

# RADIOGRAPHY (RAD)

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## **RAD 100 Introduction to Diagnostic Imaging (2 Credits)**

RAD

This course is a prerequisite for admission to the radiography program. The purpose of this course is to provide an overview of diagnostic medical imaging modalities with emphasis on the role of the radiologic technologist in the healthcare delivery system. Topics include historical development of radiological sciences, professionalism, career development, organization of healthcare systems, introduction to radiographic equipment, procedures, radiation protection and medicolegal issues. Level I Prerequisite: Academic Reading and Writing Levels of 6

## **RAD 101 Methods in Patient Care (1 Credit)**

RAD

In this course, students learn how to communicate with patients therapeutically, how to assess a patient's condition, and how to provide quality care. This course will include laboratory sessions which will teach the patient care skills that are within the scope of practice for a radiologist technologist, such as vital signs, blood pressure, venipuncture, airway management; patient transfer and immobilization techniques; infection control practices; aseptic and non-aseptic techniques. Level I Prerequisite: Academic Reading and Writing Levels of 6; Admission to Radiography program

## **RAD 103 Medical Professionalism in Clinical Radiography (1 Credit)**

RAD

This course is an introduction to clinical education, clinical supervision, and professionalism in the medical imaging settings. Topics include patient privacy and information confidentiality, professional behavior, student clinical skill performance and assessment, and the Clinical Instructor-student dynamic. Level I Prerequisite: Academic Reading and Writing Levels of 6; Admission to Radiography program

## **RAD 110 Clinical Education (2 Credits)**

RAD

In this course, students will participate in 240 hours of structured clinical experience under the direct and indirect supervision of a registered radiographer. Students apply knowledge and skill in positioning the upper extremity, chest and abdomen for radiographic procedures. This course has a major focus on patient care and communication, requiring students to demonstrate professional ethics, empathy and professional behavior. Students will receive training in equipment operation, image processing, and radiation safety. Level I Prerequisite: Academic Reading and Writing Levels of 6; RAD 101 minimum grade "C-"

## **RAD 111 Fundamentals of Radiography (2 Credits)**

RAD

This course is designed to prepare students to operate radiographic equipment in the clinical setting. Students will acquire the knowledge and skills needed when they operate basic fixed and mobile x-ray equipment and accessory devices that are used to produce quality diagnostic radiographic images. This course will include laboratory sessions which will integrate the theories of image production with the practical application of equipment operation using phantoms. Level I Prerequisite: Academic Reading and Writing Levels of 6; Admission to Radiography program

## **RAD 112 Radiographic Positioning I (2 Credits)**

RAD

In this course, students are introduced to the theories and practices that are utilized in the clinical setting to produce diagnostic radiographs of the chest, abdomen and upper extremities. Radiographic terminology, patient preparation, patient positioning, proper manipulation of radiographic equipment, radiation safety practices, image evaluation, professional standards and medical ethics will be discussed and practiced in the laboratory setting. Level I Prerequisite: Academic Reading and Writing Levels of 6; RAD 101 and RAD 110, minimum grade "C-"; RAD 101 and RAD 110 may enroll concurrently

## **RAD 120 Clinical Education (2 Credits)**

RAD

In this course, students apply knowledge and skills in positioning the spinal column, lower extremities and related anatomy in a structured clinical experience. This course continues the discussion of professional behaviors including ethics, empathy, cultural competence, patient safety, and radiation safety. Equipment manipulation and operation, in addition to image processing and archiving are emphasized in this course. Level I Prerequisite: Academic Reading and Writing Levels of 6; RAD 110 minimum grade "C-"

**Corequisites:** RAD 123

## **RAD 123 Radiographic Positioning II (2 Credits)**

RAD

In this course, students explore the theories and practices that are utilized in the clinical setting to produce diagnostic radiographs of the lower extremity, vertebral column and bony thorax. Radiograph terminology, patient preparation, patient positioning, proper manipulation of radiographic equipment, radiation safety practices, image evaluation, professional standards and medical ethics will be discussed and practiced in the laboratory setting. Level I Prerequisite: Academic Reading and Writing Levels of 6; RAD 112 and RAD 120, minimum grade "C-"; RAD 120 may enroll concurrently

## **RAD 124 Principles of Radiographic Exposure (2 Credits)**

RAD

This course is a continuation of material presented in RAD 111. The content of this course includes a comprehensive study of atomic theory, radiographic exposure technique, image production using analog and digital mediums, and the appropriate use of radiographic accessory devices. Students will learn theoretical principles for achieving optimal image quality and techniques for reducing patient radiation exposure. Laboratory sessions are included to provide a means of integrating theory with practical applications for use in the clinical setting. Level I Prerequisite: Academic Reading and Writing Levels of 6; RAD 101 minimum grade "C-"

## **RAD 125 Radiographic Procedures and Related Anatomy (3 Credits)**

RAD

In this course, students will learn how to obtain quality images of the gastrointestinal system, accessory organs, urinary system, as well as other special procedures associated with radiography. Students will also learn the practical applications of being introduced to contrast media and the appropriate use of fluoroscopic equipment and imaging accessories. Level I Prerequisite: Academic Reading and Writing Levels of 6; RAD 110 minimum grade "C-"; may enroll concurrently

**RAD 150 Clinical Education (3 Credits)**

RAD

This course provides structured clinical experience in the application of knowledge and skill in positioning the chest and thorax, abdomen, spinal column, upper and lower extremities and related anatomy while working in general, portable and fluoroscopic radiography. The course also provides students with an opportunity to learn and demonstrate professional ethics, courtesy and empathy in handling patients, radiation safety, film processing/imaging plate (IP) handling and image archiving and radiographic equipment manipulation. Level I Prerequisite: Academic Reading and Writing Levels of 6; RAD 120 minimum grade "C-"

**RAD 190 Physical Foundations of Radiography (3 Credits)**

RAD

This course covers the theoretical and practical application of radiation physics with an emphasis on electromagnetic radiation, electricity, magnetism, x-ray circuitry, radiation production and radiation's interaction with matter. This course was previously RAD 200. Level I Prerequisite: Academic Reading and Writing Levels of 6; RAD 110 minimum grade "C-"

**RAD 215 Radiography of the Skull (2 Credits)**

RAD

In this course, students learn how to obtain quality radiographic images of the skull, temporal bones, facial bones, and paranasal sinuses. Students will also analyze radiographic images of these areas to identify pertinent anatomy and appropriate positioning. Laboratory sessions are included to provide the student with experience in skull positioning. Level I Prerequisite: Academic Reading and Writing Levels of 6; RAD 110 and RAD 120, minimum grade "C-"; RAD 120 may enroll concurrently

**RAD 217 Clinical Education (3 Credits)**

RAD

In this course, students will be provided with a structured clinical experience in which they will apply knowledge and skill in positioning the skull and related anatomy. This course continues the discussion of professional behaviors and ethics, respect and empathy in handling patients from diverse backgrounds, radiation safety, and image critique and processing. Level I Prerequisite: Academic Reading and Writing Levels of 6; RAD 150 minimum grade "C-"

**RAD 218 Radiation Biology and Protection (3 Credits)**

RAD

In this course, students will learn the principles of radiobiology and radiation protection. Students will analyze the basic theories of the biological, genetic and somatic effects of radiation on human cells and tissue and learn the current radiation protection standards and practices used in the healthcare setting to protect themselves, patients and others from exposure to radiation. Level I Prerequisite: Academic Reading and Writing Levels of 6; RAD 120 minimum grade "C-"

**RAD 222 Pharmacology in Diagnostic Imaging (2 Credits)**

RAD

In this course, students are introduced to pharmacology and contrast media administration as it relates to the medical imaging profession. Students will gain an understanding of diagnostic contrast media and the effects of these agents on the human body. They will also receive instruction in basic techniques of venipuncture, appropriate patient care practices during drug administration and management of medical emergencies in the diagnostic imaging department. Level I Prerequisite: Academic Reading and Writing Levels of 6; RAD 150 minimum grade "C-", may enroll concurrently

**RAD 223 Sectional Anatomy (2 Credits)**

RAD

This course will present an introduction to sectional anatomy. Students will learn to identify anatomic structures of the human body from computed tomography and MRI sectional images presented in axial, coronal, and sagittal planes and analyze the special relationship of these structures. The sectional anatomy of the head, neck, chest, abdomen, pelvis, spine and joints will be studied. Level I Prerequisite: Academic Reading and Writing Levels of 6; RAD 217 minimum grade "C-"

**RAD 225 Clinical Education (3 Credits)**

RAD

This course provides continued structured clinical experience in the application of knowledge and skills for positioning the upper and lower extremities, chest, abdomen, spinal column and skull during contrast studies, surgical procedures and portable radiography. Students will demonstrate their mastery in the design and operational characteristics of equipment and accessories in diagnostic radiography. Level I Prerequisite: Academic Reading and Writing Levels of 6; RAD 217 minimum grade "C"

**RAD 232 Digital Imaging in Radiography (2 Credits)**

RAD

In this course, students are introduced to the physical principles of digital radiography imaging systems. Topics include digital image acquisition processing, the effective use of exposure factors for digital image receptors (computed radiography and flat-panel digital radiography), imaging physics of digital fluoroscopy and mammography, and quality control for digital radiographic equipment. The principles of image display, archiving, and retrieval commonly used for Picture Archiving Communication Systems (PACS) will also be presented. Level I Prerequisite: Academic Reading and Writing Levels of 6; RAD 190 minimum grade "C-"

**RAD 235 Pathology for Radiographers (3 Credits)**

RAD

This course is a study of pathological imaging to include respiratory, gastrointestinal and accessory organs, genitourinary, skeletal, cardiovascular, and nervous systems. This course will investigate the etiology, signs, symptoms, and primary methods of diagnosis. An emphasis is placed on radiologic visualization of pathological conditions. This course was previously RAD 135. Level I Prerequisite: Academic Reading and Writing Levels of 6; RAD 150 minimum grade "C-"

**RAD 240 Clinical Education (2 Credits)**

RAD

This course provides structured clinical experience in the application of knowledge and skill in positioning the chest and thorax, abdomen, spinal column, skull, upper and lower extremities and related anatomy while working in general, portable and fluoroscopic radiography. The course also provides students with an opportunity to learn and demonstrate professional ethics, courtesy and empathy in handling patients, radiation safety, film processing/imaging plate (IP) handling and image archiving and radiographic equipment manipulation. Level I Prerequisite: Academic Reading and Writing Levels of 6; RAD 225 minimum grade "C-"

**RAD 259 Introduction to Computed Tomography (CT) Instrumentation and Protocols (1 Credit)**

RAD

This is a course for certified technologists, ARRT (R), ARRT (N), ARRT (T), and (CNMT), who are admitted to the computed tomography (CT) program. An overview of the major components of a computed tomography (CT) scanner, how they work, their function, and the technologists interface with them, and the basic scanning protocols common to CT imaging will be presented. Level I Prerequisite: Academic Reading and Writing Levels of 6; Admission to Computed Tomography (CT) program

**RAD 261 Patient Care in Computed Tomography (CT) (1 Credit)**

RAD

In this course, students will learn the theory and practice of the basic techniques of venipuncture and the administration of contrast media for computed tomography (CT) procedures. Other topics include patient education and care, uses of and contraindications for contrasting media, and responding to medical emergencies during computed tomography (CT) procedures. This is a course for certified technologists, ARRT (R), ARRT (N), ARRT (T), and (CNMT), who are admitted to the computed tomography (CT) program. Level I Prerequisite: Academic Reading and Writing Levels of 6; Admission to Computed Tomography (CT) program

**RAD 262 Principles of Computed Tomography (CT) (2 Credits)**

RAD

This is a course for certified technologists, ARRT (R), ARRT (N), ARRT (T), and (CNMT), who are admitted to the computed tomography (CT) program. The history of computed tomography, equipment design and function, and the basic fundamentals of CT scanning will be presented. Level I Prerequisite: Academic Reading and Writing Levels of 6; Admission to Computed Tomography (CT) program

**RAD 263 Practical Computed Tomography (CT) Imaging (3 Credits)**

RAD

In this course, students will learn computed tomography (CT) scanning procedures and protocol techniques. Students will learn how to identify important cross-sectional anatomy pertinent to the CT field, along with common pathologies. This is a course for certified technologists, ARRT (R), ARRT (N), ARRT (T), and (CNMT), who are admitted to the computed tomography (CT) program. Level I Prerequisite: Academic Reading and Writing Levels of 6; Admission to Computed Tomography (CT) program; RAD 259 and RAD 261, minimum grade "C"; may enroll concurrently in both courses

**RAD 265 Computed Tomography (CT) Clinical Education I (3 Credits)**

RAD

This is the first clinical course for certified technologists, ARRT (R), ARRT (N), ARRT (T), and (CNMT), who are admitted to the computed tomography (CT) program. Students will apply knowledge and skills learned in the classroom to the performance of computed tomography (CT) procedures in the clinical setting. Students are expected to gain practical experience and demonstrate competency in the area of CT protocols and parameter, equipment operation, quality control, and image critique. This course requires a 15 week, 24-hours/week clinical rotation under the supervision of a certified computed tomographer. Level I Prerequisite: Academic Reading and Writing Levels of 6; Admission to Computed Tomography (CT) program

**Corequisites:** RAD 263**RAD 266 Advanced Computed Tomography (CT) Imaging (3 Credits)**

RAD

This is a course for certified technologists, ARRT (R), ARRT (N), ARRT (T), and (CNMT), who are admitted to the computed tomography (CT) program. Advanced computed tomography (CT) techniques, including the principles and application of 3D imaging will be discussed. Level I Prerequisite: Academic Reading and Writing Levels of 6; RAD 265 minimum grade "C"

**RAD 267 Computed Tomography (CT) Clinical Education II (3 Credits)**

RAD

This is the second clinical course for certified technologists, ARRT (R), ARRT (N), ARRT (T), and (CNMT), who are admitted to the computed tomography (CT) program. Students will complete all documentation and competency training necessary to sit for the American Registry of Radiologic Technologists (ARRT) computed tomography certification examination. Students will be assigned to a health care facility for 15 weeks, 24 hours/week (360 clinical hours), under the supervision of a certified technologist. Level I Prerequisite: Academic Reading and Writing Levels of 6; RAD 265 minimum grade "C"

**RAD 270 Principles of Mammography (3 Credits)**

RAD

This is the first course in the mammography program for certified radiologic technologists. The history of mammography and a comprehensive review of breast anatomy, physiology, mammographic positioning protocols, specialized mammographic procedures and breast pathology will be presented. Level I Prerequisite: Academic Reading and Writing Levels of 6; Admission to Mammography program

**RAD 271 Mammography Quality Control (QC) (3 Credits)**

RAD

This is the second course in the mammography program for certified radiologic technologists. Topics include the Mammography Quality Standards Act (MQSA), mammography equipment, quality assurance/quality control of digital mammography imaging systems, advanced breast imaging modalities, and breast cancer treatment options. Level I Prerequisite: Academic Reading and Writing Levels of 6; Admission to Mammography program; RAD 270 minimum grade "C", may enroll concurrently

**Corequisites:** RAD 273**RAD 273 Mammography Clinical Education (3 Credits)**

RAD

In this course, the certified radiologic technologist receives a structured and supervised clinical experience. Students will apply knowledge and skills learned in the classroom to the performance of mammographic examinations. Students are expected to gain practical experience and demonstrate competency in the area of patient positioning, breast examination, equipment operation, quality control, and image critique. Students will be assigned to a health care facility for 15 weeks, 24 hours/week, under the supervision of a certified mammographer. Level I Prerequisite: Academic Reading and Writing Levels of 6; Admission to Mammography program; RAD 270 minimum grade "C", may enroll concurrently

**Corequisites:** RAD 271