

Radiologic Technology (RAD)

Course Descriptions

RAD 110: Introduction to Patient Care & Pharmacology (45 class hours = 3 credits)

This course discusses professional roles and behaviors and legal, ethical, and cultural issues within the health care environment. Presentation includes age-specific care and communication and infection control concepts. This course prepares students to provide general patient care procedures to include vital signs, aseptic and sterile techniques, venipuncture, transfer of patient, care of medical equipment, and contrast media administration. Basic information on drug therapy is discussed.

Prerequisite: Admission to the program.

Co-requisites: RAD 120, RAD 150.

RAD 120: Radiographic Anatomy & Procedures I (45 class hours, 30 hours lab = 4 credits)

A presentation of radiographic positioning principles and terminology, radiographic anatomy and positioning of the chest, abdomen, upper and lower limbs, shoulder girdle, and other radiographic procedures. Includes laboratory demonstration, practice, and competency-based examinations of material presented in the classroom.

Prerequisite: Admission to the program.

Co-requisites: RAD 110, RAD 150.

RAD 121: Radiographic Anatomy & Procedures II (45 class hours, 30 hours lab = 4 credits)

A presentation of radiographic positioning principles and terminology, radiographic anatomy and positioning of the femur, pelvic girdle, spine, bony thorax, pediatric, trauma, and other radiographic procedures. Includes laboratory demonstration, practice, and competency-based examinations of material presented in the classroom.

Prerequisites: RAD 110, RAD 120, RAD 150.

Co-requisites: RAD 151, RAD 160.

RAD 150: Clinical Radiography I (135 clinical hours = 3 credits)

This course orients students to medical imaging and clinical settings. Safe radiation practices, magnetic resonance imaging safety, patient care, confidentiality, and professional responsibilities are discussed. Medical imaging equipment and technical factors are reviewed. Clinical policies and procedures, online recordkeeping system, and competency requirements are presented. Clinical site orientation material is completed and visitation to the clinical sites is conducted. Students are introduced to the patient care environment through direct and indirect supervision based on the theories presented in the didactic and laboratory components of the program. There will be emphasis on the care of patients of all ages, different patient conditions, demonstrating, performing, and evaluating for competency of radiographic procedures, identification and operation of basic and

advanced medical imaging equipment, functioning with other medical personnel, and administrative functions for medical imaging.

Prerequisite: Admission to the program.

Co-requisites: RAD 110, RAD 120.

RAD 151: Clinical Radiography II (180 clinical hours = 4 credits)

The student will continue to develop technical skills, interpersonal skills, critical thinking skills, and communication skills in the clinical setting. The student will continue to rotate within diagnostic radiography and be evaluated for competency, continue to improve efficiency, and be able to identify anatomy through image analysis in basic radiography.

Prerequisites: RAD 110, RAD 120, RAD 150.

Co-requisites: RAD 121, RAD 160.

RAD 160: Medical Imaging I (45 class hours = 3 credits)

This course provides a comprehensive foundation in x-ray physics and image acquisition. An introduction to the principles of ionizing radiation, atomic structure, electromagnetism, x-ray production, and radiation interaction with matter are presented. Emphasis is placed on exposure factor selection, automatic exposure control systems, and their effects on image quality. Students evaluate radiographic images based on brightness, contrast, spatial resolution, distortion, and noise, and examine image receptor technology and digital imaging principles through classroom and laboratory instruction.

Prerequisites: RAD 110, RAD 120, RAD 150.

Co-requisites: RAD 121, RAD 151.

RAD 220: Radiographic Anatomy & Procedures III (24 class hours, 12 lab hours = 2 credits)

This course is a presentation of radiographic anatomy and positioning of the cranium, paranasal sinuses, facial bones, contrast studies of the body tracts and systems, and special procedures. It includes laboratory demonstration, practice, and competency-based examinations of material presented in the classroom.

Prerequisites: RAD 121, RAD 151, RAD 160.

Co-requisites: RAD 250, RAD 270.

RAD 230: Radiographic Pathology (30 class hours = 2 credits)

A study of nature and etiology of disease, this course is designed to integrate the changes that occur through disease and injury, and the conditions of illness particular to the various body systems with correlation to radiographic imaging.

Prerequisites: RAD 251, RAD 260, RAD 271, RAD 280

Co-requisites: RAD 252, RAD 272

RAD 250: Clinical Radiography III (225 clinical hours = 5 credits)

The student will continue to develop technical skills, interpersonal skills, critical thinking skills, and communication skills in the clinical setting. The student will

continue to rotate within diagnostic radiography and be evaluated for competency, continue to improve efficiency, be provided with the opportunity to perform more independently, and be able to identify anatomy through image analysis in basic radiography.

Prerequisites: RAD 121, RAD 151, RAD 160.

Co-requisites: RAD 220, RAD 270.

**RAD 251: Clinical Radiography IV
(225 clinical hours = 5 credits)**

The student will continue to develop technical skills, interpersonal skills, critical thinking skills, and communication skills in the clinical setting. The student will continue to be evaluated for competency, continue to improve efficiency, be provided with the opportunity to perform more independently, and be able to identify anatomy through image analysis in basic radiography. The student will continue rotations within diagnostic radiography as well as other advanced modalities based on availability.

Prerequisites: RAD 220, RAD 250, RAD 270.

Co-requisites: RAD 230, RAD 271, RAD 280.

**RAD 252: Clinical Radiography V
(225 clinical hours = 5 credits)**

The student will continue to develop technical skills, interpersonal skills, critical thinking skills, and communication skills in the clinical setting. The student will continue to improve efficiency, be provided with the opportunity to perform more independently, and be able to identify anatomy through image analysis in basic radiography. The student will continue rotations within diagnostic radiography as well as other advanced modalities based on availability.

Prerequisites: RAD 230, RAD 251, RAD 271, RAD 280.

Co-requisites: RAD 260, RAD 272.

**RAD 260: Radiation Biology & Protection
(30 class hours = 2 credits)**

This course examines the physics of radiation interaction with matter and the biological effects of ionizing radiation on living systems, including both early and late cellular responses. Emphasis is placed on radiation protection principles and dose-limitation strategies for patients, radiologic personnel, and the general public. Instruction includes radiation monitoring methods, exposure measurement, dose limits, and regulatory standards governing diagnostic radiography. Fundamental radiation safety practices and protective measures used in clinical imaging environments are introduced.

Prerequisites: RAD 220, RAD 250, RAD 270

Co-requisites: RAD 251, RAD 271, RAD 280

**RAD 270: Medical Imaging II
(30 class hours = 2 credits)**

This course includes discussion of x-ray equipment and circuitry, filtration, and methods for minimizing patient dose. Fundamental x-ray physics principles influencing beam intensity and radiographic density are examined, with emphasis on the inverse square law, the density

maintenance formula, and the 15% rule. The use of beam-limiting devices, patient variables, and grids and their effects on radiographic exposure are examined. Students will apply these concepts by solving radiographic exposure problems, making exposure adjustments to achieve desired radiographic density, and developing various types of exposure charts.

Prerequisites: RAD 121, RAD 151, RAD 160.

Co-requisites: RAD 220, RAD 250.

**RAD 271: Medical Imaging III
(45 class hours = 3 credits)**

The continued study of radiographic imaging with emphasis on more sophisticated recording media and specialized techniques of image detection and recording including computers such as DSA, DF, and DR. Several modes of imaging systems and image detection principles including fluoroscopy and image intensification are presented in detail. The student will become familiarized with the aspects of quality assurance and tests involved in evaluating the quality performance for radiographic equipment and accessories. Subject material of advanced imaging modalities will be covered to include vascular interventional procedures, cardiac catheterization lab, MRI, sonography, mammography, bone densitometry, nuclear medicine, CT and radiation therapy. The student will research the types of equipment, radiation exposure, education, and certification requirements for each modality.

Prerequisites: RAD 220, RAD 250, RAD 270.

Co-requisites: RAD 230, RAD 251, RAD 280.

**RAD 272: Medical Imaging IV
(45 class hours = 3 credits)**

This course provides a basis for analyzing radiographic images for evaluation and factors that can affect image quality. A comprehensive review will include mock registry examinations to strengthen and support knowledge attained in all curriculum course work and aid students in preparation for the ARRT certification examination.

Prerequisites: RAD 230, RAD 251, RAD 271, RAD 280.

Co-requisites: RAD 252, RAD 260.

**RAD 280: Independent Research Project
(15 class hours = 1 credit)**

The student has the opportunity to investigate a modality or a medical imaging issue in depth. Methods to research aspects of medical imaging are discussed to assist with a written research paper. Resume writing, cover letter, and interview skills are presented.

Prerequisites: RAD 220, RAD 250, RAD 270.

Co-requisites: RAD 230, RAD 251, RAD 271.