

BACHELOR OF SCIENCE IN RADIOLOGIC SCIENCES

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Radiographers are essential members of the healthcare 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 program consists of University Curriculum studies and an introduction to the profession. The professional component of the program accredited by the Joint Review Committee on Education in Radiologic Technology (JRCERT) begins in the second year of study. During the second and third years, students participate in didactic radiography classes, laboratory sessions on campus and clinical education at a variety of our clinical affiliates. The curriculum is structured for immediate application of knowledge and skills developed in the classroom and laboratory to be applied to the care of patients in the clinical setting.

At the end of the third year, students are eligible for graduation with a bachelor's degree in Radiologic Sciences, and for the American Registry of Radiologic Technologists (ARRT) certification examination. Upon successful completion of the bachelor's degree and ARRT certification exam, students are eligible to apply to Quinnipiac's one-year MHS Advanced Medical Imaging and Leadership (<http://catalog.qu.edu/graduate-studies/health-sciences/advanced-medical-imaging-and-leadership-program/>) 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.

| Course | Title | Credits |
|----------------------|---|---------|
| First Year | | |
| Fall Semester | | |
| EN 101 | Introduction to Academic Reading and Writing ¹ | 3 |
| FYS 101 | First-Year Seminar | 3 |
| MA 275 | Biostatistics ¹ | 3 |

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|--|---|-----------|
| CHE 101 & 101L or PHY 101 and PHY 101L | Fundamentals of General, Organic and Biological Chemistry I ² or Elements of Physics and Elements of Physics Lab | 4 |
| RS 100 | Fundamentals of Diagnostic Imaging | 1 |
| UC Elective | | 3 |
| Credits | | 17 |
| Spring Semester | | |
| EN 102 | Academic Writing and Research | 3 |
| RS 101 | Introduction to Diagnostic Imaging | 3 |
| HSC 202 | Medical Terminology | 2 |
| BIO 103 | Concepts in Human Biology ³ | 3 |
| UC Elective | | 3 |
| UC Elective | | 3 |
| Credits | | 17 |
| Summer Semester | | |
| Online or on campus: | | |
| UC Elective | | 3 |
| UC Elective | | 3 |
| Credits | | 6 |
| Second Year | | |
| Fall Semester | | |
| BIO 211 & 211L | Human Anatomy and Physiology I and Human Anatomy and Physiology Lab I | 4 |
| RS 241 & 241L | Radiographic Image Production and Evaluation and Radiographic Image Production and Evaluation Lab I | 4 |
| RS 212 & 212L | Radiographic Procedures I and Laboratory Practicum I | 4 |
| UC Elective | | 3 |
| UC Elective | | 3 |
| Credits | | 18 |
| Spring Semester | | |
| BIO 212 & 212L | Human Anatomy and Physiology II and Human Anatomy and Physiology II Lab | 4 |
| RS 222 & 222L | Radiographic Procedures II and Laboratory Practicum II | 5 |
| RS 242 & 242L | Radiographic Image Production and Evaluation II and Radiological Processing and Exposure Lab | 4 |
| RS 250 | Radiologic Clinical Education I | 2 |
| RS 297 & 297L | Methods of Patient Care and Methods of Patient Care Lab | 3 |
| Credits | | 18 |
| Summer Semester | | |
| RS 253 | Radiologic Clinical Education II | 4 |
| UC Elective | | 3 |
| Credits | | 7 |
| Third Year | | |
| Fall Semester | | |
| RS 201 | Human Anatomy Imaging I | 1 |
| RS 260 | Radiographic Physics and Instrumentation | 3 |

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|------------------------|--|------------|
| RS 232 & 232L | Radiographic Procedures III and Laboratory Practicum III | 5 |
| RS 254 | Radiologic Clinical Education IV | 3 |
| RS 318 | Pathology for Imaging Sciences | 3 |
| RS 414 | Research: Analysis and Critique (DMS 414) | 3 |
| Credits | | 18 |
| J-term | | |
| UC Elective | | 3 |
| Credits | | 3 |
| Spring Semester | | |
| RS 202 | Human Anatomy Imaging II | 1 |
| RS 215 | Radiation Safety and Protection | 3 |
| RS 255 | Radiologic Clinical Education | 3 |
| RS 290 & 290L | Advanced Radiographic Procedures IV and Laboratory Practicum | 4 |
| RS 499 | Capstone (DMS 499) | 3 |
| UC Elective | | 3 |
| Credits | | 17 |
| Total Credits | | 121 |

1

Initial placement in the English and mathematics courses is determined by placement examination and an evaluation of high school units presented. The minimum mathematics requirement is MA 275 or its equivalent.

2

Associated lab is required for both Chemistry and Physics. CHE 110 or PHY 110 with lab are acceptable to fulfill the requirement. Credits will also apply to the UC Natural Science requirement.

3

This course is a prerequisite for the required BIO 211 and BIO 211L course in the next semester.

All radiologic sciences course requirements must be completed in the appropriate semester as indicated above.

Completion of the above curriculum will meet requirements for graduation.

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. **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 become employed within six months of completion of the program.

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 healthcare 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 2.50 and a programmatic GPA of 3.00 must be maintained each semester. Final course grades of D or F in an RS course

are unacceptable. Programmatic GPA calculation and final course grade requirements begin with RS 100 and include all RS coursework thereafter.

Any student who does not maintain GPA requirements or earns a grade of D or F in any RS course will be referred to the Diagnostic Imaging department's Academic Progression and Retention Committee (APRC) for review. Students who fail to meet the minimum cumulative university GPA requirement of 2.50 and/or the minimum programmatic GPA requirement of 3.00 will be subject to sanctions up to and including program dismissal. Students who earn a final course grade of D or F for any RS course will be subject to program dismissal.

Transportation

Multiple clinical education centers are used throughout the professional component of the program. Students are responsible for their own transportation to and from these sites.

Summer Study

All students are required to perform one clinical assignment during the summer semester, second year (RS 253). This clinical practicum is performed during summer sessions I and II and may be performed only at a clinical affiliation currently approved by the Joint Review Committee on Education in Radiologic Technology (JRCERT) for the program.

Technical Standards

The Radiologic Sciences program is a rigorous program that places specific demands on its students. As stated in the mission of the program, graduates of the program will meet the needs of the community as efficient and highly qualified professionals.

The technical qualifications set forth by the American Registry of Radiologic Technologists combined with the program's views provide a guide to the essential qualities necessary to pursue a career in radiologic sciences as well as meet the expectations of the programs accrediting body (Joint Review Committee on Education of Radiologic Technologists: JRCERT).

Students in the program will be required to verify their understanding and compliance with the technical standards, or their belief that with reasonable accommodations these standards can be met, through reading, signing and returning the form to the program director.

Transfer Admissions

Internal and external transfer candidates are evaluated on a space-available, competitive basis.

Additional Program Costs

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

1. **Clinical/Fieldwork 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. **Cost – variable (please check with your insurance carrier).**

3. **Background Check** – All students must undergo an initial background check prior to the start of clinical/fieldwork experience.
 - a. Initial background check cost is \$63 for all domestic addresses for the past 7 years or \$158 for students who have resided in New York State in the last 7 years due to NY state surcharge.
 - b. Some clinical fieldwork sites may require an additional yearly background recheck. **Cost – \$32 per annual recheck.**
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 \$42.25.**
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. **EXXAT and APPROVE** – Students enrolled in professional programs must enroll in EXXAT and APPROVE.
 - a. EXXAT is the clinical tracking and assessment program used by the School of Health Sciences. **Cost – one-time payment of \$150 per student for the current major (students are responsible for this cost).**
 - b. APPROVE is the program within EXXAT that tracks all student health and safety records, provides documentation to prospective clinical sites, and provides notification of impending expiration dates. **Cost – \$35 for first year; \$10 per year thereafter.**

Please note – All fees are subject to change.

The Radiologic Sciences program at Quinnipiac University is accredited by:

The Joint Review Committee on Education in Radiologic Technology (jrcert.org (<http://www.jrcert.org>))
20 N. Wacker Drive, Suite 2850
Chicago, IL 60606-3182

Phone: 312-704-5300

The program received an eight-year accreditation (the maximum available) in Spring 2020. The re-accreditation process will commence in 2027 with submission of the self-study report to the JRCERT.

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.

Prerequisites: None

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, medial 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 RS 222L RS 253**Corequisites:** Take RS 232 RS 232L RS 318 RS 201 RS 254**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 RS 232 RS 232L RS 260 RS 254 RS 318**Offered:** Every year, Spring**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 and MA 275 and CHE 101 CHE 101L or PHY 101 PHY 101L.**Corequisites:** Take RS 212L RS 241 RS 241L**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.

Prerequisites: Take RS 101 and MA 275 and CHE 101 CHE 101L or PHY 101 PHY 101L;**Corequisites:** Take RS 212 RS 241 RS 241L**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 201 RS 232 RS 232L RS 254 RS 260 RS 318**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 RS 212L RS 241 RS 241L.**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 RS 212L RS 241 RS 241L.**Corequisites:** Take RS 222**Offered:** Every year, Spring**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 RS 222L RS 242 RS 242L RS 253 RS 297

RS 297L BIO 212 BIO 212L.

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 RS 222L RS 242 RS 242L RS 253 RS 297

RS 297L BIO 212 BIO 212L.

Corequisites: Take RS 232 RS 260 RS 318 RS 201 RS 254.**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 CHE 101 CHE 101L or PHY 101

PHY 101L.

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.)

Prerequisites: Take RS 101 MA 275 CHE 101 CHE 101L or PHY 101

PHY 101L.

Corequisites: Take RS 212 RS 212L 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 RS 241L RS 212 RS 212L.**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.)
Prerequisites: Take RS 241, RS 241L RS 212 RS 212L.
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 RS 212L.
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 RS 242 RS 242L RS 222 RS 222L RS 297 RS 297L.
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 RS 242 RS 242L RS 222 RS 222L RS 297 RS 297L BIO 212 BIO 212L.
Corequisites: Take RS 232 RS 232L RS 260 RS 318 RS 201.
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 RS 232 RS 232L RS 260 RS 318 RS 201 RS 414.
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 RS 242L RS 222 RS 222L RS 297 RS 297L RS 250 RS 253.
Corequisites: Take RS 254 RS 232 RS 232L RS 318 RS 254 RS 201.
Offered: Every year, Fall
- RS 290. Advanced Radiographic Procedures IV. 3 Credits.**
This course is the final in the series of Radiographic Positioning courses that will provide continued integration and expansion on the concepts, principles and applications developed in the Radiologic Sciences program.? Students are introduced to advanced imaging modalities, healthcare informatics and future directions in imaging. Review of ARRT examination content, application, and state licensure requirements will be discussed.
Prerequisites: Take RS 232 RS 232L RS 318 RS 201 RS 414 RS 254.
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 RS 232L RS 318 RS 201 RS 414 RS 254.
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 RS 212 RS 212L RS 241 RS 241L.
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.)
Prerequisites: Take RS 101 RS 212 RS 212L RS 241 RS 241L.
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.
Prerequisites: None
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 211 BIO 211L RS 222L RS 222L RS 250 RS 297 RS 297L RS 253.
Corequisites: Take RS 232 RS 232L RS 260 RS 254 RS 201.
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 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 212 RS 212L RS 297 RS 297L RS 250 RS 253.
Corequisites: Take RS 254 RS 232 RS 232L RS 318 RS 201.
Offered: Every year, Fall

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 RS 297 RS 297L RS 318 RS 254 RS 201.

Offered: Every year, Spring