BACHELOR OF SCIENCE IN RADIOLOGIC SCIENCES

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Radiographers are essential members of the health care team. Their knowledge of radiation protection, physics and biology, as well as technical procedures, allows them to deliver the safest and highest quality patient care through the use of multiple imaging modalities. In the evolving world of medicine, high technology imaging has become multifaceted, both in modalities and operationally.

To prepare students for careers in radiography, Quinnipiac University’s Department of Diagnostic Imaging offers a BS in Radiologic Sciences. The program offers didactic, laboratory and clinical training in diverse aspects of radiography including patient care, radiation safety, image production and procedures for the student who is motivated to become a member of the imaging profession. Students complete the program in a three-year accelerated format.

The first year of the bachelor’s degree program consists of University Curriculum studies. The component of the program accredited by the Joint Review Committee on Education in Radiologic Technology begins in the second year of study. During the second and third years, the students concentrate on didactic radiography classes and laboratory sessions on campus and clinical education at multiple clinical education centers. The curriculum is structured so students can apply the knowledge and skills developed in the classroom and laboratory to the care of patients in the clinical setting. Beginning in the spring semester of the sophomore year and continuing throughout the program, didactic and clinical courses are taken simultaneously to provide the opportunity for immediate application and reinforcement.

At the end of the third year, students are eligible for graduation with a bachelor’s degree in Radiologic Sciences, and are board-eligible for the American Registry of Radiologic Technologists (ARRT) certification examination. Students would be eligible to apply for one of two advanced studies options here at Quinnipiac University. Options within the Diagnostic Imaging Department include the two-year MHS Radiologist Assistant (http://catalog.qu.edu/graduate-studies/health-sciences/radiologist-assistant-mhs) program and the one-year MHS Advanced Medical Imaging and Leadership program (http://catalog.qu.edu/graduate-studies/health-sciences/advanced-medical-imaging-and-leadership-program).

BS in Radiologic Sciences Curriculum

The designated Radiologic Sciences course curriculum is subject to modification as deemed necessary to maintain a high-quality educational experience. The Academic Standing and Progression Committee recommendations regarding student progression, discipline or dismissal will be considered on a case-by-case basis.

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
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<tbody>
<tr>
<td>Freshman</td>
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<tr>
<td>Fall Semester</td>
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<tr>
<td>BIO 101 &amp; 101L</td>
<td>General Biology I and General Biology I Lab ¹</td>
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<tr>
<td>EN 101</td>
<td>Introduction to Academic Reading and Writing ²</td>
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<td>FYS 101</td>
<td>First-Year Seminar</td>
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<td>Spring Semester</td>
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<tr>
<td>BIO 102</td>
<td>General Biology II and General Biology Lab II ¹</td>
<td>4</td>
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<tr>
<td>EN 102</td>
<td>Academic Writing and Research ²</td>
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<tr>
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<td>RS 100</td>
<td>Fundamentals of Diagnostic Imaging</td>
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<tr>
<td>Credits</td>
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<td>BIO 211 &amp; 211L</td>
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<td>UC Elective</td>
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<td>3</td>
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<td>RS 241 &amp; 241L</td>
<td>Radiographic Image Production and Evaluation and Radiographic Image Production and Evaluation Lab I</td>
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<td>3</td>
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<td>Spring Semester</td>
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<tr>
<td>BIO 212 &amp; 212L</td>
<td>Human Anatomy and Physiology II and Human Anatomy and Physiology II Lab</td>
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<td>RS 222 &amp; 222L</td>
<td>Radiographic Procedures II and Laboratory Practicum II</td>
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<tr>
<td>RS 242 &amp; 242L</td>
<td>Radiographic Image Production and Evaluation and Radiological Processing and Exposure Lab</td>
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<td>RS 250</td>
<td>Radiologic Clinical Education I</td>
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<td>RS 297 &amp; 297L</td>
<td>Methods of Patient Care and Methods of Patient Care Lab</td>
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<td>RS 201</td>
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<td>RS 260</td>
<td>Radiographic Physics and Instrumentation</td>
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¹ Students must meet the minimum ACT score of 23 or SAT score of 1120 (critical reading and math combined) to declare the major.
² Students must take EN 102 Academic Writing and Research ² before or concurrently with EN 101.
³ Students must take CHE 101 General Chemistry I or PHY 101 General Physics I to declare the major.
⁴ Students must take CHE 101 General Chemistry I or PHY 101 General Physics I to declare the major.

Bachelor of Science in Radiologic Sciences
Student Learning Outcomes

Upon completion of the BS in Radiologic Sciences program, students will demonstrate the following competencies:

**Goal:** The students will be clinically competent.

1. **Clinically Knowledgeable:** Apply skills and knowledge from foundational courses.
2. **Procedurally Knowledgeable:** Demonstrate growth in procedural knowledge from all Radiologic Sciences coursework.

**Goal:** The students will demonstrate effective communication skills.

1. **Effective Communication:** Execute interpersonal communication with patients.
2. **Oral Proficiency:** Demonstrate their ability to present clear and creative ideas related to a case study.

**Goal:** The students will demonstrate critical thinking.

1. **Creative Proficiency:** Apply skills and knowledge from foundational courses.
2. **Analytical Proficiency:** Apply skills and knowledge from foundational courses.
3. **Professional Research:** Create a culminating capstone project.

**Mission Statement**

The Quinnipiac University Radiologic Sciences program supports the mission statements of both Quinnipiac University and the School of Health Sciences and their commitment to excellence in education. The mission of the Radiologic Sciences program at Quinnipiac University is to develop students’ technical and interpersonal communication skills through a logical sequence of didactic, laboratory and clinical experiences. The program offers multiple clinical assignments to provide maximum exposure to diversified radiographic procedures and imaging protocols. In addition, the program prepares graduates to be competent in the art and science of radiography. Graduates of the Radiologic Sciences program will meet the needs of the community as competent and highly qualified professionals. The program will prepare students for career entry and the ability to pursue advanced study.

Candidates applying for admission to the Radiologic Sciences program are required to have at least three years of high school college preparatory mathematics and one year of biology. One year of anatomy and physiology and one year of general chemistry or physics is recommended. In addition, the scores of the SAT or the ACT are an important consideration. Related health care experience is highly desirable. Prospective candidates also must satisfy general Quinnipiac University Admission Requirements (http://catalog.qu.edu/general-information/admissions).

**Policies**

In addition to the general policies of Quinnipiac University, such as due process and academic honesty, the following apply to students enrolled in the Radiologic Sciences program.

**Progression in the Program**

The Radiologic Sciences Program has both GPA and final course grade requirements.

A cumulative GPA of 2.5 and a programmatic GPA of 3.0 must be maintained each semester. The expectation is that all RS courses be completed with a final course grade of B or better. Final course grades of D or F in an RS course are unacceptable. Programmatic GPA calculation...

1. **Critical Decision Making:** Demonstrate their ability to perform non-routine and routine procedures.
2. **Image Analysis:** Evaluate images for quality and diagnostic value.

**Goal:** The students will grow and develop as highly qualified professionals.

1. **Professional Ethics:** Understand and apply ethical decision making.
2. **Professional Behaviors:** Conduct themselves professionally.
3. **Professional Research:** Create a culminating capstone project.

**Goal:** The program will continuously monitor and strive to sustain its effectiveness.

1. **Completion Rate:** Students who start the program will complete the program.
2. **Employer Satisfaction:** Employers will be satisfied with the education of the graduates of the program.
3. **Graduate Satisfaction:** Graduates will be satisfied with the education received from the program.
4. **Employment Rate:** Graduates of the program will be employed within six months of completion of the program.
Outcomes and Statistics

2018 Student Outcomes
- ARRT Credentialing Examination first-time pass rate – 92% (23 out of 25)
- Job placement rate – 100% (12 out of 12)
- Program completion – 73% (24 out of 33)

Five-Year Statistics 2014–2018
- Five-year average ARRT Credentialing Examination First-Time Pass Rate – 98% (135 out of 138 students passed on first attempt)
- The five-year job placement rate from May 2014 to May 2018 is 93% (65 of 70 students actively seeking employment obtained jobs). Prior to May 2015, this was based on those seeking employment after earning a certificate and did not include those students continuing at the university to complete their bachelor’s degree as full-time students.
  - The ARRT defines “not actively seeking employment” as a graduate who fails to communicate with the program regarding employment status after multiple attempts, or a graduate who is unwilling to seek employment that requires relocation, or a graduate who is unwilling to accept employment due to salary or hours, or a graduate on active military duty or a graduate who is continuing his or her education.
  - Due to an update to the ARRT eligibility requirements effective January 2015, students must earn their degree to be board eligible. Upon graduation, students will have met the bachelor degree requirements and may actively seek employment. This statistic does not include those students pursuing graduate degrees as full-time students.

Additional program costs

As a clinical education program, the Radiologic Science major requires some expenses that go beyond standard university tuition and fees:

1. Clinical Education Travel (gas, parking, public transportation) – Students will have clinical rotation experiences that take them off campus. For these rotations, the student will typically be traveling two to three times per week. Clinic begins in the sophomore year and students are responsible for providing their own transportation. **Cost – variable**

2. Immunizations – Consistent with the School of Health Sciences policy, all students must have a full battery of immunizations and in some cases titer affirmation of immunity for common diseases including but not limited to: MMR, HepB, varicella, polio, TDAP, TB and influenza. These must be documented prior to the start of clinical experiences during the sophomore year and must be maintained through the undergraduate education. The students are made aware of the requirements during the freshman year to allow ample time to complete. **Cost – variable**

3. Background Check – All students must undergo a background check prior to the start of clinical observations in the sophomore year. **Cost – approximately $60**

4. Drug Screening – All students must undergo a drug screening prior to the start of the main component of the program in the sophomore year. **Cost – approximately $38**
5. **Liability Insurance** – All students have liability insurance coverage through the university, free of charge, while performing required clinical activity. Students may choose to purchase additional coverage at their own expense.

6. **My Record Tracker** – Consistent with School of Health Sciences Policy, students must sign up for and maintain an online account with MRT. This program tracks all student health and safety records, provides documentation to prospective clinical sites, and provides notification of impending expiration dates. **Cost – approximately $30 per year**

Please note – All fees are subject to change.

**RS 100. Fundamentals of Diagnostic Imaging.** 1 Credit.
This course provides the student with a basic knowledge of the fundamentals of diagnostic imaging practice. Topics include defining diagnostic imaging as it relates to all imaging modalities, historical development of the profession, introduction to current and emerging practice arenas, and application of professional terminology. Students complete a self-study in medical terminology.

**Offered:** Every year, Fall

**RS 101. Introduction to Diagnostic Imaging.** 3 Credits.
Designed to provide an orientation to radiologic sciences, this course includes history, ethics and basic principles of radiation protections, medical and medicolegal terminology, as well as preclinical observation.

**Prerequisites:** Take RS 100.
**Offered:** Every year, Spring

**RS 201. Human Anatomy Imaging I.** 1 Credit.
This course presents in-depth consideration of human anatomy within systems located in the chest, abdomen and upper extremity of the body. Students discuss the structure and function of each anatomic component within each region. Conventional anatomic illustrations are correlated with their radiographic counterpart. The radiographic appearance of specific structures as demonstrated on conventional radiographic images is correlated to images obtained using other advanced imaging modalities such as computed tomography, magnetic resonance and sonography.

**Prerequisites:** Take BIO 212 BIO 212L RS 222.
**Corequisites:** Take RS 232.
**Offered:** Every year, Fall

**RS 202. Human Anatomy Imaging II.** 1 Credit.
This course presents in-depth consideration of human anatomy within systems located in the head, neck, pelvis and lower extremity. For each region, students discuss the structure and function of each anatomic component. Conventional anatomic illustrations are correlated with their radiographic counterpart. The radiographic appearance of specific structures as demonstrated on conventional radiographic images is correlated to images obtained using other advanced imaging modalities such as computed tomography, magnetic resonance and sonography.

**Prerequisites:** Take RS 201.
**Offered:** Every year, Fall

**RS 212. Radiographic Procedures I.** 2 Credits.
This course introduces the student to the basic concepts, principles and applications of radiographic and radiologic procedures. Additional applications related to orthopaedic terminology, pathologies and procedures, trauma and patient-related modifications also are presented.

**Prerequisites:** Take RS 101 MA 275 and BIO 102.
**Corequisites:** Take RS 212L.
**Offered:** Every year, Fall

**RS 212L. Laboratory Practicum I.** 2 Credits.
This practicum develops preclinical competency in radiographic procedures studied in RS 212, as well as routine hospital procedures and radiographic tasks, basic radiographic analysis, patient management, communications and manipulation of imaging equipment.

**Corequisites:** Take RS 212.
**Offered:** Every year, Fall

**RS 215. Radiation Safety and Protection.** 3 Credits.
Students are introduced to the effects of ionizing radiation on biological systems at the molecular, cellular, organism, and community levels, with emphasis on medical implications and radiation protection.

**Prerequisites:** Take RS 260.
**Offered:** Every year, Spring

**RS 222. Radiographic Procedures II.** 3 Credits.
This course builds on the foundations developed in RS 212. This course provides continued integration and expansion on the concepts, principles and applications of radiographic and radiologic procedures.

**Prerequisites:** Take RS 212.
**Corequisites:** Take RS 222L.
**Offered:** Every year, Spring

**RS 222L. Laboratory Practicum II.** 2 Credits.
Designed to develop preclinical competency in radiographic procedures studied in RS 222, this practicum focuses on radiographic tasks, basic radiographic analysis, patient management, communications and manipulation of imaging equipment.

**Prerequisites:** Take RS 212.
**Offered:** Every year, Fall

**RS 232. Radiographic Procedures III.** 3 Credits.
This course provides continued integration and expansion on the concepts, principles and applications developed in RS 212 and RS 222.

**Prerequisites:** Take RS 222.
**Corequisites:** Take RS 232L.
**Offered:** Every year, Fall

**RS 232L. Laboratory Practicum III.** 2 Credits.
This practicum is designed to develop preclinical competency in routine hospital procedures and radiographic tasks, basic radiographic analysis, patient management, communications and manipulation of imaging equipment.

**Prerequisites:** Take RS 222.
**Offered:** Every year, Fall

**RS 241. Radiographic Image Production and Evaluation.** 3 Credits.
This course presents the basic principles, concepts and practical applications of radiographic image production and diagnostic quality. Topics include radiation production, description and proper selection of exposure factors, radiation protection, imaging media, imaging equipment and basic imaging formulas.

**Prerequisites:** Take RS 101 MA 275 and BIO 102.
**Corequisites:** Take RS 241L.
**Offered:** Every year, Fall

**RS 241L. Radiographic Image Production and Evaluation Lab I.** 1 Credit.
The laboratory, which accompanies RS 241, is designed to demonstrate and reinforce the concepts and principles presented in class. (2 lab hrs.)

**Corequisites:** Take RS 241.
**Offered:** Every year, Fall
RS 242. Radiographic Image Production and Evaluation II. 3 Credits. This course expands on the foundations developed in RS 241. Integration and application of these foundations includes the development of exposure charts, methods of image processing, and the causation and identification of image artifacts. The course also incorporates quality control concepts and testing, and introduces basic terminology and principles of quality control and digital imaging systems.

Prerequisites: Take RS 241.
Corequisites: Take RS 242L.
Offered: Every year, Spring

RS 242L. Radiological Processing and Exposure Lab. 1 Credit. This laboratory, which accompanies RS 242, is designed to demonstrate and reinforce the concepts and principles presented in class. (2 lab hrs.)

Corequisites: Take RS 242.
Offered: Every year, Spring

RS 250. Radiologic Clinical Education I. 2 Credits. Students are provided with their initial clinical experience under the supervision of certified clinical instructors and clinical staff. Focus is on developing clinical competency and proficiency related to radiologic procedures and concepts taught in RS 212 and RS 241.

Prerequisites: Take RS 212 RS 241.
Corequisites: Take RS 222 RS 242.
Offered: Every year, Spring

RS 253. Radiologic Clinical Education II. 4 Credits. This course, a continuation of RS 250, is a 12-week, 35 hour-per-week summer clinical experience under the supervision of certified clinical instructors and clinical staff. Clinical competency and proficiency related to the performance of radiographic procedures and concepts are continually developed and assessed.

Prerequisites: Take RS 250.
Offered: Every year, Summer

RS 254. Radiologic Clinical Education IV. 3 Credits. This course, a continuation of RS 253, is a clinical experience under the supervision of certified clinical instructors and clinical staff. Clinical competency and proficiency related to the performance of radiographic procedures and concepts are continually developed and assessed.

Prerequisites: Take RS 253.
Corequisites: Take RS 232.
Offered: Every year, Fall

RS 255. Radiologic Clinical Education. 3 Credits. This clinical experience is under the supervision of certified clinical instructors and clinical staff. Clinical competency and proficiency related to the performance of radiographic procedures and concepts are developed and assessed.

Prerequisites: Take RS 254.
Corequisites: Take RS 290.
Offered: Every year, Spring

RS 260. Radiographic Physics and Instrumentation. 3 Credits. This course presents an analysis of the production of X-rays and the interaction of radiation with matter, units of radiation measurements and radiation protection.

Prerequisites: Take RS 242.
Offered: Every year, Fall

RS 290. Advanced Radiographic Procedures IV. 3 Credits. This course provides continued integration and expansion on the concepts, principles and applications developed in RS 232. Students are introduced to the basic principles of CT, DEXA, MRI and mammography.

Prerequisites: Take RS 232.
Corequisites: Take RS 290L.
Offered: Every year, Spring

RS 290L. Laboratory Practicum. 1 Credit. This practicum is designed to develop preclinical competency in routine hospital procedures and radiographic tasks, basic radiographic analysis, patient management, communications and manipulation of imaging equipment.

Prerequisites: Take RS 232.
Corequisites: Take RS 290.
Offered: Every year, Spring

RS 297. Methods of Patient Care. 2 Credits. This course focuses on a study of skills in providing humanistic care for the well, acute or chronically ill individual, including preparing patients for invasive as well as non-invasive imaging studies; basic clinical skills in infection control, including aseptic technique, venipuncture, vital signs and O2 administration; effective communication with emphasis on problem-solving skills.

Prerequisites: Take RS 101.
Corequisites: Take RS 297L.
Offered: Every year, Spring

RS 297L. Methods of Patient Care Lab. 1 Credit. This lab develops preclinical competency for the procedures described and demonstrated in RS 297. (2 lab hrs.)

Corequisites: Take RS 297.
Offered: Every year, Spring

RS 299. Independent Study. 1-4 Credits. This course presents the student with an opportunity to expand his or her professional expertise in areas that enhance managerial or research capabilities.

Offered: As needed

RS 318. Pathology for Imaging Sciences. 3 Credits. This course provides an introduction to the basic study of disease, including etiology, pathophysiology and current diagnostic procedures. Normal structure and function are reviewed prior to the discussion of each anatomic system.

Prerequisites: Take RS 222 BIO 212.
Offered: Every year, Fall

RS 336. Pharmacology for the Radiographer. 2 Credits. The major classifications/categories, clinical applications and implications of pharmaceuticals used in diagnostic imaging and interventional procedures are presented.

Prerequisites: Take RS 297.
Offered: Every year, January Term

RS 352. Radiologic Clinical Education. 2 Credits. This clinical experience is under the supervision of certified clinical instructors and clinical staff. Clinical competency and proficiency related to the performance of radiographic procedures and concepts are developed and assessed.

Prerequisites: Take RS 255.
Offered: As needed
RS 399. Independent Study. 1-3 Credits.
This independent study is designed to provide the student with an opportunity to expand his or her professional expertise in areas that enhance teaching, managerial or research capabilities. The study may consist of either advanced clinical experience or literature research or both.
Offered: As needed, All

RS 414. Research: Analysis and Critique (DMS 414). 3 Credits.
This course explores the basic elements of health care research including different types of research models and research strategies. Students explore the differences between a variety of publication types, including editorials, case studies and peer-reviewed research articles. Students also learn techniques for database queries.
Prerequisites: Take RS 101.
Offered: Every year, Fall

RS 489. Independent Study. 1-6 Credits.
Offered: As needed, All

RS 491. Open Topic. 1 Credit.
The course presents a current topic in diagnostic imaging.
Offered: As needed

RS 493. Open Topic. 3 Credits.
The course presents a current topic in diagnostic imaging.
Offered: As needed

RS 499. Capstone (DMS 499). 3 Credits.
This capstone course is intended for radiologic sciences majors and diagnostic medical sonography majors in their final semester. Students are required to develop a research project as it relates to the field of diagnostic imaging. The project may relate to the student's chosen focus and must include either a formal thesis paper or poster presentation.
Prerequisites: Take RS 414.
Offered: Every year, Spring