BISMARCK MEDICAL CENTER RADIOGRAPHY PROGRAM
COURSE DESCRIPTIONS (IN ALPHABETICAL ORDER)

Advanced Procedures **Instructor – Alanda Small** **45 hours**
During this class, various techniques to aid in radiographing children will be taught. Some of the topics covered will be age-appropriate methods for radiography, communication, proper technique, radiation protection methods and immobilizing the child.
This course also offers a review of basic positioning with specific anatomy that was taught in Radiographic Procedures I and II. In addition, non-routine procedures and specialized examinations will also be included. The student will also gain a better understanding of special exams such as biliary duct procedures, hysterosalpingography, orthoroentgenography, arthrography, myelography, angiography, interventional, and noninterventional procedures. Instruction will include reasons for doing exams, how they are performed, and the projections and positions used for many exams.
Prerequisite: Radio. Procedures I and II

Anatomy & Physiology I **Instructor – Heidi Knoll** **15 hours**
This course is the study of the body structure including size, shape, composition and also how the body functions. It is taught during the Junior year. We will cover the organ systems from simplest to most complex that make up an individual person. We will also cover the function of each system. During this course, the student will learn the proper terminology to describe the location of body parts with respect to one another. This course includes the study of body cavities, membranes, and organs within each cavity.
Prerequisite: college A & P

Anatomy & Physiology II **Instructor – Heidi Knoll** **30 hours**
This course continues in the study of the body structure including size, shape, composition and also how the body functions. It is taught during the Senior year. We will cover the organ systems from simplest to most complex that make up an individual person. We will also cover the function of each system. During this course the student will learn the proper terminology to describe the location of body parts with respect to one another. This course includes the study of body cavities, membranes, and organs within each cavity.
Prerequisite: A & P I

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 & DR images are created and captured, the difference between CR and DR in the clinical environment, pre & post processing techniques, display systems, medical informatics, and quality management. The student is required to watch the RTBC videos and do the quizzes and assessments for the correlating chapters.
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 the Radiographic

Procedures course. Students will learn to identify the projection as they look at each image. Image Analysis is an important part of the radiographic process, and relates and integrates with all other courses, especially Radiographic Procedures I and Radiographic Procedures 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 readjust inaccurate 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 to provide the student with a better understanding of the areas of CT, Sonography, 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 they have a basic understanding of what goes on in these areas, prior to their clinical rotation.
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 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 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 & Surgical Radiography **Instructor – Amanda Dykema** **15 hours**
This course will prepare the student in performing portable examinations on patients that cannot come to the imaging department. It will inform them of different precautions they may encounter, techniques to set, and how to maneuver the portable machine to obtain the images. This course will also teach the student about the OR setting and how to operate the C-Arm and O-Arm. They will be introduced to some commonly performed surgical exams they will be involved in. This class will help them become more comfortable and competent in both surgical and clinical settings, with instruction within the classroom and clinic respectively.
Prerequisite: None

Pathology **Instructor – Heidi Knoll** **45 hours**
This course involves the study of abnormal changes in the function or structure within the

body. It covers the signs and symptoms of disease, their causes, and the radiographic appearance of certain diseases. Many types of disease exist, and many conditions can be demonstrated radiographically. Students will learn the role of the radiographer in imaging changes in normal anatomy and tissue density brought on by disease.
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 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 an accessory item such as grids 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 for obtaining North Dakota state licensure. Participation in mock interviews is also available upon request.
Prerequisite: Professionalism I

Radiation Protection & Biology **Instructor – Heidi Knoll** **40 hours**
This course includes the purpose of radiation protection, the rationale for shielding, and the different types of shielding available. Students will be taught how to educate the public on radiation, how to minimize exposure to the patient, themselves and others, and the biological effects of radiation on the body. The early and late effects of radiation will be taught, along with the formulas for calculating equivalent and effective doses. Students will learn about personnel

monitoring, its proper uses, and the various components of different dosimeters. In addition, radiation survey meters will be discussed. The student will also learn about the 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 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.
Prerequisite: Principles of Exposure

Radiographic Procedures I 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 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: None

Radiographic Procedures – LAB I Instructor – Amanda Dykema 50 hours
In this course, junior students will learn anatomy and positioning during the Radiographic Procedures I course, for each exam. The clinical instructor will demonstrate proper positioning on an individual using role-play for exams. The students will be given LAB time to practice. The Clinical Instructor will test students as they demonstrate the procedure. This course will help the student become more comfortable with manipulating the equipment, communicating with patients, setting technical factors, and using positioning aids when necessary. 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. The goal is to prepare the student so they can position patients properly without any difficulty.
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. The student must pass all tests with a 78%.
Prerequisite: Radiographic Procedures I

Radiographic Procedures - LAB II Instructor – Amanda Dykema 50 hours
In this course, junior students will learn anatomy and positioning during the Radiographic Procedures II course, for each exam. The clinical instructor will demonstrate proper positioning on an individual using role-play for exams. The students will be given LAB time to practice. The

Clinical Instructor will test students as they demonstrate the procedure. This course will help the student become more comfortable with manipulating the equipment, communicating with patients, setting technical factors, and using positioning aids when necessary. 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. The goal is to prepare the student so that they can position patients properly without any difficulty.
Prerequisite: Radiographic Procedures I, 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 review materials. Most of this course is self-study, preparing students to take Boards. This course begins in June of the student's junior year and continues through the remainder of the program.
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 the students will learn to modify patient positioning due to injury. The goal is to produce quality images with the least amount of discomfort to the patient. The course also includes information about the various types of fractures that may occur, and how to properly image patients with those injuries. This course will teach the student to use props (sponges, sandbags, etc.), tube tilt and IR placement to gain projections without movement of the trauma patient. This will help demonstrate how to adapt to unique situations and use critical thinking scenarios.
Prerequisites: Radiographic Procedures I and II