**Medical Radiography (RADT)**

**RADT 1010. Intro to Radiography. 2 Hours.**
Open to all students interested in medical radiography. Explores the field of radiography and its role in health care delivery. Covers fundamental concepts including medical terminology, radiation protection, ethics, career opportunities, professional development, and hospital operations. This course requires a Differential Tuition Rate which is an additional fee of $60 charged per credit hour. **COURSE LEARNING OUTCOMES (CLOs) At the successful conclusion of this course, students will be able to:**

1. Identify strategies used to become a successful student radiographer.
2. Describe the roles and responsibilities of a radiographer.
3. Discuss the importance of professional ethics in the profession of a radiologic technologist.
4. Describe basic radiation protection techniques used by radiographers.
5. Discuss the fundamental process of x-ray production. FA, SP.

**RADT 1020. Radiographic Procedures I. 5 Hours.**
First semester course. Instruction in how to perform radiographic procedures and identifying anatomy of the upper/lower extremities, chest, abdomen, bony thorax and pelvis with emphasis on radiation protection, surface landmarks and pathology. Image analysis is introduced. Taught in cohort rotation. This course requires a Differential Tuition Rate which is an additional fee of $60 charged per credit hour. **COURSE LEARNING OUTCOMES (CLOs) At the successful conclusion of this course, students will be able to:**

1. Identify and explain the function of the major components of the x-ray tube.
2. Identify and analyze the various components of radiographic quality.
3. Analyze the relationship of factors that control and affect radiographic contrast.
4. Apply conversion factors for changes in the following areas: distance, grid, mAs, reciprocity and the 15% rule.
5. Summarize the relationships of factors affecting scattered and secondary radiation. Prerequisite: Admission to the Utah Tech University Medical Radiography program.

**RADT 1030. Radiographic Imaging I. 3 Hours.**
First semester course. Analysis of factors affecting image quality and application of radiographic principles using imaging devices such as image receptors, grids and beam limiting devices, processing procedures, as well as introduction of basic digital imaging concepts. Taught in cohort rotation. This course requires a Differential Tuition Rate which is an additional fee of $60 charged per credit hour. **COURSE LEARNING OUTCOMES (CLOs) At the successful conclusion of this course, students will be able to:**

1. Demonstrate ability to manipulate the x-ray tube, table and console.
2. Identify anatomy on a diagram or radiograph.
3. Demonstrate correct positioning for procedures covered in the course.
4. Describe and utilize patient exposure minimization techniques.
5. Explain radiographic procedures and give appropriate directions when simulating radiographic procedures. Course fee required. Prerequisites: Admission to the Utah Tech University Medical Radiography program.

**RADT 1040. Clinical Education I (ALPP). 4 Hours.**
First Semester Course. Students will apply theories and develop skills in a supervised setting through observation, assisting, and performing basic radiographic procedures on upper/lower extremities, chest, abdomen, pelvis and bony thorax. 180 clinical hours. Taught in cohort rotation. This course is designated as an Active Learning Professional Practice (ALPP) course. This course allows students to explore and apply content learned in the course in a professional experience away from the classroom. This course requires a Differential Tuition Rate which is an additional fee of $60 charged per credit hour. **COURSE LEARNING OUTCOMES (CLOs) At the successful conclusion of this course, students will be able to:**

1. Perform and/or assist with radiographic procedures appropriate to student’s level of skill and knowledge.
2. Evaluate patient’s status and condition before, during and following the radiologic procedure.
3. Apply good communication skills with patients, support staff and technologist.
4. Distinguish between acceptable and unacceptable radiographic images.
5. Apply principles of ALARA to minimize exposure to patient, self and others. Prerequisite: Admission to the Utah Tech University Medical Radiography program.

**RADT 1050. Patient Care. 2 Hours.**
First semester course. Introduces the role of the radiographer as a health care provider. Topics include patient communication and education, patient transfer, vital signs, infection control, oxygen, suction, age-specific needs and cultural diversity. Taught in cohort rotation. This course requires a Differential Tuition Rate which is an additional fee of $60 charged per credit hour. **COURSE LEARNING OUTCOMES (CLOs) At the successful conclusion of this course, students will be able to:**

1. Demonstrate ability to manipulate the x-ray tube, table and console.
2. Identify anatomy on a diagram or radiograph.
3. Demonstrate correct positioning for procedures covered in the course.
4. Describe and utilize patient exposure minimization techniques.
5. Explain radiographic procedures and give appropriate directions when simulating radiographic procedures. Course fee required. Prerequisites: Admission to the Utah Tech University Medical Radiography program.

**RADT 1120. Radiographic Procedures II. 4 Hours.**
Second Semester Course. Instruction in performing radiographic procedures and identifying anatomy of the vertebral column, genitourinary, gastrointestinal and biliary systems, skull and facial bones, as well as advanced mobile and surgical procedures, composition and the use and effects of contrast media. Taught in cohort rotation. This course requires a Differential Tuition Rate which is an additional fee of $60 charged per credit hour. **COURSE LEARNING OUTCOMES (CLOs) At the successful conclusion of this course, students will be able to:**

1. Apply correct positioning for various exams in simulated lab demonstrations.
2. Explain and practice appropriate radiation protection required for personnel when performing mobile and fluoroscopic exams.
3. Modify radiographic positioning to accommodate patient restrictions in mobility.
4. Describe and demonstrate projections/positions used in trauma situations.
5. Identify standard radiographic positions and anatomical structures on a radiographic image. Course fee required. Prerequisites: Admission to the Utah Tech University Medical Radiography program. SP.
RADT 1140. Clinical Education II (ALPP). 5 Hours.
Second Semester Course. Continuation of RADT 1040, providing students with the opportunity to apply theories and further develop technical skills with emphasis placed on vertebral column, biliary system, gastrointestinal and genitourinary procedures, skull and facial bones. Patient management specific to fluoroscopic and advanced radiographic procedures. 225 clinical hours. Taught in cohort rotation. This course is designated as an Active Learning Professional Practice (ALPP) course. This course allows students to explore and apply content learned in the course in a professional experience away from the classroom. This course requires a Differential Tuition Rate which is an additional fee of $60 charged per credit hour. **COURSE LEARNING OUTCOMES (CLOs) At the successful conclusion of this course, students will be able to: 1. Demonstrate competency in routine radiographic procedures. 2. Apply technical exposure factors to equipment specifications to meet the ALARA principle. 3. Use effective communication skills with patients, support staff, and technologist. 4. Evaluate procedure orders for accuracy, and follow-up with corrective changes when applicable. 5. Distinguish between acceptable and unacceptable radiographic images. Course fee required. Prerequisites: Admission to the Utah Tech University Medical Radiography program. SP.

RADT 1230. Radiographic Imaging II. 2 Hours.
Second Semester Course. Builds on theories and concepts introduced in RADT 1030, emphasizing quality assurance and quality control, digital and computed imaging components and processes and data and information management with PACS. Taught in cohort rotation. This course requires a Differential Tuition Rate which is an additional fee of $60 charged per credit hour. **COURSE LEARNING OUTCOMES (CLOs) At the successful conclusion of this course, students will be able to: 1. List benefits of a quality management program to the patient and department. 2. Explain the importance of repeat analysis programs in quality management. 3. Relate receptor exposure indicator values to technical factors, system calibration, part/beam/receptor alignment and patient exposure. 4. Describe various image processing employed for digital imaging. 5. Examine potential impact of digital radiography on patient exposure and methods of practicing ALARA with digital systems. Prerequisite: Admission to the Utah Tech University Medical Radiography program.

RADT 1240. Clinical Education III (ALPP). 7 Hours.
Third semester course. Continuation of RADT 1140, providing students with the opportunity to apply theories and further develop technical skills. Students will gain experience in patient and time management specific to advanced radiographic procedures. 315 clinical hours. Taught in cohort rotation. This course is designated as an Active Learning Professional Practice (ALPP) course. This course allows students to explore and apply content learned in the course in a professional experience away from the classroom. This course requires a Differential Tuition Rate which is an additional fee of $60 charged per credit hour. **COURSE LEARNING OUTCOMES (CLOs) At the successful conclusion of this course, students will be able to: 1. Demonstrate continued proficiency in areas of previously completed competency testing. 2. Perform competencies with an 85% or better. 3. Determine technical exposure factors. Utilizes technical factors according to equipment specifications to meet the ALARA principle. 4. Adapt to changes and varying clinical situations as well as modifying positioning for non-routine (trauma) procedures. 5. Manage time to effectively complete inpatients, outpatients and ER exams with a limited number of staff technologists. Course fee required. Prerequisite: Admission to the Utah Tech University Medical Radiography program.

RADT 1250. Advanced Patient Care. 2 Hours.
Second semester course. Instruction in advanced patient care skills, including pharmacology and contrast administration for medical imaging, medical ethics and law, and mobile and surgical radiography. Taught in cohort rotation. This course requires a Differential Tuition Rate which is an additional fee of $60 charged per credit hour. **COURSE LEARNING OUTCOMES (CLOs) At the successful conclusion of this course, students will be able to: 1. Explain the role of ethical behavior in health care delivery. 2. Explain specific legal terms, principles and law. 3. Demonstrate correct technique in performing venipuncture using standard precautions. 4. Describe unique problems faced in performing procedures on a patient with specific tubes, drains and catheters. 5. Recognize common pathologies on various images. Prerequisite: Admission to the Utah Tech University Medical Radiography program.

RADT 2030. Radiographic Physics. 3 Hours.
Fourth semester course. In depth analysis of electrical circuitry, transformers, and rectifiers as they relate to x-ray production, as well as construction and function of the x-ray tube, fluoroscopic systems, video systems, AEC, and digital imaging. Taught in cohort rotation. This course requires a Differential Tuition Rate which is an additional fee of $60 charged per credit hour. **COURSE LEARNING OUTCOMES (CLOs) At the successful conclusion of this course, students will be able to: 1. Identify general components and functions of the tube and filament circuits. 2. Demonstrate protocols used to extend x-ray tube life. 3. Discuss ways in which x-ray photons are created. 4. Describe the x-ray emission spectrum and factors that affect it. 5. Explain image-intensified and digital fluoroscopic image formation. Prerequisite: Admission to the Utah Tech University Medical Radiography program.

RADT 2040. Clinical Education IV (ALPP). 7 Hours.
Fourth semester course. Continuation of RADT 1240 with emphasis on mastering basic procedures and attaining experience in advanced procedures with further awareness of radiation protection requirements. Students will rotate through advanced modality areas as assigned by Clinical Coordinator. 315 clinical hours. Taught in cohort rotation. This course is designated as an Active Learning Professional Practice (ALPP) course. This course allows students to explore and apply content learned in the course in a professional experience away from the classroom. This course requires a Differential Tuition Rate which is an additional fee of $60 charged per credit hour. **COURSE LEARNING OUTCOMES (CLOs) At the successful conclusion of this course, students will be able to: 1. Demonstrate continued proficiency in areas of previously completed competency testing. 2. Apply principles of ALARA to minimize exposure to patient, self and others. 3. Distinguish between acceptable and unacceptable radiographic images. 4. Recognize the importance of various modalities within radiology and the different aspects of patient care associated with the modalities. 5. Prioritize patient orders based on urgency and need, i.e. portable chest in ICU, trauma c-spine in ER, and outpatient knee, all at the same time. Course fee required. Prerequisite: Admission to the Utah Tech University Medical Radiography program.
RADT 3020. Advanced Medical Imaging. 3 Hours.
Fourth semester course. Introduces additional imaging modalities and radiation therapy, including interventional radiography, sonography, CT, MRI, mammography, nuclear medicine and basic sectional anatomy. Taught in cohort rotation. This course requires a Differential Tuition Rate which is an additional fee of $60 charged per credit hour. **COURSE LEARNING OUTCOMES (CLOs) At the successful completion of this course, students will be able to: 1. Compare and contrast the benefits and limitations of different radiologic modalities including general diagnostic, CT, sonography, MR and nuclear medicine. 2. Compare basic equipment in various imaging modalities and radiation therapy. 3. Locate basic anatomy on cross-sectional images of the head, thorax, abdomen and extremities. 4. Describe patient preparation necessary for special radiographic procedures and various modalities. 5. List pathologic conditions best demonstrated by CT, sonography, nuclear medicine, MRI and PET. Prerequisite: Admission to the Utah Tech University Medical Radiography program.

RADT 3150. Radiobiology and Protection. 3 Hours.
Fourth semester course. In depth analysis of ionizing radiation and its effects on matter, including early and late effects of radiation, dose limits, radiation monitoring, and limiting radiation exposure to patients and personnel. Taught in cohort rotation. This course requires a Differential Tuition Rate which is an additional fee of $60 charged per credit hour. **COURSE LEARNING OUTCOMES (CLOs) At the successful completion of this course, students will be able to: 1. Explain the parts and function of the human cell. 2. Employ dose response curves to study the relationship between radiation dose levels and the degree of injury response. 3. Describe ways to decrease exposure to the occupational worker. 4. Discuss ways in which the radiographer can reduce patient exposure. 5. Discuss the radiographer's role in educating the public about radiation exposure. Prerequisite: Admission to Utah Tech Medical Radiography program.

RADT 3240. Clinical Education V (ALPP). 7 Hours.
Fifth semester course. Continuation of RADT 2040 with emphasis on developing an autonomous approach to the diversity of clinical situations and successfully adapting to them. Extended advanced modality rotations may be arranged following established guidelines and at the discretion of the Clinical Coordinator. 315 clinical hours. Taught in cohort rotation. This course is designated as an Active Learning Professional Practice (ALPP) course. This course allows students to explore and apply content learned in the course in a professional experience away from the classroom. This course requires a Differential Tuition Rate which is an additional fee of $60 charged per credit hour. **COURSE LEARNING OUTCOMES (CLOs) At the successful completion of this course, students will be able to: 1. Complete remaining competencies with an 85% or better and complete five terminal competencies with a 95% or better. 2. Apply good communication skills with patients, support staff and technologist. 3. Adapt to changes and varying clinical situations as well as modifying positioning for non-routine (trauma) procedures. 4. Distinguish between acceptable and unacceptable radiographic images. 5. Apply principles of ALARA to minimize exposure to patient, self and others. Course fee required. Prerequisite: Admission to the Utah Tech University Medical Radiography program.

RADT 3260. Radiography Seminar. 3 Hours.
Fifth semester course. Capstone course that offers review and reflection on previous coursework, providing students with a meaningful approach to evaluate strengths and weaknesses and to prepare for credentialing exams and employment. Taught in cohort rotation. This course requires a Differential Tuition Rate which is an additional fee of $60 charged per credit hour. **COURSE LEARNING OUTCOMES (CLOs) At the successful completion of this course, students will be able to: 1. Design a lesson plan to review an assigned ARRT registry section. 2. Assemble a portfolio containing samples of student work demonstrating accomplishment of learning outcomes. 3. Demonstrate competency in each of the ARRT registry areas - patient care, procedures, image production and safety. 4. Present their review lesson on a predetermined ARRT registry section to their peers. Prerequisite: Admission to the Utah Tech University Medical Radiography program.