Radiation Sciences, BS

The Radiation Sciences Program offers two paths toward completing the major:

- an on-campus program in radiologic technology, diagnostic medical sonography, or radiation therapy for students who have not completed a radiation sciences modality; or
- an online program for registered radiologic technologists and nuclear medicine technologists who would like to earn a Bachelor of Science degree by distance education.

Undergraduate study in radiation sciences is guided by the academic rules and procedures outlined under Undergraduate Rules and Procedures in the Carver College of Medicine section of the catalog.

Requirements

The Bachelor of Science with a major in radiation sciences requires a minimum of 120 s.h. Work for the on-campus degree includes a set of courses that are prerequisite to entering the radiation sciences major, completion of one of eight radiation sciences professional programs, and elective coursework sufficient to complete the minimum of 120 s.h. required for graduation. Students must complete the radiation sciences professional program at the University of Iowa. Registered radiologic technologists interested in earning the degree through distance education should see RT to BS (Online) [p. 10] in this section of the catalog.

Admission to the radiation sciences major is competitive and selective; acceptance into a professional program or the major is not guaranteed. Students who wish to enter the major must first be admitted to the University of Iowa as College of Liberal Arts and Sciences (CLAS) students with a radiation sciences interest. As CLAS students, they must apply to the radiation sciences professional program of their choice by Jan. 15 of the year in which they wish to enter; see Apply on the Radiation Sciences Program website. Transfer students are encouraged to apply in early November to allow time for transfer course articulation. Accepted students enter a professional program, the radiation sciences major, and the Carver College of Medicine the following fall semester.

Applicants for admission to the University of Iowa whose first language is not English are strongly encouraged to complete the University of Iowa English Proficiency Evaluation and satisfy the university's English Proficiency Requirements before they apply to a professional program. Students must have permission to register for a full academic load before they may be admitted to a radiation sciences professional program.

The radiation sciences major requires students to complete a minimum of two years of a high school world language prior to admission.

For additional information on UI admission requirements, contact University of Iowa Admissions.

First-year and transfer applicants admitted to the College of Liberal Arts and Sciences as radiation sciences interest students must complete all courses that are prerequisites to the radiation sciences major (including approved transfer equivalents) by June 1 before they may begin one of the radiation sciences professional programs and enter the major. The only exception to this deadline is that the physics course required for the diagnostic medical sonography program may be completed in the summer session. Prerequisite courses vary slightly depending on which professional program a student wishes to enter.

Students who have declared a radiation sciences interest but have not yet applied and been accepted to a professional program are advised at the University of Iowa Academic Advising Center. After they have been accepted to a professional program, they are advised by the Radiation Sciences Office of Student Affairs.

Upon successful completion of the professional program, students are eligible to apply for national certification exams for their program's specialty area(s). Once they have completed the professional program and all other requirements for graduation, they are granted a Bachelor of Science degree.

The Bachelor of Science with a major in radiation sciences requires the following coursework.

Prerequisites to the Radiation Sciences Major

Students must complete the following prerequisite courses (28–33 s.h.) by the end of the spring semester before they enter the program and the major. Students may complete physics for the sonography program in the summer. Additionally, students must have earned an overall cumulative college grade-point average (GPA) of at least 2.50, a UI GPA of at least 2.00, and a 2.00 term GPA in the spring/summer semesters immediately preceding the start of the professional program. Students who wish to enter either of the two-year professional programs (radiologic technology or radiation therapy) must complete a total of 60 s.h. of college coursework, including the following prerequisites, by the end of the spring semester before they enter the program and the major.

Students are advised for success based on academic strength, not necessarily for a four-year plan. Prerequisite courses for the three-year professional programs (multi-credentialed radiologic technology and diagnostic medical sonography) may take more than one year to complete. Prerequisite courses for the radiologic technology and radiation therapy professional programs may take more than two years to complete.

Rhetoric

Course #	Title	Hours
This course:		
RHET:1030	Rhetoric: Writing and Communication	4

Anatomy

Course #	Title	Hours
One of these:		
HHP:2100	Human Anatomy	3
HHP:3105	Anatomy for Human Physiology	3
HHP:3115	Anatomy for Human Physiology With Lab	5

Physiology

Course #	Title	Hours
One of these:		
HHP:2400	Fundamentals of Human Physiology	3
HHP:3500	Human Physiology	3
HHP:3550	Human Physiology With Laboratory	5

Physics

Course #	Title	Hours
Students interested in diagnostic medical sonography or radiation therapy programs complete one of these:		
PHYS:1400	Basic Physics	3-4
PHYS:1511	College Physics I	4

Quantitative or Formal Reasoning

Course #	Title	Hours
One of these:		
MATH:1020	Elementary Functions	4
MATH:1440	Mathematics for the Biological Sciences	4

Psychology

Course #	Title	Hours
This course:		
PSY:1001	Elementary Psychology	3

Medical Terminology

Course #	Title	Hours
This course:		
CLSA:3750	Medical and Technical Terminology	2

Culture, Society, and the Arts

Two courses for 3 s.h. each in two of these areas.

- Understanding Cultural Perspectives
- Historical Perspectives
- International and Global Issues
- Literary, Visual, and Performing Arts
- Values and Society

See GE CLAS Core (College of Liberal Arts and Sciences) in the catalog for approved courses in the areas listed.

Recommended Pre-Major Work

The Radiation Sciences Program recommends that before students submit an application to a radiation sciences professional program and the major, they job-shadow a professional who works in their area of interest and gain hands-on patient care experience. Each professional program lists recommended courses that may be completed in addition to the required courses.

Electives

In order to earn the minimum of 120 s.h. required for graduation, students may need to complete elective coursework in addition to the prerequisite coursework listed and one of the professional programs in medical imaging. They should plan their elective courses in consultation with their advisor.

Radiation Sciences Professional Programs

Students must complete one of the following on-campus radiation sciences professional programs at University of Iowa Health Care:

- radiologic technology [p. 4];
- radiologic technology and breast imaging [p. 4];
- radiologic technology and cardiovascular interventional [p. 4];
- radiologic technology and computed tomography [p. 4];
- radiologic technology and magnetic resonance imaging [p. 4];
- diagnostic medical sonography and cardiac/vascular [p. 2];
- diagnostic medical sonography and general/vascular [p. 2]; or
- radiation therapy [p. 9].

Each program offers modality-specific didactic and supervised clinical education courses. Graduates of the professional programs and associated internships are eligible to apply for one or more certification exams.

The diagnostic medical sonography programs span three years, the radiation therapy program spans two years, and the radiologic technology programs span two or three years. Each program begins in the fall.

Admission to all radiation sciences professional programs is competitive; each program accepts a limited number of students and acceptance is not guaranteed.

Students participating in clinical rotations at non-UI Health Care facilities as part of their professional program are required to meet the immunization and testing requirements of those facilities in addition to those required at UI Health Care locations.

Diagnostic Medical Sonography

A diagnostic medical sonographer is a skilled professional who uses high-frequency sound wave equipment to create diagnostic images and data that assist health care professionals in their diagnosis of patients with disease. Ultrasound imaging is used on many parts of the body, including the abdomen, heart, blood vessels, and the developing fetus of a pregnant person. When determining normal and abnormal findings, the sonographer must demonstrate sectional anatomy through transducer manipulation. The sonographer uses independent judgment in recognizing the need to extend the scope of the study according to the diagnostic findings. The sonographer spends extended time with the patient obtaining a thorough history of symptoms, explaining the exam, answering questions, and performing the exam.

Each of the radiation sciences diagnostic medical sonography (DMS) degree tracks consists of two professional programs —DMS and cardiac and vascular sonography or DMS and general and vascular sonography. Each of these three-year programs is selective and competitive; acceptance is not guaranteed. Students must satisfy all UI admission requirements, complete all prerequisites, and be accepted

into the diagnostic medical sonography professional program following an application and selection process; see Diagnostic Medical Sonography on the Radiation Sciences Program website.

Diagnostic Medical Sonography and Cardiac and Vascular Sonography

The diagnostic medical sonography program in cardiac and vascular sonography provides a multispecialty education in cardiac (echocardiography) and vascular sonography (ultrasound imaging). Students learn about sonographic imaging and evaluation, hemodynamics and Doppler evaluation, sonography equipment, sectional anatomy, pathology, patient care, medical ethics, emotional intelligence, research methodologies, and quality management. They become proficient in using sonographic imaging equipment and in performing cardiac and vascular sonographic procedures, including invasive procedures, emergency exams, and 3D imaging. They also participate in supervised clinical education. An elective course and lab in pediatric cardiac sonography and an elective course in fetal cardiac sonography are available.

Upon completing the program, graduates are eligible to apply for the national certification exams in diagnostic medical sonography in the specialty areas of cardiac (echocardiography) and vascular technology.

Students who have completed all prerequisite courses by June 1 (except physics, which may be completed in the summer session) are eligible to apply to this three-year program. Application deadline is Jan. 15. Up to eight students are accepted into this track each year, which begins in the fall.

DMS and Cardiac and Vascular Sonography: Required Courses

Upon acceptance into the diagnostic medical sonography and cardiac and vascular professional program, students will complete required courses and internships during their second, third, and fourth years.

Course #	Title	Hours
All of these:		
RSCI:4110	Vascular Anatomy	3
RSCI:4130	Electrocardiogram and Hemodynamics	3
RSCT:4100	Sectional Anatomy for Imaging Sciences	3
RSMS:3100	Cardiac Sonography I	3
RSMS:3101	Cardiac Sonography I Lab	2
RSMS:3110	Foundations of Sonography	3
RSMS:3111	Foundations of Sonography Lab	1
RSMS:3115	Diagnostic Medical Sonography Clinical Internship I	1
RSMS:3140	Vascular Sonography I	3
RSMS:3141	Vascular Sonography I Lab	1
RSMS:3150	Cardiac Physiology and Hemodynamics	3
RSMS:3205	Cardiac Sonography II	3
RSMS:3206	Cardiac Sonography II Lab	1
RSMS:3215	Diagnostic Medical Sonography Clinical Internship II	3
RSMS:3230	Sonography Principles, Physics, and Instrumentation	3
RSMS:3231	Sonography Principles, Physics, and Instrumentation Lab	1
RSMS:3270	Vascular Sonography II	3
RSMS:3315	Diagnostic Medical Sonography Clinical Internship III	3
RSMS:3376	Vascular Sonography II Lab	1
RSMS:4110	Advanced Sonography	3
RSMS:4111	Advanced Sonography Lab	1
RSMS:4115	Diagnostic Medical Sonography Clinical Internship IV	5
RSMS:4120	Advanced Cardiac Sonography	3
RSMS:4121	Advanced Cardiac Sonography Lab	1
RSMS:4215	Diagnostic Medical Sonography Clinical Internship V	5
RSMS:4220	Multidisciplinary Capstone Seminar	3
RSP:2110	Pathology for Radiation Sciences	2
RSP:2120	Patient Care for the Radiation Sciences	3
RSP:3210	Medical Ethics and Law	2
RSP:3220	Radiation Sciences Quality Management and Health Care Administration	2
RSP:4110	Research Methodology for Radiation Sciences	3
RSRT:3220	Emotional Intelligence for the Health Care Professional	2
Electives		
RSMS:3305	Pediatric Cardiac Sonography	3
RSMS:3306	Pediatric Cardiac Sonography Laboratory	1
RSMS:4210	Fetal Cardiac Sonography	3

Diagnostic Medical Sonography and General and Vascular Sonography

The diagnostic medical sonography program in general and vascular sonography provides a multispecialty education in obstetrical, abdominal, and vascular sonography (ultrasound imaging). Students learn about sonographic imaging and evaluation, hemodynamics and Doppler evaluation, sonography equipment, sectional anatomy, pathology, patient care, medical ethics, emotional intelligence, research methodologies, and quality management. They become proficient in using sonographic imaging equipment and in performing obstetrical and gynecological, abdominal, and vascular sonographic procedures, including invasive procedures, emergency exams, pediatric sonography, and 3D imaging. They also participate in supervised clinical

education. An elective course in breast sonography and fetal cardiac sonography is available.

Upon completing the program, graduates are eligible to apply for the national certification exams in diagnostic medical sonography in the specialty areas of obstetrics and gynecology, abdomen, and vascular technology.

Students who will have completed all prerequisite courses by June 1 (except physics, which may be completed in the summer session) are eligible to apply to this three-year program. Application deadline is Jan. 15. Up to 12 students are accepted into this track each year, which begins in the fall.

DMS and General and Vascular Sonography: Required Courses

Upon acceptance into the diagnostic medical sonography and general and vascular professional program, students will complete required courses and internships during their second, third, and fourth years.

Course #	Title	Hours
All of these:		
RSCI:4110	Vascular Anatomy	3
RSCI:4130	Electrocardiogram and Hemodynamics	3
RSCT:4100	Sectional Anatomy for Imaging Sciences	3
RSMS:3110	Foundations of Sonography	3
RSMS:3111	Foundations of Sonography Lab	1
RSMS:3115	Diagnostic Medical Sonography Clinical Internship I	1
RSMS:3120	Abdominal Sonography I	3
RSMS:3121	Abdominal Sonography I Lab	1
RSMS:3130	Obstetrical and Gynecological Sonography I	3
RSMS:3131	Obstetrical and Gynecological Sonography I Lab	1
RSMS:3140	Vascular Sonography I	3
RSMS:3141	Vascular Sonography I Lab	1
RSMS:3215	Diagnostic Medical Sonography Clinical Internship II	3
RSMS:3230	Sonography Principles, Physics, and Instrumentation	3
RSMS:3231	Sonography Principles, Physics, and Instrumentation Lab	1
RSMS:3240	Abdominal Sonography II	3
RSMS:3250	Obstetrical and Gynecological Sonography II	3
RSMS:3270	Vascular Sonography II	3
RSMS:3300	Pediatric Sonography	3
RSMS:3315	Diagnostic Medical Sonography Clinical Internship III	3
RSMS:3325	Abdominal Sonography II Lab	1
RSMS:3376	Vascular Sonography II Lab	1
RSMS:4110	Advanced Sonography	3
RSMS:4111	Advanced Sonography Lab	1
RSMS:4115	Diagnostic Medical Sonography Clinical Internship IV	5
RSMS:4215	Diagnostic Medical Sonography Clinical Internship V	5
RSMS:4220	Multidisciplinary Capstone Seminar	3
RSP:2110	Pathology for Radiation Sciences	2
RSP:2120	Patient Care for the Radiation Sciences	3
RSP:3210	Medical Ethics and Law	2
RSP:3220	Radiation Sciences Quality Management and Health Care Administration	2
RSP:4110	Research Methodology for Radiation Sciences	3
RSRT:3220	Emotional Intelligence for the Health Care Professional	2
Electives		
RSMS:3260	Breast Sonography	2
RSMS:4210	Fetal Cardiac Sonography	3

DMS Recommended Pre-Major Work

The following courses are recommended prior to DMS program application.

Course #	Title	Hours
All of these:		
RSP:1100	Introduction to the Radiation Sciences	1
PSY:1010	Your Brain Unlocked: Learning About Learning	1
STAT:1020	Elementary Statistics and Inference	3
One of these:		
BIOL:1140	Human Biology: Nonmajors	4
HHP:1400	Human Anatomy and Physiology	3
One of these:		
BAIS:1500	Business Computing Essentials	2
CS:1020	Principles of Computing	3

Radiologic Technology

A radiologic technologist is a healthcare professional who specializes in the imaging of human anatomy for diagnosis and treatment. Radiographers prepare patients for the imaging exams, move patients into the correct position for their imaging, and operate specialized equipment. Radiographers work in many different settings including hospitals, medical labs, doctor offices, and outpatient centers. Areas of specialization include bone densitometry, cardiac interventional radiography (CI), computed tomography (CT), magnetic resonance imaging (MRI), mammography, radiography, and vascular interventional radiography (VI).

The radiation sciences radiologic technology degree tracks consist of five professional programs. Up to 25 students are accepted into the radiologic technology program each year.

- Radiologic Technology [p. 5]
- Radiologic Technology and Breast Imaging [p. 5]
- Radiologic Technology and Cardiovascular Interventional [p. 6]
- Radiologic Technology and Computed Tomography [p. 7]
- Radiologic Technology and Magnetic Resonance Imaging [p. 8]

Each of these two- or three-year programs is selective and competitive; acceptance is not guaranteed. Students must satisfy all UI admission requirements, complete all prerequisites, and be accepted into a radiologic technology professional program following an application and selection process; see Radiologic Technology on the Radiation Sciences Program website.

Radiologic Technology

The radiologic technology (RT) program provides education in pathology, radiation biology, radiation protection, patient care, sectional anatomy, emotional intelligence, medical ethics, medical research, quality management, and health care administration. Students learn about radiographic procedures, imaging and evaluations, imaging equipment, quality assurance, and clinical education in radiography. Clinical education takes place in a variety of medical imaging sites and includes day, evening, and weekend obligations at clinical locations that are geographically dispersed.

Upon completion of the program, graduates are eligible to apply for the national certification exam in radiography.

Students who will have completed a total of 60 s.h., including prerequisite courses by June 1, are eligible to apply to this program. Students typically apply to this two-year program during their second year and begin in fall of their junior year. Application deadline is Jan. 15.

RT: Required Courses

Upon acceptance into this radiologic technology professional program, students will complete required courses and internships during their third and fourth years.

Course #	Title	Hours
All of these:		
RSCT:4100	Sectional Anatomy for Imaging Sciences	3
RSP:1100	Introduction to the Radiation Sciences	1
RSP:2110	Pathology for Radiation Sciences	2
RSP:2120	Patient Care for the Radiation Sciences	3
RSP:3130	Introduction to Radiation Safety and Radiobiology	1
RSP:3210	Medical Ethics and Law	2
RSP:3220	Radiation Sciences Quality Management and Health Care Administration	2
RSP:4110	Research Methodology for Radiation Sciences	3
RSRT:2120	Radiologic Technology Clinical Internship I	1
RSRT:2130	Radiographic Procedures I	2
RSRT:2140	Radiographic Analysis I	1
RSRT:2141	Radiographic Procedures and Analysis I Lab	1
RSRT:2225	Radiologic Technology Clinical Internship II	3
RSRT:2230	Radiographic Procedures II	3
RSRT:2240	Radiographic Analysis II	2
RSRT:2241	Radiographic Procedures and Analysis II Lab	1
RSRT:2250	Radiographic Fluoroscopic Procedures	2
RSRT:2251	Radiographic Fluoroscopic Procedures Lab	1
RSRT:2325	Radiologic Technology Clinical Internship III	3
RSRT:3110	Radiographic Analysis III	1
RSRT:3111	Radiographic Procedures and Analysis III Lab	1
RSRT:3120	Radiographic Procedures III	2
RSRT:3125	Radiologic Technology Clinical Internship IV	4
RSRT:3132	Radiation Safety in Radiologic Technology	1
RSRT:3140	Radiographic and Digital Imaging	3
RSRT:3141	Radiographic and Digital Imaging Lab	1
RSRT:3220	Emotional Intelligence for the Health Care Professional	2
RSRT:3225	Radiologic Technology Clinical Internship V	3
RSRT:3230	Radiographic Physics and Imaging Equipment	3
RSRT:3231	Radiographic Physics and Imaging Equipment Lab	1
RSRT:4230	Radiologic Technology Capstone and Certification Exam Preparation	2

Radiologic Technology and Breast Imaging

Students participate in the radiologic technology curriculum as previously stated for the first two years.

The breast imaging (BI) component provides didactic education in patient care procedures, pathology, anatomy, imaging procedures and analysis, Mammography Quality Standards Act (MQSA) quality control, and image acquisition principles. Students become acquainted with imaging equipment, study quality assurance, and participate in supervised clinical education in radiography and breast imaging.

Upon completion of the program, graduates are eligible to apply for the national certification exams in radiography and mammography.

Students who will have completed all prerequisite courses by June 1 are eligible to apply to this program. Students typically apply to this three-year program during their first year and begin in the fall of their sophomore year. Application deadline is Jan. 15.

RT and Breast Imaging: Required Courses

Upon acceptance into the radiologic technology and breast imaging professional program, students will complete required courses and internships during their second, third, and fourth years.

Course #	Title	Hours
All of these:		
RSBI:3310	Patient Care for Breast Imaging	3
RSBI:3315	Breast Imaging Clinical Internship I	2
RSBI:4110	Breast Imaging Procedures and Analysis	3
RSBI:4115	Breast Imaging Clinical Internship II	4
RSBI:4120	Anatomy and Pathology for Breast Imaging	2
RSBI:4130	Breast Imaging Acquisitions and Principles	2
RSBI:4210	Breast Imaging Advanced Procedures and Analysis	3
RSBI:4215	Breast Imaging Clinical Internship III	4
RSBI:4220	Quality Control in Breast Imaging	3
RSCI:4110	Vascular Anatomy	3
RSCT:4100	Sectional Anatomy for Imaging Sciences	3
RSP:2110	Pathology for Radiation Sciences	2
RSP:2120	Patient Care for the Radiation Sciences	3
RSP:3130	Introduction to Radiation Safety and Radiobiology	1
RSP:3210	Medical Ethics and Law	2
RSP:3220	Radiation Sciences Quality Management and Health Care Administration	2
RSP:4110	Research Methodology for Radiation Sciences	3
RSRT:2120	Radiologic Technology Clinical Internship I	1
RSRT:2130	Radiographic Procedures I	2
RSRT:2140	Radiographic Analysis I	1
RSRT:2141	Radiographic Procedures and Analysis I Lab	1
RSRT:2225	Radiologic Technology Clinical Internship II	3
RSRT:2230	Radiographic Procedures II	3
RSRT:2240	Radiographic Analysis II	2
RSRT:2241	Radiographic Procedures and Analysis II Lab	1
RSRT:2250	Radiographic Fluoroscopic Procedures	2
RSRT:2251	Radiographic Fluoroscopic Procedures Lab	1
RSRT:2325	Radiologic Technology Clinical Internship III	3
RSRT:3110	Radiographic Analysis III	1
RSRT:3111	Radiographic Procedures and Analysis III Lab	1
RSRT:3120	Radiographic Procedures III	2
RSRT:3125	Radiologic Technology Clinical Internship IV	4
RSRT:3132	Radiation Safety in Radiologic Technology	1
RSRT:3140	Radiographic and Digital Imaging	3
RSRT:3141	Radiographic and Digital Imaging Lab	1
RSRT:3220	Emotional Intelligence for the Health Care Professional	2
RSRT:3225	Radiologic Technology Clinical Internship V	3
RSRT:3230	Radiographic Physics and Imaging Equipment	3
RSRT:3231	Radiographic Physics and Imaging Equipment Lab	1
RSRT:3325	Radiologic Technology Clinical Internship VI	2
RSRT:4125	Radiologic Technology Clinical Internship VII	1
RSRT:4225	Radiologic Technology Clinical Internship VIII	1
RSRT:4230	Radiologic Technology Capstone and Certification Exam Preparation	2

Radiologic Technology and Cardiovascular Interventional

Students participate in the radiologic technology curriculum as stated previously for the first two years.

The cardiovascular interventional (CVI) component provides didactic education in imaging equipment, pharmacology, sterile techniques, cardiac monitoring, vascular anatomy and physiology; cardiovascular, peripheral, and neurological procedures and pathology; therapeutic intervention techniques; and digital angiography. Students become acquainted with imaging equipment, study quality assurance, and participate in supervised clinical education in radiography, cardiac interventional, and peripheral and neurological interventional.

Upon completion of the program, graduates are eligible to apply for the national certification exams in radiography, vascular interventional technology, and cardiac interventional technology.

Students who will have completed all prerequisite courses by June 1 are eligible to apply to this program. Students typically apply to this three-year program during their first year and begin in fall of their sophomore year. Application deadline is Jan. 15.

RT and Cardiovascular Interventional: Required Courses

Upon acceptance into the radiologic technology and cardiovascular interventional professional program, students will complete required courses and internships during their second, third, and fourth years.

Course #	Title	Hours
All of these:		
RSCI:4110	Vascular Anatomy	3
RSCI:4120	CVI Principles	4
RSCI:4130	Electrocardiogram and Hemodynamics	3
RSCI:4140	CVI Peripheral Procedures and Pathology	3
RSCI:4150	CVI Neurology and Nonvascular Procedures and Pathology	3
RSCI:4160	CVI Cardiac Procedures and Pathology	4
RSCI:4170	CVI Clinical Internship III	4
RSCI:4180	CVI Clinical Internship II	4
RSCI:4190	CVI Clinical Internship I	2
RSCT:4100	Sectional Anatomy for Imaging Sciences	3
RSP:2110	Pathology for Radiation Sciences	2
RSP:2120	Patient Care for the Radiation Sciences	3
RSP:3130	Introduction to Radiation Safety and Radiobiology	1
RSP:3210	Medical Ethics and Law	2
RSP:3220	Radiation Sciences Quality Management and Health Care Administration	2
RSP:4110	Research Methodology for Radiation Sciences	3
RSRT:2120	Radiologic Technology Clinical Internship I	1
RSRT:2130	Radiographic Procedures I	2
RSRT:2140	Radiographic Analysis I	1
RSRT:2141	Radiographic Procedures and Analysis I Lab	1
RSRT:2225	Radiologic Technology Clinical Internship II	3
RSRT:2230	Radiographic Procedures II	3
RSRT:2240	Radiographic Analysis II	2
RSRT:2241	Radiographic Procedures and Analysis II Lab	1
RSRT:2250	Radiographic Fluoroscopic Procedures	2
RSRT:2251	Radiographic Fluoroscopic Procedures Lab	1
RSRT:2325	Radiologic Technology Clinical Internship III	3
RSRT:3110	Radiographic Analysis III	1
RSRT:3111	Radiographic Procedures and Analysis III Lab	1
RSRT:3120	Radiographic Procedures III	2
RSRT:3125	Radiologic Technology Clinical Internship IV	4
RSRT:3132	Radiation Safety in Radiologic Technology	1
RSRT:3140	Radiographic and Digital Imaging	3
RSRT:3141	Radiographic and Digital Imaging Lab	1
RSRT:3220	Emotional Intelligence for the Health Care Professional	2
RSRT:3225	Radiologic Technology Clinical Internship V	3
RSRT:3230	Radiographic Physics and Imaging Equipment	3
RSRT:3231	Radiographic Physics and Imaging Equipment Lab	1
RSRT:3325	Radiologic Technology Clinical Internship VI	2
RSRT:4125	Radiologic Technology Clinical Internship VII	1
RSRT:4225	Radiologic Technology Clinical Internship VIII	1
RSRT:4230	Radiologic Technology Capstone and Certification Exam Preparation	2

Radiologic Technology and Computed Tomography

Students participate in the radiologic technology curriculum as stated previously for the first two years.

The computed tomography (CT) component provides didactic education in sectional anatomy, multislice CT, dual source CT, electron beam CT, physiologic and 3D imaging, CT simulation, physics and imaging, and procedures and pathology. Students become acquainted with imaging equipment, study quality assurance, and participate in supervised clinical education in radiography and computed tomography.

Upon completion of the program, graduates are eligible to apply for the national certification exams in radiography and computed tomography.

Students who will have completed all prerequisite courses by June 1 are eligible to apply to this program. Students typically apply to this three-year program during their first year and begin in fall of their sophomore year. Application deadline is Jan. 15.

RT and Computed Tomography: Required Courses

Upon acceptance into the radiologic technology and computed tomography professional program, students will complete required courses and internships during their second, third, and fourth years.

Course #	Title	Hours
All of these:		
RSCI:4110	Vascular Anatomy	3
RSCI:4130	Electrocardiogram and Hemodynamics	3
RSCT:4100	Sectional Anatomy for Imaging Sciences	3
RSCT:4105	Computed Tomography Clinical Internship I	2
RSCT:4115	Computed Tomography Clinical Internship II	4
RSCT:4120	Computed Tomography Procedures I	4
RSCT:4125	Computed Tomography Procedures II	4
RSCT:4130	Computed Tomography Physical Principles and QC	4

RSCT:4215	Computed Tomography Clinical Internship III	4
RSP:2110	Pathology for Radiation Sciences	2
RSP:2120	Patient Care for the Radiation Sciences	3
RSP:3130	Introduction to Radiation Safety and Radiobiology	1
RSP:3210	Medical Ethics and Law	2
RSP:3220	Radiation Sciences Quality Management and Health Care Administration	2
RSP:4110	Research Methodology for Radiation Sciences	3
RSRT:2120	Radiologic Technology Clinical Internship I	1
RSRT:2130	Radiographic Procedures I	2
RSRT:2140	Radiographic Analysis I	1
RSRT:2141	Radiographic Procedures and Analysis I Lab	1
RSRT:2225	Radiologic Technology Clinical Internship II	3
RSRT:2230	Radiographic Procedures II	3
RSRT:2240	Radiographic Analysis II	2
RSRT:2241	Radiographic Procedures and Analysis II Lab	1
RSRT:2250	Radiographic Fluoroscopic Procedures	2
RSRT:2251	Radiographic Fluoroscopic Procedures Lab	1
RSRT:2325	Radiologic Technology Clinical Internship III	3
RSRT:3110	Radiographic Analysis III	1
RSRT:3111	Radiographic Procedures and Analysis III Lab	1
RSRT:3120	Radiographic Procedures III	2
RSRT:3125	Radiologic Technology Clinical Internship IV	4
RSRT:3132	Radiation Safety in Radiologic Technology	1
RSRT:3140	Radiographic and Digital Imaging	3
RSRT:3141	Radiographic and Digital Imaging Lab	1
RSRT:3220	Emotional Intelligence for the Health Care Professional	2
RSRT:3225	Radiologic Technology Clinical Internship V	3
RSRT:3230	Radiographic Physics and Imaging Equipment	3
RSRT:3231	Radiographic Physics and Imaging Equipment Lab	1
RSRT:3325	Radiologic Technology Clinical Internship VI	2
RSRT:4125	Radiologic Technology Clinical Internship VII	1
RSRT:4225	Radiologic Technology Clinical Internship VIII	1
RSRT:4230	Radiologic Technology Capstone and Certification Exam Preparation	2

Radiologic Technology and Magnetic Resonance Imaging

Students participate in the radiologic technology curriculum as stated previously for the first two years.

The magnetic resonance imaging (MRI) component provides didactic education in patient care procedures, pathophysiology, physics, sectional anatomy, and instrumentation. Students become acquainted with imaging equipment, study quality assurance, and participate in supervised clinical education in radiography and magnetic resonance imaging.

Upon completion of the program, graduates are eligible to apply for the national certification exams in radiography and magnetic resonance imaging.

Students who will have completed all prerequisite courses by June 1 are eligible to apply to this program. Students typically apply to this three-year program during their first year and begin in fall of their sophomore year. Application deadline is Jan. 15.

RT and Magnetic Resonance Imaging: Required Courses

Upon acceptance into the radiologic technology and magnetic resonance imaging professional program, students will complete required courses and internships during their second, third, and fourth years.

Course #	Title	Hours
All of these:		
RSCI:4110	Vascular Anatomy	3
RSCT:4100	Sectional Anatomy for Imaging Sciences	3
RSMR:4110	Fundamentals for the MRI Technologist	3
RSMR:4120	MRI Procedures I	4
RSMR:4130	MRI Procedures II	4
RSMR:4140	MRI Acquisition and Principles I	3
RSMR:4150	MRI Acquisition and Principles II	3
RSMR:4160	MRI Clinical Internship I	2
RSMR:4170	MRI Clinical Internship II	4
RSMR:4175	MRI Clinical Internship III	4
RSP:2110	Pathology for Radiation Sciences	2
RSP:2120	Patient Care for the Radiation Sciences	3
RSP:3130	Introduction to Radiation Safety and Radiobiology	1
RSP:3210	Medical Ethics and Law	2
RSP:3220	Radiation Sciences Quality Management and Health Care Administration	2
RSP:4110	Research Methodology for Radiation Sciences	3
RSRT:2120	Radiologic Technology Clinical Internship I	1
RSRT:2130	Radiographic Procedures I	2
RSRT:2140	Radiographic Analysis I	1

RSRT:2141	Radiographic Procedures and Analysis I Lab	1
RSRT:2225	Radiologic Technology Clinical Internship II	3
RSRT:2230	Radiographic Procedures II	3
RSRT:2240	Radiographic Analysis II	2
RSRT:2241	Radiographic Procedures and Analysis II Lab	1
RSRT:2250	Radiographic Fluoroscopic Procedures	2
RSRT:2251	Radiographic Fluoroscopic Procedures Lab	1
RSRT:2325	Radiologic Technology Clinical Internship III	3
RSRT:3110	Radiographic Analysis III	1
RSRT:3111	Radiographic Procedures and Analysis III Lab	1
RSRT:3120	Radiographic Procedures III	2
RSRT:3125	Radiologic Technology Clinical Internship IV	4
RSRT:3132	Radiation Safety in Radiologic Technology	1
RSRT:3140	Radiographic and Digital Imaging	3
RSRT:3141	Radiographic and Digital Imaging Lab	1
RSRT:3220	Emotional Intelligence for the Health Care Professional	2
RSRT:3225	Radiologic Technology Clinical Internship V	3
RSRT:3230	Radiographic Physics and Imaging Equipment	3
RSRT:3231	Radiographic Physics and Imaging Equipment Lab	1
RSRT:3325	Radiologic Technology Clinical Internship VI	2
RSRT:4125	Radiologic Technology Clinical Internship VII	1
RSRT:4225	Radiologic Technology Clinical Internship VIII	1
RSRT:4230	Radiologic Technology Capstone and Certification Exam Preparation	2

RT Recommended Pre-Major Work

The following courses are recommended prior to RT program application.

Course #	Title	Hours
All of these:		
RSP:1100	Introduction to the Radiation Sciences (required for two-year radiologic technology track)	1
PHYS:1400	Basic Physics	3-4
PSY:1010	Your Brain Unlocked: Learning About Learning	1
STAT:1020	Elementary Statistics and Inference	3
One of these:		
BIOL:1140	Human Biology: Nonmajors	4
HHP:1400	Human Anatomy and Physiology	3
One of these:		
BAIS:1500	Business Computing Essentials	2
CS:1020	Principles of Computing	3

Radiation Therapy

A radiation therapist is a healthcare professional specializing in the administration of radiation treatments to patients with cancer and certain benign conditions. As part of a multidisciplinary team, they work closely with radiation oncologists, medical physicists, dosimetrists, and oncology nurses.

A radiation therapist's primary duties include treatment delivery, patient care, equipment operation, and treatment planning.

Radiation therapists play a critical role in cancer care, combining technical expertise with patient-centered care to improve treatment outcomes. They typically work in hospitals, cancer treatment centers, and freestanding clinics. With additional education and experience, radiation therapists can advance to roles such as dosimetrists, educators, researchers, or leadership and administrative positions.

Admission to this two-year program is selective and competitive; acceptance is not guaranteed. Students must satisfy all UI admission requirements, complete all prerequisites, and be accepted into the radiation therapy professional program following an application and selection process. See the Radiation Sciences website for more information.

Radiation Therapy

The radiation therapy professional program teaches the theory and techniques of radiation therapy technology, with emphasis on competence in areas of oncology treatment planning, treatment delivery, dosimetry, and use of megavoltage radiation-producing equipment to administer treatment. Students participate in clinical education in radiation therapy. Radiation therapy students also complete coursework in sectional anatomy, computed tomography (CT) procedures and physics, and magnetic resonance imaging (MRI) fundamentals.

Upon completing the program, graduates are eligible to apply for the national certification exam in radiation therapy. Students will have also completed didactic coursework for the national certification exam in CT and MRI, but not the clinical component.

Students who have completed a total of 60 s.h., including prerequisite courses by June 1, are eligible to apply to this program. Students typically apply to this two-year program during their second year and begin it in the fall of their junior year. The application deadline is Jan. 15.

The radiation therapy program accepts up to ten students each year into one of the two track options. Students in both tracks attend didactic classes on campus in Iowa City during their junior year and online during their senior year.

Radiation Therapy: Required Courses

Upon acceptance into the radiation therapy professional program, students will complete required courses and internships during their third and fourth years.

Course #	Title	Hours
All of these:		
RSCT:4100	Sectional Anatomy for Imaging Sciences	3
RSCT:4120	Computed Tomography Procedures I	4
RSCT:4130	Computed Tomography Physical Principles and QC	4
RSMR:4110	Fundamentals for the MRI Technologist	3
RSP:2110	Pathology for Radiation Sciences	2
RSP:2120	Patient Care for the Radiation Sciences	3
RSP:3130	Introduction to Radiation Safety and Radiobiology	1
RSP:3210	Medical Ethics and Law	2
RSP:3220	Radiation Sciences Quality Management and Health Care Administration	2
RSP:4110	Research Methodology for Radiation Sciences	3
RSTH:3100	Introduction to Radiation Therapy	2
RSTH:3101	Introduction to Radiation Therapy Lab	1
RSTH:3110	Medical Physics I	2
RSTH:3120	Radiation Therapy Clinical Internship I	3
RSTH:3132	Radiobiology in Radiation Therapy	1
RSTH:3205	Principles of Radiation Therapy I	3
RSTH:3206	Principles of Radiation Therapy I Lab	1
RSTH:3215	Medical Physics II	2
RSTH:3225	Radiation Therapy Clinical Internship II	3
RSTH:3325	Radiation Therapy Clinical Internship III	4
RSTH:4105	Principles of Radiation Therapy II	2
RSTH:4125	Radiation Therapy Clinical Internship IV	4
RSTH:4225	Radiation Therapy Clinical Internship V	5
RSTH:4230	Radiation Therapy Capstone	3

Radiation Therapy Recommended Pre-Major Work

The following courses are recommended prior to applying to the radiation therapy program.

Course #	Title	Hours
All of these:		
RSP:1100	Introduction to the Radiation Sciences	1
HHP:2110	Human Anatomy Laboratory	1
PSY:1010	Your Brain Unlocked: Learning About Learning	1
STAT:1020	Elementary Statistics and Inference	3
One of these:		
BIOL:1140	Human Biology: Nonmajors	4
HHP:1400	Human Anatomy and Physiology	3
One of these:		
BAIS:1500	Business Computing Essentials	2
CS:1020	Principles of Computing	3

RT to BS (Online)

The RT to BS is an online program designed for registered radiologic technologists and nuclear medicine technologists who wish to earn a Bachelor of Science degree with a major in radiation sciences by distance education. The program requires a minimum of 120 s.h. Students who successfully complete a radiologic technology (RT) or a nuclear medicine technology (NMT) program and pass the board certification exam are awarded 60 s.h. of credit. They are also awarded credit for equivalent coursework that is prerequisite to entering the major. Upon admission to the major, students complete a second modality online, with or without a practicum.

Students choose coursework in any of the five online modalities: breast imaging (BI), cardiovascular interventional (CVI), computed tomography (CT), or magnetic resonance imaging (MRI). This program of study does not require a practicum. However, practicum opportunities at University of Iowa Health Care may be available for application. Acceptance into a practicum is not guaranteed. For more information, visit the Radiation Sciences website.

In order to be admitted to the radiation sciences major, students must pass the American Registry of Radiologic Technologists (ARRT) radiography (R), ARRT nuclear medicine technology (N), or Nuclear Medicine Technology Certification Board (NMTCB) exam. They must also have completed all coursework prerequisite to entering the major with a grade-point average of at least 2.50, not including RT or NMT program courses. Students may count approved transfer credit toward the required prerequisites; learn more by visiting Transfer Courses on MyUI.

Applicants for admission to the University of Iowa whose first language is not English are strongly encouraged to complete the university's English Proficiency Evaluation and satisfy the university's English Proficiency Requirements.

The radiation sciences major requires students to complete a minimum of two years of a high school world language prior to admission.

For additional information on UI admission requirements, contact the University of Iowa Admissions.

Prerequisites to the Radiation Sciences Major

In addition to the completion of an RT or NMT program, students must complete the following prerequisite courses (25–29 s.h.) before they may enter the radiation sciences major.

Rhetoric

Course #	Title	Hours
RHET:1030	Rhetoric: Writing and Communication	4

Anatomy

Course #	Title	Hours
One of these:		
HHP:2100	Human Anatomy	3
HHP:3105	Anatomy for Human Physiology	3
HHP:3115	Anatomy for Human Physiology With Lab	5

Natural Sciences

Course #	Title	Hours
One of these:		
BIOL:1140	Human Biology: Nonmajors	4
CHEM:1070	General Chemistry I	3
CHEM:1110	Principles of Chemistry I	4
HHP:2400	Fundamentals of Human Physiology	3
HHP:3500	Human Physiology	3
HHP:3550	Human Physiology With Laboratory	5
PHYS:1400	Basic Physics	3-4
PHYS:1511	College Physics I	4

Quantitative or Formal Reasoning

Course #	Title	Hours
One of these:		
MATH:1020	Elementary Functions	4
MATH:1440	Mathematics for the Biological Sciences	4

Psychology

Course #	Title	Hours
PSY:1001	Elementary Psychology	3

Medical Terminology

Course #	Title	Hours
CLSA:3750	Medical and Technical Terminology	2

Culture, Society, and the Arts

Two courses for 3 s.h. each in two of these areas.

- Understanding Cultural Perspectives
- Historical Perspectives
- International and Global Issues
- Literary, Visual, and Performing Arts
- Values and Society

See GE CLAS Core (College of Liberal Arts and Sciences) in the catalog for approved courses in the areas listed.

Once students are admitted to the Carver College of Medicine and the radiation sciences major, they must at least complete their final consecutive 30 s.h. at the University of Iowa, including the online modality courses and practicum (optional).

Second Modality

Students complete the following with a C or above.

Core Courses

Course #	Title	Hours
Both of these:		
RSCI:4110	Vascular Anatomy	3
RSCT:4100	Sectional Anatomy for Imaging Sciences	3

Modality Courses

Course #	Title	Hours
24 s.h. from these:		
RSBI:3310	Patient Care for Breast Imaging	3
RSBI:4110	Breast Imaging Procedures and Analysis	3
RSBI:4120	Anatomy and Pathology for Breast Imaging	2
RSBI:4130	Breast Imaging Acquisitions and Principles	2
RSBI:4210	Breast Imaging Advanced Procedures and Analysis	3
RSBI:4220	Quality Control in Breast Imaging	3
RSBI:4308	Breast Imaging Practicum	1-6
RSCI:4120	CVI Principles	4
RSCI:4130	Electrocardiogram and Hemodynamics	3
RSCI:4140	CVI Peripheral Procedures and Pathology	3
RSCI:4150	CVI Neurology and Nonvascular Procedures and Pathology	3
RSCI:4160	CVI Cardiac Procedures and Pathology	4
RSCI:4308	Cardiovascular Interventional Practicum	1-6
RSCT:4120	Computed Tomography Procedures I	4
RSCT:4125	Computed Tomography Procedures II	4
RSCT:4130	Computed Tomography Physical Principles and QC	4
RSCT:4308	Computed Tomography Practicum	1-6
RSMR:4110	Fundamentals for the MRI Technologist	3
RSMR:4120	MRI Procedures I	4
RSMR:4130	MRI Procedures II	4
RSMR:4140	MRI Acquisition and Principles I	3

RSMR:4150	MRI Acquisition and Principles II	3
RSMR:4308	Magnetic Resonance Imaging Practicum	1-6

A practicum is not required. Acceptance into a practicum is not guaranteed

Students may apply up to two of the following multidisciplinary courses toward the modality courses requirement.

Course #	Title	Hours
Up to two of these:		
ASP:1800	Aging Matters: Introduction to Gerontology	3
ASP:3150	Psychology of Aging	3
CPH:1400	Fundamentals of Public Health	3
CSED:4111	Building Leadership and Success at Work	3
CSED:4140	Foundations of Leadership for Community Agencies	3
CSED:4175	Motivational Interviewing	3
CSED:4194	Interpersonal Effectiveness	3
CSED:4197	Citizenship in a Multicultural Society	3
ECON:1200	Principles of Macroeconomics	4
GHS:3850	Promoting Health Globally	3
HHP:2130	Human Development Through the Life Span	3
MGMT:2100	Introduction to Management	3
MGMT:3500	Nonprofit Organizational Effectiveness I	3
PSQF:1075	Educational Psychology and Measurement	3
PSQF:2700	Introduction to Understanding Trauma and Resilience	3
RHET:2135	Decoding Disability: Rhetoric of Access and Accommodations	3
SOC:3510	Medical Sociology	3
SOC:4225	The Social Psychology of Leadership	3
STAT:1020	Elementary Statistics and Inference	3

Electives

Students choose elective coursework to complete the minimum 120 s.h. required and the final consecutive 30 s.h. necessary to qualify for graduation.

Career Advancement

The majority of radiation sciences graduates are employed upon graduation. Graduates generally find jobs in hospitals, clinics, imaging centers, and physicians' offices. With experience, and sometimes additional education, they may find related jobs in management, sales, education, or as application specialists. Some students choose to continue their education in a master's, physician assistant, or other related medical program.

Most radiation sciences professionals with full-time jobs work 40 hours a week and may have holiday, weekend, evening, night, and on-call hours.

Students who complete Iowa's professional radiation sciences programs are eligible to apply for national certification exams administered by the appropriate agency in order to practice.

Licensure laws for radiographers, sonographers, and radiation therapists vary from state to state. Iowa is a licensing state, requiring radiographers and radiation therapists to have a permit to practice. Passing the national exam is a criterion used to issue a permit to practice.

More information on radiation sciences careers and outcomes may be found on the Radiation Sciences Program website. The Pomerantz Career Center offers multiple resources to help students find jobs.

Academic Plans

Sample Plans of Study

Sample plans represent one way to complete a program of study. Actual course selection and sequence will vary and should be discussed with an academic advisor. For additional sample plans, see MyUI.

Radiation Sciences, BS

- Diagnostic Medical Sonography and Cardiac/Vascular Professional Program [p. 12]
- Diagnostic Medical Sonography and General/Vascular Professional Program [p. 12]
- Radiation Therapy Professional Program [p. 12]
- Radiologic Technology Professional Program [p. 12]
- Radiologic Technology and Breast Imaging Professional Program [p. 13]
- Radiologic Technology and Cardiovascular Interventional Professional Program [p. 13]
- Radiologic Technology and Computed Tomography Professional Program [p. 13]
- Radiologic Technology and Magnetic Resonance Imaging Professional Program [p. 13]

Diagnostic Medical Sonography and Cardiac/Vascular Professional Program

This sample plan is currently being reviewed and will be added at a later date.

Diagnostic Medical Sonography and General/Vascular Professional Program

This sample plan is currently being reviewed and will be added at a later date.

Radiation Therapy Professional Program

This sample plan is currently being reviewed and will be added at a later date.

Radiologic Technology Professional Program

This sample plan is currently being reviewed and will be added at a later date.

Radiologic Technology and Breast Imaging Professional Program

This sample plan is currently being reviewed and will be added at a later date.

Radiologic Technology and Cardiovascular Interventional Professional Program

This sample plan is currently being reviewed and will be added at a later date.

Radiologic Technology and Computed Tomography Professional Program

This sample plan is currently being reviewed and will be added at a later date.

Radiologic Technology and Magnetic Resonance Imaging Professional Program

This sample plan is currently being reviewed and will be added at a later date.