RADIOLOGIC TECHNOLOGY

ASSOCIATE OF APPLIED SCIENCE (AAS) – 79 CREDITS

About this program

The Radiologic Technology program prepares individuals to perform various radiologic procedures. The radiologic technologist instructs and positions patients, manipulates radiographic equipment, adjusts exposure factors, provides radiation protection for patient and self, develops radiographic images, evaluates the quality of finished radiographs and carries out activities associated with quality control. The student radiologic technologist carries out these functions under the supervision or upon the direction of a registered radiologic technologist. Graduates of the Radiologic Technology program are eligible for the national certification exam administered by the American Registry of Radiologic Technologists. Successful completion of this exam qualifies the graduate as a Registered Radiologic Technologist.

Program outcomes

1. Practice radiation protection for the patient, self and others by applying the concepts of As Low As Reasonably Achievable (ALARA).
2. Apply positioning skills.
3. Demonstrate patient care skills.
4. Exercise independent judgment in areas of exposure factor manipulations involving all technical factors and equipment for procedures routinely performed in the clinical setting.
5. Evaluate radiographs for appropriate anatomy, positioning and image quality.
6. Conduct him/herself in a professional manner and abide by the Code of Ethics as outlined by the ASRT/ARRT (American Society of Radiologic Technologists/American Registry of Radiologic Technologists).
7. Evaluate the value of professional advancements.
8. Communicate effectively in both medical and professional relationships.

Curriculum overview

Crds	Requirement type
78	Required courses
78	**Total**

Developmental courses note: A student may be required to enroll in developmental courses in reading, writing and math. A student's scores on the Accuplacer assessment will determine enrollment in developmental courses. The purpose of developmental courses is to prepare students for the demands of a college-level curriculum. *Credits may vary.*

Accreditation: Minnesota State Community and Technical College is accredited by the Higher Learning Commission, a regional accreditation agency recognized by the U.S. Department of Education. The Higher Learning Commission 230 South LaSalle Street, Suite 7-500 Chicago, IL 60604-1411 http://www.ncahigherlearningcommission.org Phone: 312.263.0456 / 800.621.7440

Curriculum requirement details

Required courses

Course	Crds
BIOL2260 - Human Anatomy and Physiology I	3
BIOL2262 - Human Anatomy and Physiology II	3
COMM1140 - Interpersonal Communication	3
MATH1114 - College Algebra	4
PHYS1105 - Fundamental Concepts in Physics	3
RADT1102 - Fundamental Concepts of Radiologic Technology	2
RADT1112 - Introduction to Radiologic Technology and Patient Care	4
RADT1116 - Radiographic Procedures I	5
RADT1124 - Radiographic Procedures II	4
RADT1133 - Principles of Radiobiology	4
RADT1140 - Radiographic Imaging	4
RADT1146 - Radiographic Procedures III	4
RADT1180 - Radiographic Clinical I	5
RADT1190 - Radiographic Clinical II	5
RADT2101 - Radiographic Clinical III	4
RADT2110 - Radiographic Clinical IV	5
RADT2120 - Radiographic Clinical V	5
RADT2130 - Radiographic Clinical VI	5
RADT2224 - Imaging Equipment	4
RADT2280 - Radiologic Technology Registry Review	2

Other requirements or restricted electives

Course summaries

BIOL2260 - Human Anatomy and Physiology I ..... ***(3 credits)***
Meets MnTC Goal Area 3. This course is a comprehensive introductory overview of human anatomy and physiology that includes basic fundamental concepts of cell biology, tissues and organs making up the integumentary, skeletal, muscular and nervous systems. It is the first of a two-semester sequence in which anatomy and physiology are studied with an emphasis on structure and functions of systems. This course contains a lab-like component.

Prerequisites:

- Assessment into ENGL 1101 or college level writing equivalent.

BIOL2262 - Human Anatomy and Physiology II ..... ***(3 credits)***
Meets MnTC Goal Area 3. This course is a continuation of Anatomy and Physiology I. Topics will include the study of cells, tissues and organs making up the endocrine, cardiovascular, lymphatic and immune, respiratory, digestive, urinary and reproductive systems. Emphasis is on the structure and function of included systems. This course contains a lab-like component.

Prerequisites:

- Assessment into ENGL 1101 or college level writing equivalent.
- BIOL2260

COMM1140 - Interpersonal Communication ..... ***(3 credits)***
Meets MnTC Goal Area 1. This course will focus on improving students' abilities to communicate effectively in one-to-one dyadic encounters by providing experience-based instruction. Extensive in-class and out-of-class analyses allow the student to examine his/her own and others' informal social interactions. The long-term goal is for the student to apply interpersonal communication theories to daily interactions and draw his/her own conclusions about the effectiveness of interpersonal communication.

Prerequisites:

- Assessment into ENGL 1101

MATH1114 - College Algebra ..... ***(4 credits)***
Meets MnTC Goal Areas 2 and 4. This course includes rational, polynomial, exponential, logarithmic, inverse and quadratic functions. The course also includes equations, inequalities, complex numbers and systems of linear equations. Additional topics may include matrices and determinants.

Prerequisites:

- MATH1020

OR

- Placement Exam

PHYS1105 - Fundamental Concepts in Physics ..... ***(3 credits)***
Meets MnTC Goal Area 3. This is a demonstration-based course that provides an introduction to selected topics in classical and modern physics. Topics will include measurement and significant digits, graphing, dimensional analysis, mechanics of motion, vibrations, waves, sound, electricity and magnetism, light and optics, atomic physics and atomic spectra, lasers and optical fibers, nuclear physics and radiation. The course uses active learning techniques with lab-like experiences. It uses many demonstrations and instructor-guided small group problem-solving activities. Simple algebra is used to ensure that students grasp the course concepts. This course is intended for all students but is especially designed for non-science majors who want an appreciation of and a limited working knowledge in some major areas of physics.

Prerequisites:

- MATH0095

RADT1102 - Fundamental Concepts of Radiologic Technology ..... ***(2 credits)***
This course will introduce the student to foundations of the radiologic technology profession. The content will include: an examination of the organization of health care facilities and radiology departments, the radiologic technologist's role in the health care setting, professional obligations and behaviors, employment opportunities, historical significance of the profession, accreditation of educational programs, educational requirements, certification, registration, and licensure processes, and human diversity in the health care setting.

RADT1112 - Introduction to Radiologic Technology and Patient Care ..... ***(4 credits)***
This course is designed to provide concepts of radiologic sciences and patient care. Included in the course are discussions of professionalism, effective communication, patient physical needs assessment, patient consent procedures, x-ray production characteristics, basic radiation protection procedures, health information confidentiality, medical terminology, principles of pharmacology and contrast media, quality management, ethical behaviors and legal issues in health care. The student will also demonstrate competence in routine and emergency patient care, patient transfer and safety procedures, infection control, aseptic and sterile environment procedures, and radiographic equipment manipulation.

Prerequisites:

- RADT1102

Corequisites:

- RADT1116
- RADT1124

RADT1116 - Radiographic Procedures I ..... ***(5 credits)***
This course will provide the student with the knowledge necessary to perform routine and mobile radiographic procedures relative to the thoracic and abdominal organs (including gastrointestinal studies), bony thorax, upper extremity and shoulder girdle. Emphasis will be on radiographic terms, anatomy, pathology, positioning, manipulation of radiographic equipment and accessories, and related patient care considerations.

Prerequisites:

- RADT1102

Corequisites:

- RADT1112
- RADT1124

RADT1124 - Radiographic Procedures II ..... ***(4 credits)***
This course will provide the student with the knowledge necessary to perform routine and mobile radiographic procedures relative to the urinary system, lower extremity, pelvis, vertebral column and arthrology. Emphasis will be on radiographic terms, anatomy, pathology, positioning, manipulation of radiographic equipment and accessories, and patient care considerations. Basic techniques in venipuncture, contrast media types, intravenous medication and emergency response will also be included.

Prerequisites:

- RADT1102

Corequisites:

- RADT1112
- RADT1116

RADT1133 - Principles of Radiobiology ..... ***(4 credits)***
This course is designed to establish a basic knowledge of atomic structure and terminology and provide an overview of the principles of radiation protection and interaction with living systems. Also presented are the nature and characteristics of radiation (i.e., its effects on molecules, cells, tissues and the body as a whole, x-ray production and the fundamentals of photon interactions with matter). Radiation health and safety requirements of federal and state regulatory agencies, accreditation agencies, health care organizations and the responsibilities of the radiographer for patients, personnel and the public are also incorporated. Factors affecting biological response are presented, including acute and chronic effects of radiation.

Prerequisites:

- RADT1112
- RADT1116
- RADT1124

Corequisites:

- RADT1140
- RADT1146

RADT1140 - Radiographic Imaging ..... ***(4 credits)***
This course is designed to establish a knowledge base of factors that govern and influence the production and recording of radiographic images as well as provide a basis for analyzing those images. Film and electronic imaging with related accessories will be emphasized. Included are the importance of minimum imaging standards, discussion of problem-solving techniques for image evaluation and the factors that can affect image quality. Class demonstrations/labs are used to demonstrate application. Actual images will be included for analysis.

Prerequisites:

- RADT1112
- RADT1116
- RADT1124

Corequisites:

- RADT1132
- RADT1146

RADT1146 - Radiographic Procedures III ..... ***(4 credits)***
This course will provide the student with the knowledge necessary to perform routine and mobile radiographic procedures relative to skull (including sensory organs), traumatic injury, and surgical radiography. Pathological conditions of these anatomical structures will be discusses as well. In addition the student will be introduced to highly specialized studies of the central nervous system, cardiovascular, lymphatic system and cross-sectional imaging. Special imaging equipment, physical settings and techniques used in these highly specialized studies will also be included.

Prerequisites:

- RADT1112
- RADT1116
- RADT1124

Corequisites:

- RADT1132
- RADT1140

RADT1180 - Radiographic Clinical I ..... ***(5 credits)***
The emphasis of this clinical rotation will be on radiographic positioning and manipulation of radiographic equipment and accessories related to radiography of the thoracic and abdominal viscera, upper and lower extremity, shoulder girdle and pelvis.

Prerequisites:

- RADT1133
- RADT1140
- RADT1146

Corequisites:

- RADT1190

RADT1190 - Radiographic Clinical II ..... ***(5 credits)***
This clinical course emphasizes the basic radiographic procedures and positioning related to the upper and lower gastrointestinal tract and the biliary system. The student also will continue to acquire and build skills in performing radiographic procedures and positioning related to the thoracic and abdominal cavities and the upper and lower extremities, including the shoulder girdle and the pelvis.

Prerequisites:

- RADT1133
- RADT1140
- RADT1146

Corequisites:

- RADT1180

RADT2101 - Radiographic Clinical III ..... ***(4 credits)***
This clinical course emphasizes the basic radiographic procedures and positioning related to the urinary system, the bony thorax and the vertebral column. The student is also introduced to radiographic exposure factors and off-peak (e.g. evening and weekend) clinical hours.

Prerequisites:

- RADT1180
- RADT1190

Corequisites:

- RADT2110
- RADT2224

RADT2110 - Radiographic Clinical IV ..... ***(5 credits)***
This clinical course emphasizes the basic radiographic procedures and positioning related to the skull, facial bones, paranasal sinuses and detailed areas of the skull. This clinical experience provides an opportunity to work with increased independence.

Prerequisites:

- RADT1180
- RADT1190

Corequisites:

- RADT2101
- RADT2224

RADT2120 - Radiographic Clinical V ..... ***(5 credits)***
This clinical course provides the student with the opportunity to function more independently in all areas of basic radiography and to develop clinical skills in regular radiographic areas and procedures, with continuing experience in trauma and surgical procedures. The student will be exposed to special procedures and will begin rotations through the specialized areas of nuclear medicine, radiation therapy, computerized tomography, ultrasound and magnetic resonance imaging.

Prerequisites:

- RADT2101
- RADT2110
- RADT2224

Corequisites:

- RADT2130
- RADT2280

RADT2130 - Radiographic Clinical VI ..... ***(5 credits)***
This clinical course emphasizes the development of independence, discretion and judgment while performing basic radiographic procedures. It provides the student with the opportunity to function as a nearly registry-eligible radiographer. The student is expected to correlate all clinical and didactic experiences while demonstrating a high degree of proficiency and efficiency.

Prerequisites:

- RADT2101
- RADT2110
- RADT2224

Corequisites:

- RADT2120
- RADT2280

RADT2224 - Imaging Equipment ..... ***(4 credits)***
This course is designed to establish a knowledge base in radiographic, fluoroscopic, mobile and tomographic equipment (including computed tomography) requirements and design including circuitry of the x-ray machine. The content will also provide a basic knowledge of quality control. Computer applications in the radiologic sciences related to image capture, display, storage and distribution are presented, as well.

Prerequisites:

- RADT1180
- RADT1190

Corequisites:

- RADT2101
- RADT2110

RADT2280 - Radiologic Technology Registry Review ..... ***(2 credits)***
This course is designed to prepare the student to write the national board exam administered by the American Registry of Radiologic Technologists (ARRT). A review of all course work presented in the program with an emphasis on the ARRT exam specifications will be presented.

Prerequisites:

- RADT2101
- RADT2110
- RADT2224

Corequisites:

- RADT2120
- RADT2130

RADIOLOGIC TECHNOLOGY

ASSOCIATE OF APPLIED SCIENCE (AAS) – 79 CREDITS

Program Plan — "Primary"

Locations: Detroit Lakes

1st Fall Term (12 credits)

Courses

Course	Crds
BIOL2260 - Human Anatomy and Physiology I	3
MATH1114 - College Algebra	4
PHYS1105 - Fundamental Concepts in Physics	3
RADT1102 - Fundamental Concepts of Radiologic Technology	2

1st Spring Term (6 credits)

Courses

Course	Crds
BIOL2262 - Human Anatomy and Physiology II	3
COMM1140 - Interpersonal Communication	3

2nd Fall Term (13 credits)

Courses

Course	Crds
RADT1112 - Introduction to Radiologic Technology and Patient Care	4
RADT1116 - Radiographic Procedures I	5
RADT1124 - Radiographic Procedures II	4

2nd Spring Term (12 credits)

Courses

Course	Crds
RADT1133 - Principles of Radiobiology	4
RADT1140 - Radiographic Imaging	4
RADT1146 - Radiographic Procedures III	4

2nd Summer Term (10 credits)

Courses

Course	Crds
RADT1180 - Radiographic Clinical I	5
RADT1190 - Radiographic Clinical II	5

3rd Fall Term (14 credits)

Courses

Course	Crds
RADT2101 - Radiographic Clinical III	4
RADT2110 - Radiographic Clinical IV	5
RADT2224 - Imaging Equipment	4

3rd Spring Term (12 credits)

Courses

Course	Crds
RADT2120 - Radiographic Clinical V	5
RADT2130 - Radiographic Clinical VI	5
RADT2280 - Radiologic Technology Registry Review	2