

## **COURSE DESCRIPTIONS**

The courses, credit hours, term when the instruction occurs and description of the course contents for the Program are identified.

Responsibility: Program Director, Faculty

Standard: Curriculum

JRCERT 2021 Radiography Standard(s): 4.2, 4.5, 5.3

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### **200 Introduction to Radiologic Technology**

2 credit hours

Begins first term

This course introduces the student to the goals of the Program, the obligations of the student in the Program, an introduction to radiation safety associated with radiation and the hospital environment, the hospital philosophy and organizational structure of the hospital, the Imaging Services department and its goals and an overview of the field of radiologic technology.

### **210 Medical Ethics**

1 credit hour

Begins first term

This course discusses the origin of medical ethics. It introduces students to the concepts of professional ethics and ethical behavior. It provides a basic understanding of criminal versus civil law and the terminology related to these topics. Professional standards of practice and a code of ethics are discussed as well as the responsibility of the radiologic technologist to each of these. The concept of self-governance is discussed

### **220 Principles of Patient Care**

2 credit hours

Begins first term

This course introduces the basic concepts of patient care, radiation protection, including body mechanics, patient observation, physical examination, vital signs determination, emergencies and their management, medical-surgical asepsis, management of oxygen systems, intravenous and nasogastric therapy, urinary drainage systems, standard precautions and medications encountered in the radiology department

### **230 Radiographic Procedures I**

3 credit hours

Begins first term

This course presents an overview of systemic and skeletal anatomy, positional radiographic projection, anatomic relationship terminology, and imaging principles. Identity of anatomy, physiology, and pathology of the following anatomic structures/systems will be discussed: chest; abdomen; upper extremity; bony thorax, ribs and sternum; upper and lower GI systems; trauma,

mobile, and surgical radiography; and pediatric, geriatric, and bariatric patients. Radiographic positioning for these structures/systems for radiographic examinations will be taught to ensure the student has a basic foundation upon which to build in the clinical environment.

### **235 Radiographic Procedures II**

3 credit hours

Begins second term

A continuation of course 230, this course continues with identity of anatomy, physiology, and pathology of the following anatomic structures/systems: humerus and shoulder girdle, lower extremity, femur and pelvic girdle, spine, cranium, facial bones, urinary and reproductive systems and venipuncture, and special radiographic procedures. Positioning for these structures for radiographic examinations will be taught to ensure the student has a basic foundation upon which to build in the clinical environment.

### **240 Radiation Physics I**

1 credit hour

Begins first term

This introductory course provides a review of unit conversions and mathematic equations associated with the concepts presented. It discusses a basic history of medical imaging. Covers matter, energy, and the atom. Electrostatics, magnetism, electrodynamics are all presented in relation to x-ray production. Electric circuit of the x-ray machine is introduced as well as the x-ray tube itself. Interactions of x-radiation with matter and the physical properties of radiation are also communicated.

### **260 Health Physics I**

1 credit hour

Begins first term

This course covers the basic definition of ionizing radiation and describes the interactions of ionizing radiation with matter. Topics will include radiation quantities and units of measure, sources of radiation, and radiation monitoring technique. Discussions will cover the concepts of background equivalent radiation time (BERT) and As Low as Reasonably Achievable (ALARA). The content presents an overview of the principles of radiation protection, including the responsibilities of the radiographer for patients, personnel and the public.

### **270 Radiographic Exposures I**

1 credit hour

Begins second term

This course provides a thorough understanding of the different technical factors and how altering these technical factors affects the signal in the remnant beam. This knowledge is intended to guide the students practical application of technique selection based on sound principles and practices.

**285-A Radiographic Positioning Lab and Evaluation of Radiographs**

0.5 credit hour

Begins first term

This laboratory course is taken in conjunction with Radiographic Procedures I.

The course evaluates radiographs for proper radiographic technique, positioning, anatomical visualization, projection identification and proper image receptor size selection. Pathologic considerations of selected radiographs are discussed.

**285-B Radiographic Positioning Lab and Evaluation of Radiographs**

0.5 credit hour

Begins second term

This laboratory course is taken in conjunction with Radiographic Procedures II.

The course evaluates radiographs for proper radiographic technique, positioning, anatomical visualization, projection identification and proper image receptor size selection. Pathologic considerations of selected radiographs are discussed.

**290 Clinical Education I-A**

8 credit hours

Begins first term

This course provides clinical application of radiographic positioning taught in Radiographic Procedures I, patient care as taught in Principles of Patient Care, and radiographic safety as taught in Health Physics I. Students schedule themselves for daytime and weekend shifts.

**295 Clinical Education I-B**

8.5 credit hours

Begins second term

This course provides clinical application of radiographic positioning taught in Radiographic Procedures I and II, patient care as taught in Principles of Patient Care and Advanced Patient Care, radiographic exposure techniques as taught in Radiographic Exposures I and Digital Imaging. Students schedule themselves for daytime and weekend shifts.

**320 Advanced Patient Care**

1 credit hour

Begins second term

The course includes an overview of phlebotomy and venipuncture techniques, including administration of radiographic contrast agents, and pharmacology.

The student will also be introduced to an overview of common lab values.

Students will learn theory and basic techniques of EKG and will be instructed in aspects of human diversity.

### **340 Radiation Physics II**

2 credit hours

Begins fourth term

This course presents an in-depth look at the various aspects of physics, especially electromagnetic and particulate radiation as it pertains to radiology. It also reviews electrodynamic, x-ray machine circuits, x-ray tube and x-ray production

### **350 Imaging Equipment**

2 credit hours

Begins fourth term

This course discusses the operation and physics associated with different types of equipment used in diagnostic radiology. Quality Assurance is also discussed with quality assurance testing for radiographic, fluoroscopic and tomographic units being discussed.

### **360 Health Physics II**

2 credit hours

Begins fourth term

This course reinforces ALARA concepts taught during Course 260 Health Physics I as well as presenting new topics. This course will foster an understanding of the perceptions of radiation risk. Students will learn the federal, state and accrediting agencies' requirements for measuring and limiting radiation dose. Different radiation quantities and the units used to measure them are thoroughly examined. The various equipment used to measure radiation and their characteristics will be discussed. Equipment design and structural layouts will be discussed as they relate to radiation protection. The proper method of monitoring occupational radiation levels will be included, and the methods of limiting radiation dose to both personnel, patients, and the general public will be presented.

### **365 Pathophysiology**

3 credit hours

Begins third term

The course will review human physiology, pathologies and congenital abnormalities of all systems, advanced discussion of image evaluation and application of critical thinking to viewing radiographic images.

### **369 Radiobiology**

2 credit hours

Begins fourth term

This course defines the effects of radiation on the human body from the cellular level to the effects on the entire body. The student learns short term and long term responses of the body to radiation from the developing embryo through adulthood.

**370 Digital Imaging**

3 credit hours

Begins second term

This course will provide instruction regarding radiographic image acquisition and processing for various types of radiographic recording media including PSP (CR) and FPD (DR). It is also a continuation of the study of radiographic imaging technique formulation, image quality assurance, and the synthesis of variables in image production. An in-depth look at PACS is also covered.

**375 Radiographic Exposure II**

2 credit hours

Begins third term

This course provides an in-depth analysis of the factors that govern and influence the production of radiographic images in enabling the student to apply this information to clinical situations.

**380 Advanced Imaging Procedures and Sectional Anatomy**

3 credit hours

Begins third term

This course provides a brief overview of mammography, nuclear medicine, ultrasound, computed tomography, interventional radiography, cardio-angiography, magnetic resonance and bone densitometry. This course will provide the student with instruction in anatomy of the circulatory system and brain, correlating with sectional anatomy. Comprehensive sectional anatomy of the cranium and facial bones, brain, spine, neck, thorax, abdomen, pelvis, upper and lower extremities will also be incorporated into this course.

**390 Clinical Education II-A**

13 credit hours

Begins third term

A continuation of Courses 290 and 295 Clinical Education IA and IB. Students, with increasing autonomy, move towards indirect supervision and are allowed more independence to reinforce skills previously used. The student schedules him or herself for radiography clinical areas and other modalities in the department.

**395 Clinical Education II-B**

12 credit hours

Begins fourth term

A continuation of Courses 390. Students, with increasing autonomy, move towards indirect supervision and are allowed more independence to reinforce skills previously used. The student schedules him or herself for radiography clinical areas and other modalities in the department.

**399 Review and Presentation**

1.5 credit hours

Begins fourth term

This course provides the student with independent investigation into the various aspects of radiology and the opportunity to present information by posters, case studies, and papers. The course also provides students with the opportunity to prepare for the national certification examination.

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Signature

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Program Director

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Signature

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Director of Imaging Services

| Reviewed: 7/14/11, 2/9/12, 5/16/13, 2/28/2014, 1/30/15, 2/12/16, 4/27/2020, 9/21/21, 2/17/2022, 2/15/24, 5/27/2025

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