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

Advanced Procedures **Instructor – Alanda Small** **45 hours**
During this class, students will study various techniques to aid in radiographing children. Age appropriate methods for radiography, communication, proper technique, radiation protection methods. This course also offers a review of basic positioning of specific areas of the body. A study of non-routine procedures relating to specialized examinations for each body part will also be included. The student will gain a better understanding of special exams such as biliary duct procedures, hysterosalpingography, orthoroentgenography, arthrography and myelography. Instruction will include reasons for doing exams, how they are performed, and the projections used for many exams. Angiography, interventional, and noninterventional procedures will be discussed.
Prerequisite: Radiographic Procedures

Anatomy & Physiology I **Instructor - Cindy Hanson** **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 - Cindy Hanson** **30 hours**
This course continues on 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 how CR and DR images are created and captured, pre- and post-processing techniques, storage of images, the display systems and electronic images, and the difference between CR and DR in the clinical use.
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 radiographic images. The anatomy and positioning of images will be covered in Radiographic Procedures. They will also learn to identify the anatomy and projection as they look at each image. Image Analysis is the terminal point in the radiographic process, and therefore relates and integrates with all other courses, especially Radiographic Procedures.
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 technically acceptable and unacceptable quality of radiographic images and will be able to make adjustments in positioning. The student will also learn image evaluation criteria for many different projections. Image Analysis II is taught concurrently with Advanced Procedures, and Trauma II.
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 - Cindy Hanson** **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 – Cindy Hanson** **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 – 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: None

Pathology **Instructor - Cindy Hanson** **45 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 - Cindy Hanson** **30 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 - Cindy Hanson** **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 – Heidi Knoll** **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

Radiation Protection & Biology **Instructor - Cindy Hanson** **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 – Cindy Hanson 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, then studying 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 radiographs in addition to hands on learning in the clinical setting.
Prerequisite: None

Radiographic Procedures – LAB I Instructor – Heidi Knoll 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 is a continuation of Radiographic Procedures I. 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, then studying 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 radiographs in addition to hands on learning in the clinical setting.
Prerequisite: Radiographic Procedures I

Radiographic Procedures - LAB II Instructor – Heidi Knoll 45 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 – Cindy H./Alanda S./Heidi K. 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 January of the senior year, prior to graduation.
Prerequisite: Junior level didactic courses

Trauma Radiography Instructor – Heidi Knoll 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