

Radiologic Sciences

A Bachelor of Science degree, major in Radiologic Sciences (RS), combines foundational sciences, math, and general education with applied imaging classroom, lab and clinical experience. Students complete two or more years of rigorous academic courses followed by a two-year full-time professional internship within a hospital-based program affiliated with NDSU. Three unique and specialized internships available to RS majors at NDSU are **radiography**, **diagnostic medical sonography** and **echocardiography**. The internship focuses on didactic and clinical education that prepares the graduate to work in their respective discipline of radiography, diagnostic medical sonography, or echocardiography.

A strong science and math aptitude is important for RS majors to possess since academic courses include chemistry, physics, anatomy and physiology, microbiology, trigonometry, psychology, computer science, and statistics, in addition to general education courses. Students pursuing any one of the three specializations will complete the same pre-radiologic sciences college courses. During the final year of academic courses on campus, qualified students will apply for the two-year internship. The application process begins annually in the fall. Admission into the internship is competitive. Specific admission criteria is established in collaboration with each affiliated hospital program and generally includes successful completion of pre-requisite college courses, grade point averages (a minimum of 2.50-3.00 is required and varies by hospital program), references, related experience, interview and ability to meet program-designated technical standards. Students must also comply with criminal background and student conduct requirements.

Radiography

Radiographers, also known as radiologic technologists, perform diagnostic imaging examinations, accurately position patients, ensure quality diagnostic images are obtained, and adhere to radiation protection regulations for themselves, their patients, and coworkers. They work closely with radiologists, the physicians who interpret medical images, to diagnose or rule out disease or injury.

RS students who apply and are accepted into the two-year radiography internship will complete their applied classroom and clinical education in one of ten hospital-based radiologic technology programs with which the Department of Allied Sciences affiliates. All affiliated hospital programs maintain programmatic accreditation through the Joint Review Committee on Education in Radiologic Technology (JRCERT). The internship classes and clinical education will focus on anatomy, patient positioning, examination techniques, equipment protocols, radiation safety and protection, and basic patient care. Specific letter grades for internship classes and clinical courses are assigned by the hospital program, maintained on their program's official transcript, and are not included in calculation of NDSU's grade point average. Official transcripts are available upon written request from the hospital program. An NDSU grade of 'Pass' is awarded for successful completion of each term of the internship. College courses and the radiography internship class, lab, and clinical education constitute the baccalaureate degree awarded by NDSU. Graduates are eligible to take the national certifying exam administered by the American Registry of Radiologic Technologists (ARRT). NDSU graduates have enjoyed excellent pass rates on the ARRT exam.

Sonography

Sonographers use special equipment and high frequency sounds waves (ultrasound) to create images of internal body structure and organs. They have a high level of patient interaction and play a vital role in providing the physician with diagnostic images to interpret and assess medical conditions or conduct surgical procedures. Two options for NDSU students interested in sonography are **echocardiography** and **diagnostic medical sonography**.

Echocardiography

Echocardiographers, also known as cardiac sonographers, evaluate the anatomy and hemodynamics (blood flow) of the heart, its chambers and valves, and related blood vessels. RS students who apply and are accepted into echocardiography will complete their applied education in the 21-month internship offered through Sanford Health, Fargo, ND. Internship classes, scanning labs, and clinical experience will focus on adult echocardiography with rotations in pediatric and stress echo. College courses and the echocardiography classes, lab, and clinical education constitute the baccalaureate degree awarded by NDSU.

Diagnostic Medical Sonographers

Diagnostic medical sonographers evaluate abdominal structures like the kidney, liver, and spleen, breast tissue, reproductive system, blood vessels, fetal development, and musculoskeletal structures like tendons and joints. RS students who apply and are accepted into diagnostic medical sonography will complete their applied education in the 21-month internship offered through Sanford Health, Fargo, ND. Internship classes, scanning labs, and clinical experience will focus on abdomen, OB/GYN, small parts, and vascular sonography. College courses and the DMS classes, lab, and clinical education constitute the baccalaureate degree awarded by NDSU.

Information about the professional specializations, curriculum, internship, and advising contacts are available from the Department of Allied Sciences (<https://www.ndsu.edu/alliedsciences>). It is highly recommended that students interested in an RS major meet with the RS advisor at least one year prior to anticipated internship application to discuss degree requirements, RS specialization, internship admission, and to create a plan of study for successful completion of degree requirements.

Major Requirements

Radiologic Sciences Major

Degree Type: B.S.

Required Degree Credits to Graduate: 132

General Education Requirements for Baccalaureate Degree

- A list of approved general education courses is available here (<http://bulletin.ndsu.edu/past-bulletin-archive/2017-18/academic-policies/undergraduate-policies/general-education/#genedcoursestext>).
- General education courses may be used to satisfy requirements for both general education and the major, minor, and program emphases, where applicable. Students should carefully review the major, minor, and program emphases requirements for minimum grade restrictions, should they apply.

Code	Title	Credits
Communication (C)		
ENGL 110	College Composition I	3
ENGL 120	College Composition II	3
COMM 110	Fundamentals of Public Speaking	3
Upper Division Writing [†]		
Quantitative Reasoning (R) [†]		
Science and Technology (S) [†]		
Humanities and Fine Arts (A) [†]		
Social and Behavioral Sciences (B) [†]		
Wellness (W) [†]		
Cultural Diversity (D) ^{**†}		
Global Perspectives (G) ^{**†}		
Total Credits		39

* May be satisfied by completing courses in another General Education category.

† May be satisfied with courses required in the major. Review major requirements to determine if a specific upper division writing course is required.

Major Requirements

Code	Title	Credits
Radiologic Science Major Requirements		
CHP 190	Critical Thinking and Academic Success	2
RS 200	Introduction to Radiologic Sciences	1
RS 496	Field Experience	60
Professional education (internship) within an accredited affiliated school of radiologic technology includes the capstone experience.		
Related Courses Required:		
BIOC 260 or BIOC 460	Elements of Biochemistry Foundations of Biochemistry and Molecular Biology I	4
BIOL 220 & 220L	Human Anatomy and Physiology I and Human Anatomy and Physiology I Laboratory (May satisfy a general education category S)	4
BIOL 221 & 221L	Human Anatomy and Physiology II and Human Anatomy and Physiology II Laboratory	4
CHEM 117 & 117L	Chemical Concepts and Applications and Chem Concepts and Applications Lab (May satisfy a general education category S)	4
CSCI 114 or CSCI 116	Microcomputer Packages (May satisfy a general education category S) Business Use of Computers	3
MATH 105	Trigonometry (or higher level)	3
Select one microbiology course and lab from the following:		3-5
MICR 202 & 202L	Introductory Microbiology and Introductory Microbiology Lab	

MICR 350 & 350L	General Microbiology and General Microbiology Lab	
CHP 125	Medical Terminology for Health Professionals	1
PHRM 170	Common Medicines & Diseases	2
PHYS 211 & 211L	College Physics I and College Physics I Laboratory	4
PHYS 212 & 212L	College Physics II and College Physics II Laboratory	4
PSYC 111	Introduction to Psychology (May satisfy a general education category B)	3
STAT 330	Introductory Statistics (May satisfy a general education category R)	3
Special Major Electives (department approved)		
Sociology: Select one of the following:		3
SOC 426	Sociology of Medicine	
SOC 440	Sociology of Aging	
SOC 441	Death and Dying	
Communication: Select one of the following:		3
COMM 308	Business and Professional Speaking	
COMM 315	Small Group Communication	
COMM 380	Health Communication I	
COMM 381	Patient-Provider Communication	
COMM 383	Organizational Communication I	
CHP 400	Interprofessional Health Care Practice	
Total Credits		111-113

Degree Requirements and Notes

- All required courses must be completed with a grade of 'C' or above. All students must maintain a semester GPA of 2.0 or above for each semester in the College. A student who fails to meet this standard for two successive or three non-successive semesters may be terminated from enrollment in the College.
- Completion of the prerequisites does not guarantee a student internship. Selection of interns is competitive. Please consult your Radiologic Sciences advisor for more information.