

Clinical Education II

700 hours

During this course, the student will continue to progress through their clinical assignments. The student rotations during this semester will also include rotations to some of the specialty imaging areas. The student becomes more confident and has passed competencies for some of the basic exams, so they will now be performing more of them under indirect supervision. The student is continually learning more radiographic examinations and performing them under direct supervision. The student must continue to complete objective checklists for each rotation and clinical performance evaluations weekly.

Prerequisite: Clinical Education I

Clinical Education III

700 hours

The student is still progressing through their clinical assignments. Students continue to assist/perform radiographic examinations under direct and indirect supervision. During the 3rd and 4th semesters, the student will spend more time in the specialty areas, and some of their choice. The student is progressing clinically during this time, and must continue to complete objective checklists for each rotation and clinical performance evaluations weekly.

Prerequisite: Clinical Education II

Clinical Education IV

400 hours

The student will complete their clinical assignments during this semester. During this time, emphasis is placed on *proficiency* in performing examinations. Students are now capable of performing many examinations under indirect supervision. Students are able to work more independently during this time. During this semester, students are required to complete all the mandatory and elective competencies. Focus is placed on analyzing images and understanding techniques. Students must complete all objectives and clinical assignments for graduation.

Prerequisite: Clinical Education III

Digital Imaging

Instructor – Alanda Small

30 hours

This course will assist the junior student's understanding of how digital imaging works and how they can improve the patient's care with better imaging techniques. This course will give the student a basic understanding of digital radiography and Picture Archiving and Communication Systems, how CR and DR images are created and captured, pre- and post-processing techniques, the display systems, medical informatics, quality management, and the difference between CR and DR in the clinical environment.

Prerequisite: None

Image Analysis I

Instructor – Alanda Small

30 hours

This course is designed to give the first year student a basic understanding of acceptable images. The anatomy and positioning of images will be reviewed in Radiographic Procedures course. Students will learn to identify the projection as they look at each image. Image Analysis is an important point in the radiographic process, and relates and integrates with all other courses, especially Radiographic Procedures I and II.

Prerequisite: None

Image Analysis II**Instructor – Alanda Small****45 hours**

Upon completion of this course, the student will be able to recognize the difference between acceptable and unacceptable radiographic images and how to adjust in positioning. The student will also learn image evaluation criteria for many different radiographic projections. Image Analysis II is taught concurrently with Advanced Procedures, and Trauma Radiography.

Prerequisites: Radiographic Procedures and Imaging Analysis I

Introduction to Specialized Imaging**Self-Study Course****No hours**

This course does not involve any classroom hours. It is a self-study course for Junior students. The students are given assignments to complete. The information assigned relates to the specialized imaging of Radiology in order to provide the student with a better understanding of the areas of CT, Ultrasound, MRI, Nuclear Medicine, Radiation Therapy, IR, Heart Catheterization, Mammography, and Bone Densitometry. This course is intended to provide students with a background into these areas of imaging, so that they have a basic understanding of what goes on in these areas, prior to their clinical rotation. Students have clinical rotations through all of these areas, except bone densitometry, throughout their two years of training.

Prerequisite: None

Medical Terminology I**Instructor – Heidi Knoll****15 hours**

For radiographers to function intelligently and interact effectively with health professionals in the clinical environment, they must be able to read, write, and speak the medical language. The intent of this course is to introduce the student to commonly used medical words so that they may become more familiar with these medical words as they read them in patient charts, on patient exam, requests, or hear them used in the health care setting.

Prerequisite: None

Medical Terminology II**Instructor – Heidi Knoll****15 hours**

This course is a continuation of Medical Terminology I. The intent of this course is to introduce the student to commonly used medical words so that they may become more familiar with these medical words as they read them in patient charts, on patient exam requests, or hear them used in the health care setting.

Prerequisite: Medical Terminology I

Mobile and Surgical Radiography**Instructor – Amanda Dykema****15 hours**

This course is a continuation of Medical Terminology I. The intent of this course is to introduce the student to commonly used medical words so that they may become more familiar with these medical words as they read them in patient charts, on patient exam requests, or hear them used in the health care setting.

Prerequisite: None

Pathology**Instructor – Heidi Knoll****40 hours**

This course involves the study of abnormal changes in the function or structure within the body. We will cover the signs and/or symptoms of diseases, their causes, and the radiographic appearance of certain diseases. Students will learn the role of the radiographer in imaging the changes in normal anatomy and tissue brought on by disease. The course involves studying many different diseases with which a radiographer must become familiar.

Prerequisite: Imaging Analysis I

Patient Care I**Instructor – Heidi Knoll****25 hours**

This course is to introduce the junior radiography student to certain procedures, methods, techniques and equipment used for the general care of patients. The student will learn the importance of history taking and how to interact professionally and appropriately with all age groups. This course will cover basic transfer and immobilization techniques.

Prerequisite: None

Patient Care II**Instructor – Heidi Knoll****30 hours**

Students will also learn about many of the common drugs, along with the different types of contrast media, and their functions. The course covers what to do in a medical emergency and what drugs are commonly found in a crash cart. Included in the course is the study of aseptic and nonaseptic techniques. The student will also learn about ethical and legal issues of Radiology, and medical law in the health care profession.

Prerequisite: Patient Care I

Principles of Exposure**Instructor – Amanda Dykema 30 hours**

Principles of Exposure introduces the subject of radiographic image quality, describing principles that contribute to the sharpness and visibility of the recorded image. Each factor is examined separately, with emphasis on calculating its effects through the use of the appropriate formulas and their practical applications. Upon completion of the course, the student will be able to employ technical factors, use accessory items such as grids, screens, etc., and have the knowledge to obtain optimum radiographic results.

Prerequisites: None

Professionalism I**Instructor – Heidi Knoll****5 hours**

This course covers introductory information on the North Dakota Society of Radiologic Technologists (NDSRT), American Society of Radiologic Technologists (ASRT), American Registry of Radiologic Technologists (ARRT), and the accreditation body of Joint Review Committee on Education in Radiologic Technology (JRCERT). Students will be required to become members of both the NDSRT and ASRT as a part of this course.

Prerequisite: None

Professionalism II**Instructor – Heidi Knoll****5 hours**

This course helps prepare senior students for applying/taking boards, professional development, job seeking, and provides information on obtaining North Dakota state licensure.

Participation in mock interviews is available upon request.

Prerequisite: Professionalism I

Radiation Protection & Biology**Instructor – Heidi Knoll****45 hours**

This course includes methods of radiation protection including the different types of devices available. Students will study the biological effects of radiation, including short-term and long-term effects. Students will learn how to minimize exposure to the patient, themselves, and others. The course includes studying the rationale for shielding, the purpose of beam restriction, and the effects of filtration, both inherent and compensating. Sources of radiation will be taught along with maximum permissible dosages, both public and occupational as recommended by the NCRP. Students will learn about personnel monitoring and its proper uses, and survey meters. The student will also learn about the different units of measurement involved with radiation, and the basics of ALARA.

Prerequisite: Principles of Exposure, College A & P.

Radiographic Physics**Instructor – Heidi Knoll****30 hours**

This course provides the student with an understanding of the principles involved in x-ray production, and learning of the parts of the x-ray equipment. It includes the study of atoms, learning about the difference between electromagnetic and particulate radiation, the study of the x-ray tube and how x-rays are produced, and x-ray interactions with matter. Also included in this course are methods to control scatter, learning about automatic exposure control, and the study of the parts and function of the image intensifier. Students will also learn how equipment is designed for radiation protection, and the testing standards required to be performed on equipment.

Prerequisite: Principles of Exposure

Radiographic Procedures I**Instructor - Alanda Small****45 hours**

This course includes a step-by-step process into teaching the student to take radiographs on actual patients. This course goes hand in hand with Clinical Education I by learning in the classroom, Lab, and performing examinations on actual patients. Students start by learning in the classroom about specific body anatomy, and the positions and projections necessary to take each specific radiograph. Students will learn various anatomical parts and routine projections by studying the skeleton, bones, drawings, and radiographic images.

Prerequisite: None

Radiographic Procedures – LAB I**Instructor – Amanda Dykema****50 hours**

The student will learn anatomy and positioning during the Radiographic Procedures course, for each exam. Then, the Clinical Instructor will demonstrate proper positioning on an individual, using role-play. The students will be given LAB time to practice. The Clinical Instructor will test students as they demonstrate the procedure. The student is not allowed to perform an exam on actual patients until they have passed both the written and the LAB test. This course correlates with Clinical Education I by learning in the classroom, and performing examinations on actual patients.

Prerequisite: None

Radiographic Procedures II**Instructor - Alanda Small****45 hours**

This course includes a step-by-step process of teaching a student how to take radiographs on actual patients. This course goes hand in hand with Clinical Education I and II by learning in the classroom, Lab, and performing examinations on actual patients. Students start by learning in the classroom about specific body anatomy, positions and projections necessary to take each specific radiograph. Students will learn various anatomical parts and routine projections by studying the skeleton, bones, drawings, and radiographic images.

Prerequisite: Radiographic Procedures I

Radiographic Procedures - LAB II Instructor – Amanda Dykema 50 hours

The student will learn anatomy and positioning during the Radiographic Procedures course, for each exam. Then, the Clinical Instructor will demonstrate proper positioning on an individual, using role play. The students will be given LAB time to practice. The Clinical Instructor will test students as they demonstrate the procedure. The student is not allowed to perform an exam on actual patients until they have passed both the written and the LAB test. This course correlates with Clinical Education II by learning in the classroom, and performing examinations on actual patients.

Prerequisite: Radiographic Procedures - LAB I

Registry Review Instructors – Heidi K./Alanda S./Amanda D. 45 hours

This course is a review of information that students have learned. The student will complete a variety of review study programs online in preparation for taking the ARRT national certification examination. As directed by faculty, students will purchase and complete online review programs. Most of this course is self-study, in preparing students to take Boards. This course begins in June of their junior year, prior to graduation.

Prerequisite: Junior level didactic courses

Trauma Radiography Instructor – Amanda Dykema 15 hours

This course will prepare the senior student to care for trauma patients and teach them how to radiograph these patients as quickly and as efficiently as possible. In this course, students will learn to modify patient positioning due to injury. The course also includes information about the various types of fractures that may occur, and how to properly image patients with those injuries.

Prerequisites: Radiographic Procedures I and II

