RADT-RADIOLOGIC TECHNOLOGY (RADT)

RADT 1115. Fundamentals of Radiographic Imaging
2 Credits (2)
This course provides students with an in-depth knowledge of radiographic exposure techniques and the factors affecting radiographic image quality. It covers digital imaging with related accessories and emphasizes radiographic critique for diagnostic quality control. Additionally, the course reinforces radiologic fundamentals, introducing instrumentation and technology used in digital imaging. Topics include capturing, processing, displaying, and managing digital images, as well as exposure techniques and exposure indicators. Laboratory activities provided to reinforce radiographic concepts.
Learning Outcomes
1. Explain the principles of radiation production, image formation, and digital imaging systems.
2. Demonstrate proper techniques for exposure selection, scatter control, and radiation protection.
3. Compare radiographic digital imaging systems, assessing their advantages and limitations.
4. Evaluate radiographic images for technical accuracy and apply necessary adjustments.
5. Apply quality control measures and automatic exposure control to ensure optimal imaging outcomes.

RADT 1130L. Introduction to Radiographic Imaging Applied Clinic Skills
1 Credit (3P)
Applied clinical skills Laboratory to provide the student with an in-depth knowledge of radiographic exposure technique and the factors affecting radiographic image quality.
Corequisite: RADT 1115.
Learning Outcomes
1. Demonstrate techniques for radiographic scatter control and grid utilization.
2. Apply exposure selection principles.
3. Analyze and utilize automatic exposure control in imaging.
4. Assess radiographic images for technical accuracy and make necessary adjustments.
5. Apply radiation protection methods for patients and personnel.
6. Utilize radiographic equipment and apply quality control measures.

RADT 1140. Radiographic Positioning I
2 Credits (2)
This course covers the fundamental principles and techniques of diagnostic radiography, including radiographic procedures, patient positioning, terminology, and the mechanics of image production. Students will learn and apply these concepts to the upper and lower extremities, chest, abdomen, and pelvis/hip. The course emphasizes radiographic anatomy, particularly osteology and arthrology, as it relates to routine radiographic procedures.
Learning Outcomes
1. Master radiographic terminology related to positioning, projection, anatomy, medical abbreviations, positioning aids, accessory equipment, and lead markers, explaining their function and application.
2. Evaluate patient care considerations.
3. Explain the basic principles of radiation protection.
4. Describe the basic principles of image acquisition, display, and standards, including common errors, appearance characteristics, procedural factors, and corrective actions.
5. Evaluate orders, requests, and diagnostic reports.

RADT 1140L. Radiographic Positioning I Laboratory
1 Credit (3P)
Applied clinical skills Laboratory in radiographic procedures and positioning concepts, techniques, terminology, and mechanics related to upper and lower extremities, chest, abdomen and pelvis/hip.
Corequisite: RADT 1140.
Learning Outcomes
1. Apply knowledge of radiographic procedures, including routine and special views, to clinical simulations for the chest, abdomen, and upper and lower extremities.
2. Demonstrating understanding of positioning considerations.
3. Analyze radiographic images.
4. Apply the basic principles of radiation protection.
5. Apply basic principles of image acquisition, display, and standards, considering common errors, appearance characteristics, procedural factors, and corrective actions.

RADT 1150. Radiographic Positioning II
2 Credits (2)
Continuation of Radiographic Positioning I including a study of the osteology and arthrology of the thorax, vertebral column, skull, facial bones, and sinuses. Discussion and demonstration of the related standard and special radiographic projections resents the fundamentals of radiographic anatomy, positioning, and terminology used in routine fluoroscopic procedures of the gastrointestinal and genitourinary tract with discussion and demonstration of the related radiographic projections.
Prerequisite: RADT 1140.
Learning Outcomes
1. Identify preparation and positioning aides for Radiological Procedures.
2. Identify evaluation criteria to determine acceptable radiographs.
3. Identify anatomy and physiology for Radiological Procedures.
4. Show use of patient care and radiation protection practices in Radiological Procedures.

RADT 1150L. Radiographic Positioning II Laboratory
1 Credit (3P)
Continuation of Radiographic Positioning I. Applied Clinical Skills Laboratory: Includes vertebral column, skull, facial bones, sinuses, gastrointestinal, urinary, and fluroscopic procedures.
Corequisite: RADT 1150.
Learning Outcomes
1. Model knowledge of radiographic procedures, including routine floroscopic procedures.
2. Evaluate positioning considerations.
3. Demonstrate Radiological Procedures and apply proper patient position and CR placement to obtain proper evaluation criteria.

RADT 1154. Radiographic Anatomy and Physiology
3 Credits (3)
Basic A&P for radiographic application. Includes a systems approach to body structures and organs as they relate to anatomical projections, radiographic identification, and various imaging modalities.
Prerequisite: C- or above in the following courses AHS 153 or AHS 140 or BIOL 2210 or BIOL 1130, or consent of instructor.

Learning Outcomes

1. Identify and Laboratoryel the anatomy associated with diagnostic X-ray images.
2. Critique x-ray images for the presence or absence of anatomy in deciding whether the x-ray is appropriately positioned and diagnostic for radiologist assessment.
3. Locate anatomical systems based on background knowledge of typical anatomical locations and identify normal course of system function for appropriate positioning, patient instructions, and x-ray imaging.
4. Apply knowledge in a testing environment mimicking what is expected for the ARRT Registry.

RADT 1175. Introduction to Radiologic Technology and Patient Care
3 Credits (3)

This course provides a foundational overview of the radiology profession, encompassing basic patient care skills, professional standards, and ethical/legal principles. Students will learn essential skills such as patient transportation, vital sign assessment, and effective communication, while also being introduced to specific radiographic patient care techniques including history taking, immobilization, managing medical emergencies, and the administration of contrast media and radiopharmaceuticals. Additionally, the course will cover core concepts of radiation protection, and basic and specialized procedures, all within the framework of professional ethics and terminology.

Learning Outcomes

1. Demonstrate a working knowledge of medical terminology, procedures, and the roles of various healthcare professionals, including those specializing in medical imaging and radiologic sciences.
2. Critically analyze medical reports, orders, and requests, applying evidence-based practices to inform patient care decisions.
3. Evaluate patient health status using vital signs, Laboratory tests, pain assessments, and patient records, and respond appropriately to medical emergencies and traumatic injuries.
4. Implement infection control protocols, utilizing appropriate procedures, equipment, and knowledge of infectious pathogens.
5. Explain drug classifications, administration routes, safety practices, and the use of contrast agents in radiography.
6. Apply ethical principles and legal considerations to healthcare scenarios, including informed consent and navigating ethically complex situations.
7. Exhibit professional behavior in healthcare settings, demonstrating effective communication, cultural sensitivity, and an understanding of the psychological aspects of patient care.

RADT 1190. CT Equipment and Methodology
3 Credits (3)

Skill development in the operation of computed tomographic equipment, focusing on routine protocols, image quality, and quality assurance and radiation protection.

Learning Outcomes

1. Demonstrate acquisition of comprehensive technical knowledge by obtaining a seventy-five percent or greater on all quizzes and exam assessments (this is in alignment with the scoring expectations for the national registry exam).
2. Manipulate and choose the appropriate scan parameters and technical factors on CT equipment while applying the technical science supporting the decision.
3. Demonstrate appropriate use of post-processing options and provide diagnostic quality images.
4. Abide by radiation safety and dosimetry standards for patient care by demonstrating ALARA standards.
5. Select CT scan manipulations for optimal demonstration of anatomic region, according to protocol (delayed imaging, multiplanar reconstructions, filters) and with safe use of iodinated contrast mediums.
6. Recognize and reduce factors that may inhibit diagnostic image quality.

RADT 1191. Computed Tomography (CT) Imaging and Equipment
4 Credits (4)

This course serves as an introduction to computed tomography (CT) for current radiologic technology students. Course will include information on clinical equipment and application of x-rays in CT, CT image formation, evaluation, and archiving, patient radiation safety and dose, and patient interactions and management for imaging.

Learning Outcomes

1. Demonstrate acquisition of comprehensive technical knowledge by obtaining a seventy-five percent or greater on all quizzes and exam assessments (this is in alignment with the scoring expectations for the national registry exam).
2. Identify critical components of CT system equipment and what their purposes are in creating a CT image.
3. Identify CT parameters which allow for safely administering radiation dose; particularly to pediatric patients.
4. List and define the steps required to acquire a CT image, including the theory behind x-ray interaction/absorption/ attenuation, detector capabilities, appropriate reconstruction options, and computer equipment.
5. Identify image display functions and radiology informatic options.
6. Identify the major technical components of image display in CT and common artifacts, including how to reduce artifacts.

RADT 1520. Radiation Biology and Protection
2 Credits (2)

This course explores the biological effects of ionizing radiation on human cells and tissues, including genetic, somatic, short-term, and long-term effects. It covers radiation measurements, policies, and protection measures for technologists, patients, and others, emphasizing minimizing exposure and basic protection methods. The course also reviews current regulations and recommendations by the NRCP and ICRP.
Prerequisite: C- or above in RADT 1115.

Learning Outcomes

1. Radiobiology: Explain fundamental principles, molecular/cellular aspects, early/late radiation effects, and related regulations/ terminology.
2. Radiation Protection: Describe health physics, protection design, and patient/personnel dose management, including methods to limit radiation exposure.
3. Human Biology Ionization: Discuss relevant aspects of human biology and the consequences of ionization in human cells.
4. Cellular Response to Radiation: Examine factors affecting cell radiosensitivity, direct/indirect effects of radiation, dose-response relationships, and the significance of LD50/30 and LD50/60 radiation.

RADT 1811. Radiographic Positioning I Clinical Experience
1 Credit (4P)

Introduction to the clinical environment. Students will complete administrative duties, perform basic diagnostic radiography exams and provide patient care under the direct/indirect supervision of a qualified registered radiologic technologist as required and assigned.
Corequisite: RADT 1140.

Learning Outcomes

1. Demonstrate the ability to safely produce diagnostic radiographic images.
2. Appropriately position patients, identify radiographic anatomy and pathological conditions.

RADT 1812. Radiographic Positioning II Clinical Experience
1 Credit (4P)
Clinical Experience: Students will complete administrative duties, perform diagnostic radiography exams, and provide patient care under the direct/indirect supervision of a qualified registered radiologic technologist as required and assigned.
Corequisite: RADT 1150.

Learning Outcomes

1. Demonstrate the ability to safely produce diagnostic radiographic images.
2. Appropriately position patients, identify radiographic anatomy and pathological conditions.
3. Model effective communication skills.

RADT 1997. Radiologic Technology Independent Study
1-6 Credits (1-6)
Varies. May be repeated up to 6 credits.

Learning Outcomes

1. Varies.

RADT 2250. Radiographic Image Critique
2 Credits (2)
This course reviews radiographs, evaluating anatomy and technical quality, including positioning and technique. Students learn to make adjustments and reinforce concepts through classroom activities.
Prerequisite: RADT 2811.

Learning Outcomes

1. Optimal Projections Labeling: State key components of optimal projections, properly display body structures, and accurately Laboratoryel projections using markers and annotations.
2. Comprehensive Imaging Knowledge: For all major body regions (chest, abdomen, extremities, pelvis, shoulder girdle, bony thorax, spine, skull): identify anatomy, state technical data, identify positioning errors, describe considerations for special conditions (air-fluid levels, motion, pathology), and discuss adaptive techniques.
3. Digital Imaging: Demonstrate familiarity with digital image acquisition, errors, and display.
4. Image Analysis: Perform image analysis, including appearance standards, characteristics, procedural factors, and corrective actions.

RADT 2404. Radiographic Special Modalities
3 Credits (3)
Introduction and discussion of various special procedures and modalities including but not limited to: interventional radiography, computed tomography, magnetic resonance imaging, nuclear medicine, radiation therapy, ultrasound.
Prerequisite: RADT 1115.

Learning Outcomes

1. Attain basic knowledge of the various imaging modalities and differentiate between images produced by those modalities.
2. Explain general equipment requirements.
3. Identify various contrast agents used by different modalities and define potential contraindications.
4. Explain the use of artificial intelligence for the various modalities.

RADT 2408. Radiographic Pathology
3 Credits (3)
This course explores the pathology of major body systems and corresponding radiographic imaging techniques. Students learn about disease processes (etiology, signs/symptoms, diagnosis, and treatment) and identify pathological signs on various images, emphasizing radiography. Fundamental anatomy and physiology are integrated, focusing on anatomical projections, radiographic identification, and imaging modalities (including CT and MRI).
Prerequisite: RADT 1154.

Learning Outcomes

1. Describe and identify anatomical structures on diagrams and radiographs.
2. Classify and explain pathological conditions affecting major body systems.
3. Identify pathologies, assess radiographic appearance, and evaluate imaging accuracy.
4. Define key terms, use medical abbreviations, and understand diagnostic reports.
5. Position patients correctly, assess images, and apply technical adjustments.
6. Identify radiation types, effects, and imaging modalities for diagnosis and treatment.
7. Critique images, locate pathology, and demonstrate readiness for certification exams.

RADT 2410. Radiographic Physics and Equipment
3 Credits (3)
This course offers a comprehensive exploration of the physical principles of diagnostic radiography, covering radiologic physics, imaging theory, and quality assurance. Students will examine atomic structure, electromagnetism, X-ray production and interaction, exposure factors, scatter control, and image characteristics. The curriculum also includes digital fluoroscopy, X-ray circuitry, and an introduction to advanced imaging modalities such as mammography, CT, and MRI.
Prerequisite/Corequisite: C- or above in RADT 1115.

Learning Outcomes

1. Explain the structure of atoms and types of radiation.
2. Describe X-ray production and factors affecting image quality.
3. Explain photon interactions with matter.
4. Identify key components of the X-ray circuit and X-ray tube.
5. Apply physics and math principles to radiographic procedures and equipment.
6. Analyze radiographic images for accuracy and quality.

RADT 2811. Clinical Experience I
4 Credits (4P)
Clinical Experience: Students will complete administrative duties, perform diagnostic radiography exams, and provide patient care under the direct/indirect supervision of a qualified registered radiologic technologist as required and assigned.
Prerequisite: RADT 2410.

Learning Outcomes

1. Demonstrate the ability to safely produce diagnostic radiographic images.

2. Appropriately position patients, identify radiographic anatomy and pathological conditions.
3. Demonstrate effective communication skills.
4. Accurately document/record data in accordance with clinical site policies and procedures.

RADT 2812. Clinical Experience II
6 Credits (6P)
Clinical Experience: Students will complete administrative duties, perform diagnostic radiograph exams, and provide patient care under direct/indirect supervision of a qualified registered radiologic technologist as assigned. Evening/weekend, CT, and OR rotations will be offered where available.
Prerequisite: RADT 2811.
Learning Outcomes
1. Demonstrate the ability to safely produce diagnostic radiographic images.
2. Appropriately position patients, identify radiographic anatomy and pathological conditions.
3. Demonstrate effective communication skills.
4. Accurately document/record data in accordance with clinical site policies and procedures.
5. Demonstrate the ability to use independent judgement.
6. Analyze radiographic images for technical and positioning accuracy to make modifications as needed.
7. Conduct themselves in a professional manner to function effectively as a member of the healthcare team.

RADT 2813. Clinical Experience III
3 Credits (3P)
Clinical Experience: Students will complete administrative duties, perform diagnostic radiography exams, and provide patient care under the direct/indirect supervision of a qualified registered radiologic technologist as required and assigned. Evening/weekend, CT and OR rotations will be offered where available.
Prerequisite: C- or above in RADT 2812.
Learning Outcomes
1. Students will demonstrate the ability to safely produce diagnostic radiographic images.
2. Be able to position patients and identify radiographic anatomy and pathological conditions.
3. Demonstrate effective communication skills.
4. Accurately document/record data in accordance with clinical site policies and procedures.
5. Demonstrate the ability to use independent judgement.
6. Analyze radiographic images for technical and positioning accuracy to make modifications as needed.
7. Conduct themselves in a professional manner to function effectively as a member of the healthcare team.
8. Identify opportunities for professional growth within medical imaging sciences.

RADT 2814. Special Modalities Clinical Experience IV
3 Credits (3P)
Clinical Experience: Special rotations in advanced imaging modalities to include but are not limited to nuclear medicine, sonography, mammography, MRI, CT, interventional radiology, and cardiac catheterization Laboratory.
Corequisite: C- or above in RADT 2404.
Learning Outcomes
1. Identify, compare, and evaluate various specialized modalities in medical imaging, including but not limited to Computed Tomography (CT), Magnetic Resonance Imaging (MRI), Ultrasound, Nuclear Medicine, and Interventional Radiology.
2. Demonstrate principles, applications, and patient care considerations associated with each modality, as well as the role of advanced imaging in diagnosis and treatment within the healthcare setting.
3. Demonstrate effective communication skills.
4. Conduct themselves in a professional manner to function effectively as a member of the healthcare team.
5. Identify various opportunities for professional growth within medical imaging sciences.
6. Develop and refine professional job-seeking skills, including crafting an effective resume and cover letter, preparing for interviews, and demonstrating workplace professionalism.

RADT 2817. Cross Sectional Anatomy for Medical Imaging
3 Credits (3)
Anatomic relationships that are present under various sectional orientations as depicted by computed tomography or magnetic resonance imaging.
Learning Outcomes
1. Identify and Laboratoryel the anatomy associated with the topical outline in diagnostic CT images.
2. Critique CT images for the presence or absence of anatomy and pathology in deciding whether the image is appropriately positioned and diagnostic for radiologist assessment.
3. Locate anatomical systems and possible pathology based on background knowledge of typical anatomical locations and identify normal course of system function for appropriate positioning, patient instructions, and CT imaging.

RADT 2818. Clinical Experience I (Computed Tomography)
2 Credits (2P)
A basic, introductory health-related, work-based learning experience that enables students to apply specialized occupational theory, skills, and concepts. The clinic professional provides direct supervision.
Learning Outcomes
1. Complete at least 55 high-quality CT scans while maintaining good standing.
2. Engage appropriately with patients using verbal and nonverbal communication at a beginner level.
3. Identify necessary Laboratory values for contrast-enhanced CT exams at a beginner level.
4. Evaluate personal/occupational radiation exposure and explain CT dose measurement.
5. Use post-processing tools to produce diagnostic-quality images and adjust CT parameters for optimal imaging and contrast.

RADT 2819. Clinical Experience II (Computed Tomography)
2 Credits (2P)
An intermediate health-related work-based learning experience that enables students to apply specialized occupational theory, skills, and concepts. The clinic professional provides direct supervision.
Learning Outcomes
1. Complete at least 100 high-quality CT scans while maintaining good standing.
2. Engage appropriately with patients using verbal and nonverbal communication.

3. Identify necessary Laboratory values for contrast-enhanced CT exams.
4. Evaluate personal/occupational radiation exposure and explain CT dose measurement.
5. Use post-processing tools to produce diagnostic-quality images and adjust CT parameters for optimal imaging and contrast safety.

RADT 2820. Clinical Experience III (Computed Tomography)
2 Credits (2P)
Advanced health-related work-based learning experience that enables the student to apply specialized occupational theory, skills and concepts. Direct supervision is provided by the clinic professional. Upon completion, students will be able to assume most of the duties of an experienced imaging professional in Computed Tomography.
Prerequisite: RADT 2819.
Learning Outcomes
1. Complete at least 125 high-quality CT scans while maintaining good standing.
2. Engage appropriately with patients using verbal and nonverbal communication.
3. Identify necessary Laboratory values for contrast-enhanced CT exams.
4. Evaluate personal/occupational radiation exposure and explain CT dose measurement.
5. Use post-processing tools to produce diagnostic-quality images and adjust CT parameters for optimal imaging and contrast safety.

RADT 2999. Radiologic Technology Capstone
3 Credits (3)
Varies.
Prerequisite: RADT 2812.
Learning Outcomes
1. Varies.