

## **RADIOLOGIC TECHNOLOGY PROGRAM**

### **COURSE DESCRIPTIONS**

#### **Term I:**

##### **Radiographic Procedures I (3 credits)**

This course is the first in a series of courses dealing with principals, techniques and radiographic procedures in radiology. This course is designed to give the student an introduction to the basics of diagnostic radiography. Radiographic procedures will also include the preliminary steps to taking a radiograph, general radiographic anatomy and positioning terminology, including related terminology of the chest, abdomen, upper extremity, shoulder girdle and lower extremity. The clinical education component provides the student with the opportunity to perform radiographic procedures in accordance with the clinical competency evaluation process.

##### **Anatomy/Medical Terminology I (3 credits)**

This course is designed to study the human structure and its functions. Specific emphasis will be placed on structure and function of cells, tissues, and systems to include respiratory, bones and joints, and upper extremities. It also provides an introduction to the origin and derivation of medical terms and abbreviations, as well as their meaning. An exploration of prefixes, suffixes and root word combinations to create specific medical terms is included.

##### **Introduction to Radiography (3 credits)**

This course is an introduction to the radiography program, the field of radiology and the organization. Topics for discussion include general radiology history, professional organizations, accreditation, licensure, and professional pathways. It also emphasizes communication, safety and basic radiation protection and legal and ethical responsibilities. HIPPA, AIDS, Body Mechanics, infection Control, AIDET and emergency preparedness will also be covered.

##### **Radiation Protection I (3 credits)**

This course is an overview of how x-rays are produced and their interactions in human tissue. The course is designed to provide a foundation for understanding the production of x-rays, the effects of radiation exposure, and structural requirements for radiation protection.

##### **First Clinical Rotation Experience (2.6 credits)**

Clinical rotation experience I is the first in a series of eight rotations that provide the student with the necessary clinical education needed in the actual practice of radiography. This course takes place in the clinical area. The student is exposed to actual patient contact. The student will begin to rotate through clinical areas of general radiology and will begin to master the basic skills necessary to function in a radiography room. The student will also begin to learn to master basic radiographic examinations under the direct supervision of a clinical instructor/technologist to meet their clinical challenges/competencies.

## **Term II:**

### **Radiographic Procedures II (3 credits)**

A continuation of radiographic procedures I, including related terminology of the shoulder girdle, lower extremities and pelvic girdle. Students will continue to rotate through various aspects of the radiology department to involve clinical participation under direct and indirect supervision of procedure taught in radiographic procedures I and II and to master basic patient care.

### **Anatomy/Medical Terminology II (3 credits)**

This course is a continuation of Anatomy/Medical Terminology I and is designed to study the human structure and its functions. Structures and functions to be discussed include lower limbs, integumentary system and the sensory organs.

### **Patient Care (3 credits)**

This course is a continuation of Introduction to Radiography and is designed to acquire the skills necessary to provide excellent patient care. Topics covered include vital signs, emergency recognition and response, dealing with emergency situations, contrast media administration and patients with special conditions.

### **Radiation Protection II (3 credits)**

This is a continuation of Radiation Protection I. This course identifies the human response to ionizing radiation and identifies tissues that are more sensitive than others in radiation. The course also discusses the early and late effects of radiation, designing for radiation protection and patient radiation dose management.

### **Second Clinical Rotation Experience (2.6 credits)**

This course is a continuation of Clinical Experience Rotation I as students continue to rotate through various aspects of the radiology department to involve clinical participation under direct and indirect supervision of procedures taught in Radiographic Procedures I and II and to master basic patient care and meet their clinical challenges/competencies.

## **Term III:**

### **Radiographic Procedures III (3 credits)**

A continuation of Radiographic Procedures I and II, including related terminology of the sternum and SC joints, ribs, cervical, thoracic, lumbar spines, sacrum and coccyx and urinary system. Laboratory simulations are also conducted.

### **Anatomy/Medical Terminology III (3 credits)**

This course is a continuation of Anatomy/Medical terminology I and II and is designed to give the student basic understanding and knowledge of the anatomical and physiological aspects of the vertebral column, urinary system and digestive system of the human body.

### **Radiation Physics I (3 credits)**

This course is designed to present the student with the fundamental units of measure of electrical and radiation physics and the basic principles underlying the operation of x-ray equipment and circuit components. Topics will include the radiation concepts of matter, energy, electricity, electrostatics, electromagnetism, generators and motors, and the properties of x-rays.

## **Term III Cont.:**

### **Radiographic Exposure I (3 credits)**

Basic fundamentals concerned with the production, analysis, and recording of radiographic images are included in this course. An introductory review of mathematical equations as well as ratio and proportions are included. Other topics covered include: mA and time relationships, Inverse Square Law, image receptors (film screen/digital) intensifying screens, beam restricting devices, filtration and grids, manual and automatic film processing, sensitometry and artifacts.

### **Third Clinical Rotation Experience (2.6 credits)**

This course is a continuation of Clinical Experience Rotation I and II as students continue to rotate through various aspects of the radiology department to involve clinical participation under direct and indirect supervision of procedures taught in Radiographic Procedures I, II and III and to continue to master patient care and meet their clinical challenges/competencies.

## **Term IV:**

### **Radiographic Procedures IV (3 credits)**

A continuation of Radiographic Procedures I,II and III including related terminology of the cranium and facial bones, paranasal sinuses, mastoids, mandible, orbits and TMJ's. Laboratory simulations are also conducted.

### **Anatomy/Medical Terminology IV (3 credits)**

This course is a continuation of Anatomy/Medical Terminology I,II and III and is designed to give the student basic understanding and knowledge of the anatomical and physiological aspect of the blood/circulatory system, skull and facial bones, paranasal sinuses, male/female reproductive system, endocrine, and nervous system.

### **Radiation Physics II (3 credits)**

This course begins with a review of the basic principles of Radiation Physics I. The x-ray circuit and the operating principles of radiologic equipment will be reviewed and will include the autotransformers, transformers, the rectification system, and the x-ray tube.

### **Radiographic Exposure II (3 credits)**

This course builds on the concepts mastered in Radiographic Exposure I and covers topics including the radiographic qualities of density, contrast, detail and distortion, artifacts and techniques. Lecture, demonstration and class experiments are utilized so that students master imaging techniques based on sound principles and practices.

### **Fourth Clinical Rotation Experience (2.6 credits)**

This course is a continuation of Clinical Experience Rotation I,II and III as students continue to rotate through various aspects of the radiology department to involve clinical participation under direct and indirect supervision of procedures taught in Radiographic Procedures I, II, III and IV and allows them to meet their clinical challenges/competencies.

## **Term V:**

### **Imaging Equipment I (2.2 credits)**

This course provides the student with a thorough understanding of specific radiographic imaging equipment used in general radiology and the evaluation of these systems through systematic quality control testing. Topics of discussion will include tomography, mobile radiography, mammography, and automatic exposure control.

### **Quality Assurance (2.2 credits)**

This course covers both quality assurance programs and quality control procedures in radiology. Fundamental concepts of quality assurance are presented including improvement and devices used to ensure quality control of radiographic equipment. Repeat film analysis is also included both in classroom discussion and clinical experience. Students must integrate the findings of repeat film analysis into a performance improvement project. PACS is also discussed in this course.

### **Fifth Clinical Rotation Experience (4 credits)**

This course is a continuation of Clinical Experience Rotation I, II, III, and IV as students continue to rotate through various aspects of the radiology department to involve clinical participation and provides comprehensive instruction on radiographic procedures including orthopedic, trauma, mobile, pediatric procedures and surgical/OR. Senior students will also rotate through various medical imaging modalities of CT, MRI, sonography, NM, radiation therapy, IR, mammography, and cardiac catheterization to gain comprehensive understanding of medical imaging and meet their clinical challenges/competencies.

## **Term VI:**

### **Imaging Equipment II (2.2 credits)**

This course provides the student with a thorough understanding of specific radiographic imaging equipment used in radiology especially image intensification and digital fluoroscopy. This course is an introduction to the medical uses of the computer with special emphasis on the application of computers in the field of radiology. Topics include the basic components of computer systems, computer operations and the analog to digital conversion process. The course is also designed to provide entry-level radiography students with principles related to computed tomography (CT) imaging.

### **Pathology I (2.2 credits)**

This course is designed to introduce concepts related to disease and etiological considerations with emphasis on radiographic appearance of disease and impact on exposure factors selection of the respiratory and skeletal systems. The material covered should enhance the student's knowledge regarding interpretation of clinical information provided on the requisition and or patient's chart. There will also be case studies and critical thinking exercises and a written research paper on an assigned pathology with oral presentation.

### **Sixth Clinical Rotation Experience (4 credits)**

This course is a continuation of Clinical Experience Rotation I, II, III, IV, and V as students continue to rotate through various aspects of the radiology department to involve clinical participation and provides comprehensive instruction on radiographic procedures including surgical and trauma, as well as other imaging procedures to meet their clinical challenges/competencies.

## **Term VII:**

### **Special Procedures (2.2 credits)**

This course is designed to acquaint the student with the specialized and highly technical procedures in radiography. Diagnostic angiography and interventional procedures such as angioplasty and stent placement as well as related pathologies are investigated. Specialized equipment, contrast media and the indication/contraindications for each procedure are explored. The Director of Education will give an EKG lecture. In addition, students will be required to present case studies on specific specialized procedures.

### **Pathology II (2.2 credits)**

This course is a continuation of Pathology I focusing on the concepts related to disease and etiological considerations specifically on the appearance of the disease and exposure factors selection of the hematopoietic and cardiovascular system. The Gastrointestinal, urinary and nervous system will be discussed. Case studies and critical thinking exercises and will be assigned.

### **Seventh Clinical Rotation Experience (4 credits)**

This course is a continuation of Clinical Experience Rotation I, II, III, IV, V, and VI as students continue to rotate through various aspects of the radiology department to involve clinical participation and performance to meet their clinical challenges/competencies.

## **Term VIII:**

### **Registry Review (2.2 credits)**

The focus of this course is preparation for ARRT examination. Attention is focused on the content specifications for radiography as provided by the ARRT. This course will help identify strengths and remedy weakness. Successful exam preparation and testing taking strategies are also explored. Several standardized review exams are taken during the semester; subsequent reviews are planned based on the results of the exams and the need of the students.

### **Review Notebook (2.2 credits)**

All second year students will make a review notebook. The notebook will have 5 categories to correspond with the five sections on the ARRT national registry exam. The review notebook will begin in October of their senior year and will be completed by June of their senior year. There will be a total of 25 review assignments.

### **Eight Clinical Rotation Experience (4 credits)**

This course is a continuation of Clinical Experience Rotation I, II, III, IV, V, VI and VII as students continue and prepare to meet all their required clinical challenges/competencies necessary for graduation.