciences is being granted experiential learning credit of 30 credit hours.
Course Type: Independent Study

MIRS 3111. Medical/Professional Orientation. 1 Credit Hour.
Prerequisites: By permission. A course providing an orientation to the professional roles and responsibilities of health care practitioners with emphasis on the student's role in the academic, clinic and professional environment of the Health Science Center. College of Allied Health, and Department of Medical Imaging and Radiation Sciences. (Summer III)
Course Type: Lecture

MIRS 3112. Pharmacology. 2 Credit Hours.
Prerequisites: By permission. An introduction to the basic concepts of pharmacology and pharmacotherapy. The course provides an overview of the drug classifications, properties, mechanisms of action and general effects with specific focus on action, dosage and administration of drugs used in the enrolled professions. (F IV)
Course Type: Lecture

MIRS 3133. Radiographic Imaging I. 3 Credit Hours.
Prerequisites: By permission. Course introduces the fundamental imaging concepts/acquisition related to the chest, abdomen, shoulder girdle, extremities, and alimentary tract and urinary systems including anatomical landmarks, patient positioning, equipment utilization, and responsible radiation management. The concepts of position versus projection, as well as radiographic distortion magnification, and superimposition are included. (Fall III)
Course Type: Lecture

MIRS 3152. Patient Care and Management. 2 Credit Hours.
Prerequisites: By permission. Course focuses on skills required when interacting with and caring for patients. Emergency response, infection control, aseptic and sterile preparation techniques, verbal and non-verbal communication, cultural competency, patient advocacy, patient safety and professional roles and responsibilities are additionally addressed. (Fall III)
Course Type: Lecture

MIRS 3172. Image Processing and Quality. 2 Credit Hours.
Prerequisites: By permission Presents concepts and techniques used in image processing and quality control in radiologic technology. The history of film imaging and image formation is covered. Computed radiography and digital radiography acquisition methodologies are discussed. Application of these technologies to clinical imaging and emerging imaging capabilities are covered. (Spring III)
Course Type: Lecture

MIRS 3193. Radiologic Physics and Radiation Protection. 3 Credit Hours.
Prerequisites: By permission A course in basic physical principles as it pertains to the properties of ionizing and non-ionizing radiations used in the clinical setting. Structure of matter, interaction with matter, radiation therapy, beam production, detection of radiation, biological risks and protection from radiation are emphasized. (Fall)
Course Type: Lecture

MIRS 3210. Special Assignment. 1-4 Credit Hours.
Prerequisite: None. May be repeated with change of content, maximum credit 4 hours. Research, preparation, and presentation of some scientific subject relevant to radiologic technology in either essay, exhibit, or lecture demonstration form to encourage independent study, documentation in logical manner, and participation in professional meeting and educational programs. The student may produce either a scientific essay or exhibit to be entered in either state or national student competition. Offered by disciplinary section(s).
Course Type: Independent Study

MIRS 3213. Radiographic Image Critique I. 3 Credit Hours.
Prerequisites: By permission. Course is designed to offer radiography students the basis for radiographic and digital image interpretation of anatomic structures and major organ systems, along with their pathologic presentation variations. It promotes the implementation of consistent techniques and methods for appropriate image analysis and interpretation in the clinical setting. (Sp III)
Course Type: Lecture

MIRS 3232. Radiographic Imaging II. 2 Credit Hours.
Prerequisites: Permission This course continues imaging concepts related to the spine, bony thorax, pelvis and skull, including specific anatomical landmarks, patient considerations and positioning, equipment utilization, and responsible radiation management. Methods and modifications for surgical intervention (OR) and emergency department (ED) are also covered. (Spring III)
Course Type: Lecture

MIRS 3233. Radiographic Principles in Exposure and Instrumentation. 3 Credit Hours.
Prerequisites: By permission Course covers the principles governing production of ionizing radiation and the principles underlying the operation of x-ray equipment and auxiliary devices. The x-ray tube and production of x-rays are covered to define x-ray production including discussion the x-ray beam composition in order to obtain optimum diagnostic images. (Spring III)
Course Type: Lecture

MIRS 3312. Radiographic Image Critique I. 2 Credit Hours.
Prerequisites: By Permission Course is designed to offer radiography students the basis for radiographic and digital image interpretation of anatomic structures and major organ systems, along with their pathologic presentation variations. It promotes the implementation of consistent techniques and methods for appropriate diagnostic image analysis and interpretation in the clinical setting. (Spring III)
Course Type: Lecture

MIRS 3412. Principles of Radiography. 2 Credit Hours.
Course surveys the historical development and usage of the various radiographic modalities, the professional and occupational development of this profession and the current major uses of radiography.
Course Type: Independent Study

MIRS 3421. Introduction to Healthcare Budgeting. 1 Credit Hour.
Prerequisites: By permission. Course introduces healthcare budgeting and budget analysis. Topics include incremental budgeting, forecasting, flexible budgeting, variance analysis, and capital budgeting within a healthcare department and across departments of an institution. (Sp III, IV)
Course Type: Lecture

MIRS 3422. Writing Seminar. 2 Credit Hours.
Prerequisites: By permission Course focuses on the process of scientific writing including planning, drafting, and revising. Students will review rules of scientific writing and implement those rules while writing an in-depth research paper. (Fall)
Course Type: Independent Study

MIRS 3432. Principles of Nuclear Medicine. 2 Credit Hours.
Course surveys the historical development and usage of nuclear medicine, the professional and occupational development of this profession and the current major diagnostic and therapeutic uses of nuclear medicine.
Course Type: Independent Study

MIRS 3452. Principles of Radiation Therapy. 2 Credit Hours.
Prerequisites: None Course surveys the historical development and usage of radiation therapy, the professional and occupational development of this profession and the current major uses of radiation therapy.
Course Type: Independent Study

MIRS 3460. Clinical Radiography. 1-4 Credit Hours.
Prerequisites: By permission May be repeated; maximum credit 4 hours. Clinical course introducing the basic understanding of the profession, including clinical terminology, routine clinical procedures, and performance expectations in the clinical setting. Students will execute basic aspects of radiologic technology through direct and indirect supervision as appropriate to the student's competency level. (Fall & Spring III)
Course Type: Clinical

MIRS 3493. Instrumentation and Safety. 3 Credit Hours.
Prerequisites: By permission Course reviews the physical principles and properties of ionizing and non-ionizing radiation used in medical imaging and radiation therapy clinical setting. A comparison of the mechanics of image production, interaction with matter, detection of radiation, biological risks, and protection from radiation are emphasized as related to department design and functionality. (Fall)
Course Type: Lecture

MIRS 3511. Patient Support Groups. 1 Credit Hour.
Prerequisites: By permission. May be repeated; maximum credit 4 hours. A course in which students enhance their professional knowledge, empathy and social abilities by attending patient support groups. The online structure of the course encourages critical thinking, discussion among students and improving compassion when caring for patients. (Summer II, IV)
Course Type: Independent Study

MIRS 3532. Nuclear Cardiology. 2 Credit Hours.
Prerequisites: By permission. A course providing instruction in gamma and PET nuclear cardiology. Topics include anatomy, physiology, pathology, electrocardiography, procedure protocols, stress protocols, image processing, image interpretation, pharmacology and patient education strategies pertinent to gated, first pass, myocardial perfusion and myocardial viability studies. (Summer III, IV)
Course Type: Lecture

MIRS 3533. Nuclear Medicine Instrumentation. 3 Credit Hours.
Prerequisites: By Permission. A course discussing the nuclear medicine radiation detection devices including components, electronics, applications, limitations and quality control. Instrumentation includes gas-filled detectors, ion chambers, scintillation detection systems, and semiconductor detectors. The course also covers medical informatics and ancillary equipment such as xenon trap machines, nebulizers, and centrifuges. (Sp III)
Course Type: Lecture

MIRS 3551. Introduction to Nuclear Medicine. 1 Credit Hour.
Prerequisites: By Permission. An introduction course to nuclear medicine technology including information concerning radiopharmaceuticals, radiation safety, equipment, quality control and procedures to prepare students for clinic experiences. (F III)
Course Type: Lecture

MIRS 3553. Nuclear Cardiology. 3 Credit Hours.
Prerequisites: By Permission. A course providing instruction in gamma and PET nuclear cardiology. Topics include anatomy, physiology, pathology, electrocardiography, procedure protocols, stress protocols, image processing, image interpretation, pharmacology and patient education strategies pertinent to gated, first pass, myocardial perfusion and myocardial viability studies. (SU IV)
Course Type: Lecture

MIRS 3554. Nuclear Medicine Procedures I. 4 Credit Hours.
Prerequisites: By Permission. A course covering the diagnostic and therapeutic nuclear medicine procedures including skeletal, gastrointestinal, hepatic, respiratory, endocrine and lymphatic imaging. (SP III)
Course Type: Lecture

MIRS 3560. Clinical Nuclear Medicine. 1-4 Credit Hours.
Prerequisites: Admission to the nuclear medicine program or permission. May be repeated; maximum credit 4 hours. A clinical education course in which students will execute basic nuclear medicine through direct and indirect supervision as appropriate to the student's competency level. Further development of technical skills; professionals skills; health care team role; department management knowledge; respect for cultural diversity; and decision-making skills are primary goals.
Course Type: Clinical

MIRS 3660. Clinical Radiation Therapy. 1-4 Credit Hours.
Prerequisites: Admission to the radiation therapy program or permission. May be repeated; maximum credit 12 hours. Directed clinical practice and discussion sessions that provide the opportunity for the student to perform basic radiation therapy procedures and develop clinical proficiencies and competencies. Students are directly supervised in the clinical setting.
Course Type: Clinical

MIRS 3801. Ultrasound Physics. 1 Credit Hour.
A course in the physics of ultrasound. The course will cover ultrasound wave generation and characteristics, interactions of sound and matter and the principes governing the production of ultrasound images.
Course Type: Lecture

MIRS 3802. Principles of Sonography. 2 Credit Hours.
Prerequisites: By permission. Course surveys the historical development & usage of sonography, professional & occupational development and current uses of medical sonography. (F III, IV)
Course Type: Lecture

MIRS 3803. Ultrasound Physics and Instrumentation I. 3 Credit Hours.
Prerequisites: By permission. This introductory course includes ultrasonic wave generation and propagation, interaction of ultrasound and matter, transducer and instrumentation designs, ultrasound scanning modes, image artifacts, image quality, Doppler effect, Doppler instrumentation components and related calculations. (Sp III)
Course Type: Lecture

MIRS 3834. Obstetric and Gynecologic Sonography. 4 Credit Hours.
Prerequisites: By Permission. Course provides instruction in sectional anatomy, pathophysiology, protocols, patient education principles, interpretation of 2D and 3D images, diagnostic testing and laboratory correlation related to obstetric and gynecologic sonography. (Sp III)
Course Type: Lecture

MIRS 3843. Cardiac Sonography I. 3 Credit Hours.
Prerequisites: By Permission. This introductory course will focus on cardiac anatomy, physiology, hemodynamics, image production and interpretation, and patient education techniques. Basic transthoracic and transesophageal cardiac examination protocols related to two dimensional, time-motion and Doppler components will be emphasized along with basic pathology. (F III)
Course Type: Lecture

MIRS 3851. Vascular Sonography I. 1 Credit Hour.
Prerequisites: By permission Course provides instruction on vascular hemodynamic principles and pathophysiology. Peripheral vascular sonographic imaging techniques and protocols are discussed. Protocol standards, image interpretation, Doppler evaluation, non-invasive and invasive imaging techniques and vascular pathology with are emphasized. (Sp III)
Course Type: Lecture

MIRS 3860. Clinical Sonography. 1-4 Credit Hours.
Prerequisites: By permission. May be repeated; maximum credit 12 hours. Clinical education course addressing basic general obstetric gynecologic, and cardiovascular sonographic techniques and protocols through direct and indirect supervision. Developing proficiency in basic patient care, ultrasound, physics and instrumentation, critical thinking, medical ethics, cultural diversity, professionalism, communication, and the sonographer's role on the healthcare team are primary goals. (Fall & Spring III)
Course Type: Clinical

MIRS 3872. Advanced Sonography I. 2 Credit Hours.
Prerequisites: By permission. This advanced course includes system-based and cross-sectional anatomy, anatomic variants and pathology of the head, neck, chest, abdomen, gravid and non-gravid pelvis, peripheral vascular system and superficial structures relevant to diagnostic medical sonography. Instruction includes relevant sonographic image production, image interpretation, examination protocols and pharmacology. (Su IV)
Course Type: Lecture

MIRS 3873. Abdominal Sonography. 3 Credit Hours.
Prerequisites: By Permission. This course will provide instruction in cross-sectional anatomy, pathology, image production, vascular Doppler interrogation, assessment and interpretation, sonography protocols, pharmacology, and patient education strategies related to abdominal, renal and small parts sonography. (Sp III)
Course Type: Lecture

MIRS 4142. Principles of Magnetic Resonance Imaging. 2 Credit Hours.
Prerequisites: Concurrent enrollment in Radiography Program. Designed to teach the theory and operation of MRI equipment, accessories and image production techniques as well as basic MRI exam protocol, patient care techniques, safety, and specific contrast media administration.
Course Type: Lecture

MIRS 4143. Principles of Magnetic Resonance Imaging. 3 Credit Hours.
Prerequisites: By Permission. Designed to teach the theory and operation of MRI equipment, accessories and image production techniques as well as basic MRI exam protocol, patient care techniques, safety, and specific contrast media administration. (F III, IV)
Course Type: Lecture

MIRS 4152. Sectional Anatomy & Pathology. 2 Credit Hours.
Prerequisites: Concurrent enrollment in a MIRS program. This course is designed to give students a basic understanding of sectional anatomy & pathology requisites to competently perform computed tomography and magnetic resonance imaging procedures. To enable the students to create optimal diagnostic images, this course provides the students with the ability to identify normal human anatomical structures in sectional images, and the ability to distinguish common pathological processes and variant anatomy.
Course Type: Lecture

MIRS 4173. Principles of Computed Tomography. 3 Credit Hours.
Prerequisites: By permission. Designed to teach the theory and operation of computed tomography equipment, accessories and image production technique as well as basic computed tomography exam protocol and patient care techniques and specific contrast media administration. (Fall III & IV)
Course Type: Lecture

MIRS 4191. Integration of Radiography Concepts. 1 Credit Hour.
Prerequisites: Concurrent enrollment in Medical Imaging & Radiation Sciences Program A comprehensive analysis/integration of the principles of Radiography delivered during the Radiography Program and their significance in optimal radiographic imaging.
Course Type: Lecture

MIRS 4192. Integration of Radiography Concepts. 2 Credit Hours.
Prerequisites: By Permission. A comprehensive analysis/integration of the principles of Radiography delivered during the Radiography program and their significance in optimum radiographic imaging. The emphasis is on the radiographer's role in determining those factors that will result in optimum imaging and competent clinical patient care. (SP IV)
Course Type: Lecture

MIRS 4193. Advanced Radiographic Imaging and Critique. 3 Credit Hours.
Prerequisites: By permission. Course covers unique and specialty views of the skull, extremities, and spine. Also promotes the development and utilization of critical thinking skills in the trauma/emergency environment. There is a focus on routine understanding and use of proper medical terminology for pathology identification and appropriate patient care. (Summer IV)
Course Type: Lecture

MIRS 4212. Principles of Mammography. 2 Credit Hours.
Prerequisites: By Permission. A course encompassing anatomy, equipment, positioning, imaging, quality control, and regulations related to mammography imaging. Course meets advanced certification educational requirements. (SP IV)
Course Type: Lecture

MIRS 4213. Principles of Vascular Imaging. 3 Credit Hours.
Prerequisites: By Permission. Course presents an overview of current diagnostic and therapeutic vascular and nonvascular procedures. Cardiac electrophysiology, hemodynamics, and methodology of patient care complexity during invasive procedures are presented, with an emphasis on applications, pathologies, protocols, and contrast media and medication use in the vascular and interventional radiology laboratory setting. (F IV)
Course Type: Lecture

MIRS 4222. PACS Administration. 2 Credit Hours.
Prerequisites: None This course will introduce students to the basic PACS architecture including DICOM, HL7 and teleradiology and other associated topics. It will present the skills and knowledge necessary for the successful planning implementation, and maintenance of a PACS. Clinical workflow in multiple modalities, daily tasks and long term maintenance will also be explored.
Course Type: Lecture

MIRS 4231. Fundamentals of Radiographic Physics. 1 Credit Hour.
Prerequisites: By Permission. This course addresses scientific units of measure and metric conversions, as well as the structure of matter as it relates to Newtonian physics. These concepts establish the foundation for the understanding laws of electrostatics and electrodynamics. The basics of X-ray equipment operation are established through generator and motor rules. (SU IV)
Course Type: Lecture

MIRS 4232. Advanced Radiographic Physics. 2 Credit Hours.
Prerequisites: By Permission. This course reviews the fundamentals of electromagnetism, before covering X-ray equipment circuitry. This involves transformers and rectifier use in the creation of high voltage production for X-ray photon creation. Additional topics include radiographic quality control management; X-ray interactions with tissue; fluoroscopic equipment operation; and tomographic equipment operation. (F IV)
Course Type: Lecture

MIRS 4233. Advanced Radiographic Physics. 3 Credit Hours.
Prerequisites: By permission A discussion of the structure of matter, type of radiation, x-ray circuitry, x-ray and fluoroscopy machine components and their role in x-ray production, quality control, and specific principles applicable to radiologic physics, basic physic, and electromagnetic physics. (Spring III, IV)
Course Type: Lecture

MIRS 4252. Nuclear Medicine Lab Regulations and Accreditation. 2 Credit Hours.
Prerequisites: By permission Course designed to broaden the student's knowledge and application of nuclear medicine governmental regulations; nuclear medicine department accreditation; and radioactive materials license processes and procedures. (Spring IV)
Course Type: Lecture

MIRS 4271. Nuclear Pharmacy. 1 Credit Hour.
Prerequisites: By permission. A course providing instruction in aspects of nuclear pharmacy relevant to the nuclear medicine technologist. Topics of discussion include radionuclide production: generators and QC, radiopharmaceuticals and quality control; dose kit preparation, biodistribution and adjunctive medications. (Summer IV)
Course Type: Lecture

MIRS 4272. Correlative Imaging in Radiation Sciences. 2 Credit Hours.
Prerequisites: By Permission Course introduces radiation science imaging and therapeutic procedures from a patient management perspective. Content focuses on patient protocol, procedure sequencing, and correlation of common pathologies that are diagnosed and treated with radiation science modalities. (Fall) IV
Course Type: Lecture

MIRS 4332. Radiobiology. 2 Credit Hours.
Prerequisites: By permission A course introducing the effects of ionizing radiation on cells which form human tissues, including qualitative response, radiosensitivity, normal and abnormal cell development, and the growth and structure of human cells. (Spring IV)
Course Type: Lecture

MIRS 4412. Clinical Accreditation and Regulations. 2 Credit Hours.
Prerequisites: By Permission. Course designed to broaden the student's understanding of accreditation and regulations governing the operation of clinics in the radiation science disciplines. Modules focus on accreditation standards, safety regulations, and patient advocacy. (Spring III, IV)
Course Type: Lecture

MIRS 4413. Medical Ethics in Popular Film. 3 Credit Hours.
Prerequisite: By Permission. A medical humanities course focusing on the social issues, professional values, and ethics demonstrated in modern films portraying the medical professions. Through written analyses and discussion boards students will compare film portrayals of medical practice to professional codes of ethics and scopes of practice for various medical professions. (Spring III, IV)
Course Type: Lecture

MIRS 4422. Professionalism Seminar. 2 Credit Hours.
Prerequisites: By Permission Course fosters individual professionalism and accountability among medical imaging and radiation therapy professionals. Students interact as both participants and presenters in a series of discussions and short write-ups on medical imaging , radiation oncology, health policy issues, medical ethics issues, professionalism and evaluation. (Fall IV)
Course Type: Lecture

MIRS 4460. Advanced Clinical Radiography & Capstone. 1-4 Credit Hours.
Prerequisites: By Permission May be repeated; maximum credit 10 hours. Clinical course which continues the development of diagnostic and advanced modality procedures, complex patient care, and the role of the radiologic technologist's in the clinical setting. Students will acquire advanced expertise of radiologic technology through direct and indirect supervision as appropriate to the student's competency level. (F, Sp, Su IV)
Course Type: Clinical

MIRS 4513. Nuclear Medicine Instrumentation. 3 Credit Hours.
Prerequisites: By Permission. A course discussing the nuclear medicine radiation detection devices including components, electronics, applications, limitations and quality control. Instrumentation includes gas-filled detectors, ion chambers, scintillation detection systems, and semiconductor detectors. The course also covers medical informatics and ancillary equipment such as xenon trap machines, nebulizers, and centrifuges. (Spring III)
Course Type: Lecture

MIRS 4521. Nuclear Pharmacy. 1 Credit Hour.
Prerequisites: By Permission. A course providing instruction in aspects of nuclear pharmacy relevant to the nuclear medicine technologist. Topics of discussion include radionuclide production; generators and QC, radiopharmaceuticals and quality control; dose kit preparation, biodistribution and adjunctive medications. (SP III)
Course Type: Lecture

MIRS 4522. Nuclear Medicine Lab Regs & Accreditation. 2 Credit Hours.
Prerequisites: By Permission. A course designed to broaden the student's knowledge and application of nuclear medicine governmental regulations; nuclear medicine department accreditation; and radioactive materials license processes and procedures. (SP III)
Course Type: Lecture

MIRS 4533. Imaging Devices in Nuclear Medicine. 3 Credit Hours.
Prerequisites: By Permission A course discussing the nuclear medicine imaging devices including, imaging physics, components, electronics, applications, limitations and quality control. Devices include gamma cameras, SPECT reconstruction and gating devices. (Fall) IV
Course Type: Lecture

MIRS 4534. Nuclear Medicine Procedures I. 4 Credit Hours.
Prerequisites: By Permission. A course covering the diagnostic and therapeutic nuclear medicine procedures including skeletal, gastrointestinal, hepatic, respiratory, endocrine and lymphatic imaging. (Spring III)
Course Type: Lecture

MIRS 4553. Nuclear Medicine Procedures II. 3 Credit Hours.
Prerequisites: By Permission A course covering the diagnostic and therapeutic nuclear medicine procedures including oncology, central nervous system, inflammatory, genitourinary and hematopoietic imaging. (Fall) IV
Course Type: Lecture

MIRS 4560. Advanced Clinical Nuclear Medicine & Capstone. 1-4 Credit Hours.
Prerequisites: By Permission. May be repeated; maximum credit 11 hours. Advanced course to develop entry-level competency in general nuclear medicine, nuclear cardiology and PET/CT imaging through direct and indirect supervision. The course is intended to apply knowledge and skills gained throughout the program into a culminating experience. A summative project is completed demonstrating a clinical application or scope of practice. (F, Sp, Su IV)
Course Type: Clinical

MIRS 4572. Advanced PET/CT Imaging. 2 Credit Hours.
Prerequisites: By Permission. A course designed to enhance knowledge of PET/CT imaging in the areas of imaging physics, radiopharmaceuticals, radiation safety, procedure protocols and patient care. Aspects of PET/CT will include oncology, neurology and cardiology. (Spring IV)
Course Type: Lecture

MIRS 4573. Advanced PET/CT Imaging. 3 Credit Hours.
Prerequisites: By Permission. A course designed to enhance knowledge of PET/CT imaging in the areas of imaging physics, radiopharmaceuticals, radiation safety, procedure protocols and patient care. Aspects of PET/CT will include oncology, neurology and cardiology. (SP IV)
Course Type: Lecture

MIRS 4603. Principles and Practice of Radiation Therapy I. 3 Credit Hours.
Prerequisites: Admission to program or permission This course introduces the student to the multidisciplinary approach to the treatment of cancer.
Course Type: Lecture

MIRS 4610. Treatment Planning Seminar in Radiation Therapy. 1-4 Credit Hours.
Prerequisite: MIRS 3711 or by permission. May be repeated with change of subject matter; maximum credit 4 hours. Daily treatment planning sessions conducted in the department. The student will observe the clinician, dosimetrist, and radiation therapist in their evaluation and decision making in regard to specific treatment modalities for the patient under treatment.
Course Type: Lecture

MIRS 4614. Physics of Radiation Therapy. 4 Credit Hours.
This course provides the student with the fundamentals of radiation therapy physics. This includes the structure of matter, nuclear transformations, interactions and measurement of ionizing radiation, absorbed dose, the quality of X-ray and electron beams, calibration of megavoltage beams of X-rays and electrons, isodose distributions, brachytherapy, protection and quality assurance/control.
Course Type: Lecture

MIRS 4623. Quality Management & Clinical Operations in Radiation Oncology. 3 Credit Hours.
Prerequisites: By Permission. The course focuses on the evolution of quality management (QM) programs and continuing quality improvements in radiation oncology. The course will emphasize the importance of documentation and assessment of outcomes. Billing, departmental budgets and human resource issues will be discussed as they apply to the radiation oncology department. (SP IV)
Course Type: Lecture

MIRS 4632. Patient Care in Radiation Therapy. 2 Credit Hours.
Prerequisites: By Permission. This course provides the student with concepts of patient care including the considerations for the physical and psychological needs of the patient and family. Comprehensive study of symptoms commonly associated with cancer therapies and their supportive care and management during and after treatment is emphasized. (SP IV)
Course Type: Lecture

MIRS 4660. Advanced Clinical Radiation Therapy & Capstone. 1-5 Credit Hours.
Prerequisites: By Permission May be repeated; maximum credit 11 hours. Advanced competency-based radiation therapy clinical rotations and discussion sessions in which second year students perform and discuss basic and advanced radiation therapy procedures. The students are directly supervised in the clinical setting. (F, Sp, Su IV)
Course Type: Clinical

MIRS 4703. Principles and Practice of Radiation Therapy II. 3 Credit Hours.
Prerequisites: By permission. This course provides the student with the concepts of clinical radiation oncology. This includes the etiology, pathology, methods of treatment and simulation, patient prognosis, the effects of combined therapies and the therapists' role in disease management. (Summer IV)
Course Type: Lecture

MIRS 4722. Quality Management & Clinical Operations in Radiation Oncology. 2 Credit Hours.
Prerequisites: None This course focuses on the evolution of quality management programs and continuing quality improvements in radiation oncology. The course will emphasize the importance of documentation and assessment of outcomes. Billing, departmental budgets and human resource issues will be discussed as they apply to the radiation oncology departments. (Spring)
Course Type: Lecture

MIRS 4723. Principles and Practice of Radiation Therapy III. 3 Credit Hours.
Prerequisites: By permission This course provides the student with the concepts of clinical radiation oncology. This includes the etiology, pathology, methods of treatment and simulation, patient prognosis, the effects of combined therapies and the therapists' role in disease management. Continuation of MIRS 4703 (Fall) IV
Course Type: Lecture

MIRS 4733. Patient Care in Radiation Therapy. 3 Credit Hours.
Prerequisites: MIRS 3152 or by permission. This course provides the student with concepts of patient care including considerations of the physical and psychological needs of the patient and his/her family. Comprehensive study of symptoms commonly associated with cancer therapies and their supportive care and management, during and after treatment, is emphasized.
Course Type: Lecture

MIRS 4760. Advanced Clinical Studies. 2-5 Credit Hours.
Prerequisites: None Provides advanced clinical experience in specialty areas of diagnostic imaging. Students will have opportunities to complete competencies required by certification boards. Students will engage in a discussion sessions and follow up quizzes to enhance clinic experiences. (Fall, Spring, Summer)
Course Type: Clinical

MIRS 4773. Radiation Dosimetry and Instrumentation. 3 Credit Hours.
Prerequisites: by permission. This course covers the principles of radiation therapy, dosimetry, and instrumentation. Topics include aspects of calibration, monitoring, protection, quality assurance and dose determination of X- and gamma radiations. The student will calibrate dose through hand and computer-based calculation. (Sp, IV)
Course Type: Lecture

MIRS 4803. Ultrasound Physics and Instrumentation II. 3 Credit Hours.
Prerequisites: By permission. This advanced course focuses on advanced ultrasound concepts such as signal processing, 3D/4D volume imaging, harmonics, compounding, elastography, fusion and panoramic imaging. Ultrasound safety, including bioeffects and quality control, are also addressed. (F IV)
Course Type: Lecture

MIRS 4810. Interdisciplinary Seminar. 1-3 Credit Hours.
Prerequisites: None. May be repeated; maximum credit 6 hours. Weekly seminars which focus on areas of ultrasound usage, peripheral to the major specialties. Additional topics of interest to sonography may be presented.
Course Type: Independent Study

MIRS 4820. Sonography Imaging. 1-3 Credit Hours.
Prerequisites: By Permission. May be repeated; maximum credit 6 hours. The application of didactic content into a simulation setting. Students will gain additional practice and proficiency in sonographic imaging to prepare them to complete competencies in the clinical setting. (F, Sp, & S IV)
Course Type: Laboratory

MIRS 4831. Advanced Obstetric Sonography. 1 Credit Hour.
Prerequisites: By Permission. Course provides instruction in advanced obstetric topics related to pathophysiology, protocols, image interpretation, correlative imaging and invasive procedures. (Su IV)
Course Type: Lecture

MIRS 4842. Cardiac Sonography II. 2 Credit Hours.
Prerequisites: By Permission. Course provides instruction on cardiac hemodynamic principles and pathophysiology as it relates to imaging techniques, protocol standards, image interpretation, Doppler evaluation, and correlation with other cardiovascular imaging modalities. (F IV)
Course Type: Lecture

MIRS 4843. Cardiac Sonography III. 3 Credit Hours.
Prerequisites: By permission. Course providing instruction on advanced cardiac imaging techniques including congenital anomalies, anatomic variants, basic pharmacology and pathophysiology of the cardiovascular system. Advanced transthoracic, transesophageal, examinations and sonographic imaging techniques are emphasized. (Sp IV)
Course Type: Lecture

MIRS 4852. Vascular Sonography II. 2 Credit Hours.
Prerequisites: By Permission Course provides instruction on vascular hemodynamic principles and pathophysiology. Peripheral and visceral vascular sonographic imaging techniques and protocols are discussed. Protocol standards, image interpretation, Doppler evaluation, non-invasive and invasive imaging techniques and therapies, and correlating cardiovascular pathology with other imaging modalities are emphasized. (F IV)
Course Type: Lecture

MIRS 4860. Advanced Clinical Sonography & Capstone. 1-5 Credit Hours.
Prerequisites: By Permission. May be repeated; maximum credit 5 hours. Advanced course to develop entry-level competency in general, OB/GYN, and cardiovascular sonography through direct and indirect supervision. The course is intended to apply knowledge and skills gained throughout the program into a culminating experience. A summative project is completed demonstrating a clinical application or scope of practice. (F, Sp, S IV)
Course Type: Clinical

MIRS 4872. Advanced General Sonography II. 2 Credit Hours.
Prerequisites: By Permission. This advanced course includes advanced anatomy, anatomic variants and pathology of the head, neck, chest, abdomen, gravid and non-gravid pelvis, peripheral vascular system and superficial structures relevant to diagnostic medical sonography, Instruction includes relevant advanced sonographic image production, image interpretation, examination protocols and pharmacology. (Spring IV)
Course Type: Lecture

MIRS 4963. Multidisciplinary Capstone Seminar in Radiologic Technology. 3 Credit Hours.
Prerequisites: By Permission. An interdisciplinary course in which students interact through a series of seminars that presents their specialty in the larger context of healthcare. The role of the healthcare professional and the scope of practice is emphasized. A research paper pertaining to a clinical application or a healthcare concept is required. (Spring IV)
Course Type: Lecture

MIRS 4990. Special Studies in Medical Imaging Radiation Sciences. 1-6 Credit Hours.
Prerequisites: By permission. May be repeated with change of subject matter, multiple enrollment allowed in same semester, maximum credit 6 hours. An individual instruction course in which the student, with the approval of and under the supervision of the instructor, may utilize readings, and/or research projects, and/or practicum, and/ or attendance at seminars or lectures, to explore and participate in one or more of several special subject areas of interest (offered by disciplinary section).
Course Type: Independent Study