

The logo for California State University Northridge (CSUN) is displayed in a large, bold, red serif font. A vertical line is positioned to the right of the letters.

CALIFORNIA
STATE UNIVERSITY
NORTHRIDGE

BS Radiologic Science Information Packet

Thank you for your interest in the CSUN Bachelor of Science in Radiologic Sciences Program. The large number of requests that we receive prevents a personal response. We hope this brochure will provide you with enough information to answer your initial questions about the professional program.

**Note As of 2018: Due to CSUN's impaction status, we are not allowed to consider students who have already obtained a Bachelor's degree or higher. Please go to www.jrcert.org to find alternative accredited RS programs in California.*

WHY CSUN BSRS?

Out of all accredited BS Radiologic Sciences Programs in the United States, only 36 are entry-level Bachelor of Science in Radiologic Sciences (BSRS) Programs. Within the BSRS Programs, the California State University, Northridge (CSUN) Radiologic Sciences Program is unique in that it requires both academic and clinical competencies in all of the following advanced imaging areas: Magnetic Resonance Imaging (MRI), Computed Tomography (CT), Interventional Radiology (IR), Cardiac Interventional Radiology (CI), Mammography (M), and Education. The BSRS graduate has more opportunities for entry and advancement in the field.

TABLE OF CONTENTS

Introduction 3

BS Radiologic Sciences Program Mission Statement 3

BS Radiologic Sciences Program Goals 3

General Program Information 4

Application and Acceptance Process 5

Background Checks for Student Clinical Placement 5

Drug Screening Requirements 6

Radiology Department Tour 6

Volunteer Hours 6

Academic Eligibility 6

Prerequisite Coursework 7

Selection Criteria 8

Important Deadlines 8

Graduation Requirements 8

Information for Currently Licensed and Certified Radiologic Technologists 8

Course Descriptions of Professional Coursework 9

BS Radiologic Sciences Program Course Schedule 12

BSRS Technical Standards (physical requirements of the job) 14

Steps for Completion 15

WHAT IS RADIOLOGIC SCIENCES OR RADIOGRAPHY?

Radiologic sciences is a rapidly expanding health care profession whose practitioners (Radiographers/Radiologic Technologists) work in many areas of the medical community. A Radiographer, as a member of the allied health team, must be able to perform a variety of humanitarian and technically oriented services.

The Radiographer works directly with the patient and physician, performing sophisticated diagnostic x-ray procedures. The Radiographer must know the principles of x-ray and radiation safety, the operation of many types of equipment, the technique of obtaining specific radiographic exposures, image processing, and the professional handling and care of patients. Graduates of the CSUN BSRS Program receive a diverse educational background, as well as greater opportunities for advancement and mobility within the profession of radiologic sciences. In addition to proficiency in general radiography, BSRS program graduates are educated in a variety of specialized imaging procedures, including Computed Tomography (CT), Magnetic Resonance Imaging (MRI), Interventional and Cardiovascular Imaging. These images are then used by the physician to diagnose potential diseases.

RADIOLOGIC SCIENCES PROGRAM MISSION STATEMENT

The mission of the California State University, Northridge baccalaureate in radiologic sciences program is to provide the community with a competent, professional radiologic technologist who possesses additional advanced medical imaging skills in MRI, CT and Interventional Radiography that meet the needs of the medical imaging community through a highly integrated and advanced level academic and clinical curriculum.

RADIOLOGIC SCIENCES PROGRAM GOALS

Graduates of the Radiologic Sciences Program at California State University, Northridge will:

1. Demonstrate a mastery of basic radiographic medical-imaging skills and advanced medical imaging skills in MRI, CT, and Interventional Radiography.
2. Demonstrate effective communication skills that provide compassionate, culturally competent and age-appropriate patient care.
3. Demonstrate problem-solving/critical-thinking skills that provide ethical and safe patient care.
4. Demonstrate the value of professional development for patient care and medical imaging that meets the needs of the medical imaging community.
5. Maintain program effectiveness through continual assessment.

General BSRS Program Information

The BSRS degree is offered as one of several degrees in the Department of Health Sciences, under the College of Health and Human Development. The BSRS program is accredited by the Joint Review Committee on Education in Radiologic Technology (JRCERT) and the California Department of Public Health, Radiologic Health Branch (CDPH-RHB). A primary objective of the Department of Health Sciences is to develop the abilities of students who will be prepared specifically for careers in the health professions. In keeping with this goal, the radiologic sciences program provides students with a broad-based general education and the advanced skills necessary to become a medical radiographer and an advanced medical imager.

The BSRS program is an entry-level radiologic sciences bachelor's degree. Therefore, the student must meet both the graduation requirements for a bachelor of science (BS) degree in radiologic sciences and the clinical education requirements for medical imaging. This clinical education, or internship, is comprised of 2600+ hours of hands-on, practical experience during the two-and-a-half years of study. Clinical hours will be completed according to a structured schedule in the radiology departments of the affiliated major sites, which include Northridge Hospital Medical Center, Keck Hospital of USC, VA Greater Los Angeles Healthcare System, and UCLA Medical Center. Students may also rotate through the following minor affiliate radiology departments at the CSUN Student Health Center, Shriners Hospital for Children, Providence Holy Cross Medical Center, Providence Tarzana Medical Center, Providence St. Joseph's Medical Center, Keck USC Outpatient Centers, Olive View Medical Center, Cedars-Sinai Medical Center, Cedars-Sinai Marina Del Rey Hospital, Children's Hospital of Los Angeles, Adventist Health Simi Valley, and Valley Presbyterian Hospital. Satisfactory completion of both, the BSRS degree and the clinical requirements of the program, qualifies the student to take the state and national exams. The fundamental education which qualifies the student for the national certification examination can also be obtained from a 2-year accredited community college-based radiologic technology program. CSUN covers the basic material for diagnostic imaging in 12 months and the remaining 18 months is in advanced imaging.

The BSRS program offered at CSUN goes beyond the basic level of education found in the community college programs. The CSUN BSRS program provides its graduates with a more diverse educational background with greater opportunities for advancement and mobility within the profession. In addition to proficiency in general radiography, our graduates find themselves well acquainted with many new and specialized imaging procedures available in this rapidly advancing field. These include computed tomography (CT), magnetic resonance imaging (MRI), interventional radiography (IR), cardiovascular imaging (CV), mammography (M) and positron emission tomography-CT (PET/CT). All curriculum and lab requirements for the California State Fluoroscopy permit are included in the following BSRS courses: Physics 376, HSCI 182, HSCI 482 and HSCI 385.

The objective of the program is to combine the fundamentals and techniques of Radiologic Technology with a general college education. The curriculum is relevant to preparation for employment in the various sub-specialties of Radiologic Sciences, such as:

- General diagnostic radiography – including geriatrics and pediatrics
- Emergency and trauma radiography
- Special procedures and operating room
- Interventional radiography (IR)/Cardiac Interventional radiography (CI)
- Computed tomography (CT)
- Mammography (M)
- Magnetic Resonance Imaging (MR)
- Position Emission Tomography: Computed Tomography (PET-CT)

The curriculum of the BSRS Program also allows for a great deal of vertical mobility. Several options include:

- Radiologic Sciences Education
- Graduate School eligibility (Radiologic Sciences, Public Health, Health Administration, Environmental and Occupational Health, Education)
- Commercial Companies (Technical Specialist)
- Administration (Radiology Manager)
- Radiation Protection Specialist (state or local agencies)

Salaries for Radiologic Technologists compare with those in other professions requiring similar preparation. They vary according to geographic location, institutional policies and personal qualifications. Average national salaries are described in the *Radiologic Technologist Wage and Salary Survey 2016* found at <https://www.asrt.org/docs/default-source/research/radiologic-technologist-wage-and-salary-survey-2016.pdf?sfvrsn=2>

Application and Acceptance Process

Admission to CSUN and admission to the BS Radiologic Sciences Professional Program are separate procedures requiring two separate applications. Students must first apply and gain admission to CSUN before applying to the BSRS professional program.

Procedure for gaining admission to CSUN:

1. Write to the Office of Admissions for an application form: Admissions and Records, California State University, Northridge, 18111 Nordhoff Street, Northridge, CA 91330, or go online to www.csun.edu.
2. Submit the application for admission along with the processing fee directly to the Admissions and Records Office prior to November 1st for the following fall semester, and check the CSUN website for application deadline changes for the spring semester. Specify the major as Radiologic Sciences, Major Code #342185B. *Note: As of 2018, CSUN no longer accepts second Bachelor's students for the radiologic sciences major.*
3. Have the official transcripts of all previous college course work sent directly to the Admissions and Records Office at CSUN.
4. If you live outside the area, you must seek on-campus advisement before submitting your CSUN application, only students who have been advised will be granted a Tier 2 exception (out of area).

During your prerequisites semesters, we urge you to make an early appointment for counseling therefore you should meet with a BSRS academic advisor to determine your eligibility to apply to the program. The BSRS advisors are happy to assist you toward a satisfying educational experience, and you can make an appointment with a dedicated BSRS advisor directly through <https://hsci.setmore.com/>. Appointments are readily available during fall and spring semesters as well as some limited winter and summer appointments. Applicants must have a one-on-one advisement with a dedicated BSRS advisor before the end of fall semester before you submit the BSRS program application. **A current degree progress report (DPR) pulled within the last 30 days or unofficial transcripts are required at the time of your appointment.**

If you are completing prerequisites at your local community college, please meet with the CSUN BSRS advisor at least one year before your planned transfer to CSUN. The advisor will confirm that all the prerequisite courses and requirements have been fulfilled.

If the BSRS advisor determines that you are eligible to apply, the procedure is as follows:

1. Go to the BSRS homepage (<http://www.csun.edu/health-human-development/health-sciences/radiologic-sciences>) and print up a BSRS application or request a Radiologic Sciences Application Packet from the Department of Health Sciences. Complete all portions and return it to: Radiologic Sciences Program, Department of Health Sciences, California State University, Northridge, 18111 Nordhoff Street, Northridge, CA 91330-8285 **BEFORE** the second Friday in January of the application year.
2. For community college transfer students: Send a second copy of your official college transcripts directly to the Department of Health Sciences in order to complete your supplementary Radiologic Sciences application. For current CSUN students: Attach a recent copy of your degree progress report (DPR)

Background Checks for Student Clinical Placement

The use of background checks on individuals working in clinical settings is one of the mechanisms that agencies use to help protect its clients/patients. While obtaining background checks on employees is not new for clinical agencies, The Joint Commission (TJC) has recently added to its Human Resources Standards (HR.1.20) a section related to clinical background checks for all persons placed or employed in an accredited facility. Therefore, all CSUN clinical hospital affiliates are requiring background checks on all students placed at its facilities and have the right to reject a student based upon information collected from these background checks.

Upon acceptance into the professional BSRS program, all students will be required to obtain their own background check and supply his or her background checks to the clinical sites for review of their criminal background check prior to the 1st day in June. This is necessary to ensure that the background check is reviewed by each facility's human resources department for acceptance or rejection prior to professional BSRS program placement. Information regarding the background check services will be given at the mandatory professional BSRS meeting scheduled in May for students accepted into the professional program. The BSRS faculty will not be responsible for obtaining or monitoring the background checks on individuals. **Students not successfully cleared for placement at CSUN BSRS affiliate hospitals will not be eligible to complete the degree in Radiologic Sciences.**

Drug Screening

Upon acceptance into the professional BSRS program, all students will be required to obtain a 10-panel drug test as required by our hospital affiliates. Information regarding drug testing agencies approved by the clinical affiliates will also be provided at the mandatory professional BSRS meeting in May. BSRS students are also subject to randomized drug screening as deemed necessary by the clinical affiliates.

Vaccinations

Upon acceptance into the professional BSRS program, all students will be required to be compliant with the clinical affiliates' vaccination requests. Students must provide proof of their vaccination record (or titers) including, but not limited to MMR, Varicella, TB, T-Dap, Annual Flu, Covid-19 (+ booster) vaccinations.

ID and Social Security Numbers

The BSRS clinical affiliates require all students to have a valid state or federally issued identification card (e.g. driver's license, US passport) AND a social security number. If you need help obtaining either of these documents, speak with a RS advisor.

Radiology Department Tour

All interested students are welcome to take a tour of one of our affiliate departments. Prior to submitting the application for the professional program, **you must have had a tour** of the facilities at either Northridge Hospital Medical Center (NHMC) or VA Greater Los Angeles Healthcare System (VAGLAHCS).

Tours are conducted during the fall and spring semesters as well as the winter interim and summer sessions. To schedule an appointment for a tour at one of our facilities, please call or email either one of the two facilities indicated below. Ask for the Clinical Coordinator. Be sure to ask for directions when you call and dress in a professional manner for the tour. Tours last approximately 30-45 minutes.

| Facility | Clinical Coordinator | Phone number | Email |
|---|----------------------|--------------------------------|--|
| Northridge Hospital (NHMC) | Lisa Naugle | (818) 885-8500, extension 2628 | Lisa.Naugle@DignityHealth.org |
| VA Greater Los Angeles Healthcare System (VAGLAHCS) | Lisa Grate | (310) 268-3657 | Lisa.Grate@csun.edu or lisa.grate-carnicella@va.gov |

Volunteer Hours

All BSRS professional program applicants must have completed at least 40 hours of volunteer hours (100+ hours will give maximum points for interview criteria for motivation) in an acute medical center (or hospital) prior to the interview. These hours should include shadowing a technologist in the radiology department or emergency department. If you have questions, contact a BSRS advisor. Once you have completed your hours, you should have the volunteer office document the total amount of hours on institutional letterhead. Volunteer hours are due at the time of your interview.

Program Eligibility

To be eligible for consideration for acceptance into the professional Radiologic Sciences Program, an applicant must:

1. Provide evidence of satisfactory student status at CSUN (student ID#).
2. Have completed or be in the process of completing all required prerequisite courses by the end of the Spring semester of which the student is applying.
3. Have taken a tour of NHMC or VAGLAHCS prior to submitting an application.
4. Have done a one-on-one advisement with a dedicated BSRS advisor by the fall semester before the BSRS program application submission deadline
5. Submit BSRS application to the Department of Health Sciences by the second Friday in January. All forms in the application and supporting documentation must be completed, which include:
 - a. A completed BS Radiologic Sciences Program application.
 - b. All sealed official transcripts, or current CSUN students can submit a recent DPR.
 - c. Evidence of student status at CSUN (i.e. student I.D. number or university letter of acceptance)
 - d. Evidence of volunteer hours in a hospital, if completed (minimum of 40 hours).
6. Interview with the BSRS selection committee.
7. A 2-day, on-campus orientation in May (will be required if you are selected to enter the professional program).
8. Evidence of medical insurance coverage (will be require, if you are selected to enter the professional program).
9. BLS Provider CPR proof by American Heart Association (will be required if you are selected to enter the professional program).
10. Background check and 10-panel drug screening (will be required if you are selected to enter the professional program).
11. Identification Card and Social Security number (will be required, if you are selected to enter the professional program).
12. Vaccinations including, but not limited to, MMR, Varicella, season influenza, COVID-19, etc. (if selected for program).

Applications **will not be eligible** for processing, if the candidate has one of the following:

1. A grade point average (GPA) of lower than 2.50 for prerequisite courses or as an overall GPA.
2. A grade of C- or below in any required prerequisite course.
3. A grade of C- or below in any Health Science Core course (HSCI 390 & HSCI 488), if taken.
4. More than 3 courses of GE, Upper Division GE, and Upper Division Health Science Core course work to complete by the Fall you start the program.

NOTE: All prerequisite courses in process at the time of final review of the application will be computed in the GPA as a "C."

Prerequisite Coursework

Currently, the prerequisite courses or their approved equivalents (i.e., by articulation agreements with community colleges or other institutions) are:

| | | |
|-----------------|--|-----|
| BIO 101 & Lab* | General Biology and Lab** | (4) |
| BIO 211/212(L) | Human Anatomy | (3) |
| BIO 281 | Human Physiology | (3) |
| MATH 106* | Math for Non-Calculus based Physics (or Pre-Calculus equivalent)** | (5) |
| CHEM 100* | Principles of Chemistry | (3) |
| PHYS 100A | General Physics I | (4) |
| PHYS 100B & Lab | General Physics II & Lab** | (4) |
| SOC 150* | Introductory Sociology** | (3) |
| PSY 150* | Principles of Human Behavior** | (3) |

*Ask the BSRS advisor about acceptable alternatives. Comparable coursework successfully completed at other institutions will be evaluated on an individual basis.

** Double count towards general education (GE) requirements

Important Deadlines

| | |
|---------------------------------|---|
| Second Friday in January | Deadline for all application materials (<i>must have met with a BSRS advisor and completed the hospital tour prior to submission of the BSRS application</i>) |
| Feb/March/April | Interviews (<i>All volunteer hours must be completed before the interview</i>) |
| May | Selection meetings and notification of acceptance or rejection |

Selection Criteria

Factors considered in selection are: overall GPA, prerequisite GPA and Interview scores.

Information for Currently Licensed and Certified Radiologic Technologists

The BSRS degree also offers an in-depth study of radiography for currently licensed RTs wishing to advance into education, administration, advanced imaging, or other opportunities for radiographers in the private sector. The program includes in its academic coursework topics such as: advanced physics and electronics of radiographic equipment, special procedures, educational methodologies, pathology, and the newer imaging modalities of computed tomography, vascular and cardiac imaging and magnetic resonance imaging.

If you are currently an ARRT registered radiographer, you may qualify for unit credit toward your degree. Many California community college radiologic science programs are articulated with California State University, Northridge. If you are a graduate of one of these programs, you will get full credit for your associate degree and professional coursework. If you are a graduate of a non-articulated program and are certified by the American Registry of Radiologic Technologists (ARRT), you will not be required to repeat the entry-level coursework or clinical education you have completed.

Eligibility for clinical credit requires:

1. A program application filed with the Program Director.
2. Copies of ARRT certification and California CRT State license filed with the Program Director.
3. Official Transcripts from the Accrediting Commission for Community and Junior Colleges (WASC-ACCJC) accredited college. (Unit credit will be given only to CSUN Radiologic Sciences majors)

The evaluation of other applicable coursework for credit toward the degree will be done on an individual basis.

Advanced Imaging Credentials only: The radiologic sciences program has also developed certificate programs in advanced imaging for mammography, MRI, CT, and Interventional Radiography. These certificates will contain subsets of the Bachelor of Science degree for specific modalities. For those RT's who are interested in the mammography or interventional/cardiovascular radiography certificate programs please make an appointment with one of the BSRS program advisors. For those RT's interested in the online CT and MRI certificate program offered through CSUN's Tseng College please visit <http://tsengcollege.csun.edu/programs/radiologic-technologyprograms>

The CSUN BSRS program has articulated with the following community colleges for Bachelor of Science in Radiologic Sciences degree: Bakersfield College, Cabrillo College, Chaffey College, City College of San Francisco, Cypress College, El Camino College, Foothill College, L.A. City College, Merritt College, Moorpark College, Mt San Antonio College, Orange Coast College, San Diego Mesa College, San Joaquin Delta College, Santa Barbara City College, & Yuba College.

Financial Aid

The total number units to obtain a BSRS degree is 126. This includes 61 units once the student is admitted in the RS professional program. All students are advised to contact the financial aid office at CSUN at <https://www.csun.edu/financialaid> to continuously check their financial aid/loan/grant eligibility while attending RS program.

Course Descriptions of Professional Coursework

PHYS 376 – RADIOLOGIC PHYSICS (3) [ALSO EARNS UPPER DIVISION G.E CREDIT IN SEC B5]

Prerequisite: PHYS 100A/L, PHYS 100B/L or instructor consent.

Specialized course devoted to the nature and production of X-radiation. Topics include the interaction of radiation with matter, attenuation of X-rays and the principles behind radiographic equipment and components.

HSCI 181 – MEDICAL IMAGING I (3)

Prerequisite: Acceptance into the Radiologic Sciences Option or consent of instructor.

An introduction to the role of the Radiologic Technologist. A study of the function and manipulation of equipment and technical factors used in the production of x-rays and in imaging systems used within radiology. Includes a progressive series of radiographic exercises in preparation for clinical experience.

HSCI 182 – MEDICAL IMAGING II (3)

Prerequisites: HSCI 181, 280, 285, Physics 376 or ARRT Certification. *Corequisite:* HSCI 281.

A study of imaging modalities and equipment utilized in Radiology. Includes a progressive series of exercises involving radiation protection procedures, problem-solving techniques and quality assurance programs to be used during clinical education. Considers the manipulation and use of body section Radiography, phototiming, image intensification and stereoscopic equipment.

HSCI 280 – RADIOLOGIC SCIENCES: CLINICAL EDUCATION I (2)

Prerequisite: Acceptance into the Radiologic Sciences Program. *Corequisite:* HSCI 285.

Orientation and introduction to clinical education in medical Radiography. At an affiliated hospital, each student participates with direct supervision in selected darkroom, clerical and basic radiographic procedures. Includes lectures in hospital organization, departmental administration and medical ethics.

HSCI 281 – RADIOLOGIC SCIENCES: CLINICAL EDUCATION II (2)

Prerequisites: HSCI 181, 280, 285, Physics 376 or ARRT Certification. *Corequisite:* HSCI 182, 286, 385.

Clinical participation in the Radiology Department of an affiliated hospital. Includes patient positioning, manipulation of exposure factors, film analysis and methods of patient care.

HSCI 282 – RADIOLOGIC SCIENCES: CLINICAL EDUCATION III (3)

Prerequisites: HSCI 182, 281, 286, 385, or ARRT Certification.

Clinical participation in the Radiology Department of an affiliated hospital. Includes patient positioning, manipulation of exposure factors, film analysis and methods of patient care.

HSCI 283 – RADIOLOGIC SCIENCES: CLINICAL EDUCATION IV (3)

Prerequisites: HSCI 182, 281, 282, 286, 385, or ARRT Certification. *Corequisite:* HSCI 380, 384, 480, 482..

Clinical participation in the Radiology Department of an affiliated hospital. Includes patient positioning, manipulation of exposure factors and advanced film analysis.

HSCI 284 – RADIOLOGIC SCIENCES: CLINICAL EDUCATION V (3)

Prerequisites: HSCI 283, 380, 384, 480, 482, or ARRT Certification. *Corequisite:* HSCI 302, 485, 487.

Clinical participation in the Radiology Department of an affiliated hospital. Includes patient positioning, manipulation of exposure factors and advanced film analysis.

HSCI 285 – RADIOGRAPHIC ANATOMY AND POSITIONING I (4)

Prerequisite: Biology 211, 212; Acceptance into the Radiologic Sciences Program. Corequisite: HSCI 280.

Comprehensive modular approach to radiographic positioning of the appendicular skeleton, vertebral column, genito-urinary tract, chest and abdomen, with emphasis on the associated anatomy, physiology and medical terminology.

HSCI 286 – RADIOGRAPHIC ANATOMY AND POSITIONING II (4)

Prerequisites: HSCI 181, 280, 285, Physics 376 or ARRT Certification. Corequisite: HSCI 281.

Methodologies and elements of pediatric radiology in depth, including positioning of the skull, facial bones, paranasal sinuses, mastoids and intraoral and extraoral radiography. Continuation of advanced technical film analysis.

HSCI 302 – BASIC PATHOPHYSIOLOGY (3)

Prerequisites: HSCI 283, 380, 384, 480, 482, or ARRT Certification. Corequisite: HSCI 284.

Study of the pathogenesis and clinical picture of common disease processes that impact the self-care of individuals. Focuses on the impact of environmental, genetic and individual factors in creating or perpetuating disturbed physiology, as well as on physiological adaptive responses and the interdependence of body systems.

HSCI 380 – CROSS-SECTIONAL ANATOMY FOR RADIOGRAPHERS (2)

Prerequisites: HSCI 182, 281, 282, 286, 385 or ARRT Certification. Corequisite: HSCI 283.

Introduction to cross-sectional anatomy with the use of advanced imaging techniques, including Computerized Tomography, Magnetic Resonance Imaging and Ultrasonography. Includes comparisons of the various modalities in demonstrating certain anatomy.

HSCI 385 – QUALITY ASSURANCE AND EVALUATION OF RADIOLOGY IMAGING EQUIPMENT (2)

Prerequisites: HSCI 181, 280, 285, Physics 376 or ARRT Certification. Corequisite: HSCI 281.

Study of quality assurance concepts and application for radiology departments. Includes evaluation of imaging equipment in one of the affiliated medical centers.

HSCI 386 – RADIOLOGICAL SCIENCES CLINICAL EDUCATION VI (3)

Prerequisites: HSCI 284, 302, or ARRT Certification.

Clinical participation in the radiology department of an affiliated hospital. Includes patient positioning, manipulation of exposure factors and advanced film analysis. Advanced Imaging techniques in MR, CT, IR and Cardiac Cath are included.

HSCI 387 – RADIOLOGIC SCIENCES CLINICAL EDUCATION VII (3)

Prerequisites: HSCI 386, or ARRT Certification. Corequisite: HSCI 483A.

Clinical participation in the radiology department of an affiliated hospital. Includes patient positioning, manipulation of exposure factors and advanced film analysis. Advanced Imaging techniques in MR, CT, IR and Cardiac Cath are included.

HSCI 480 – COMPUTED TOMOGRAPHY (2)

Prerequisites: HSCI 182, 281, 282, 286, 385 or ARRT Certification. Corequisite: HSCI 283.

Principles of Computed Tomography provide the Radiologic Technology student with a broad understanding of the applied physics and imaging techniques used in clinical Computed Tomography Imaging. Overviews all five generations of CT imaging. Clinical applications and processes that highlight the course content are conducted at the affiliated medical centers.

HSCI 482 – ANGIOGRAPHY AND INTERVENTIONAL TECHNOLOGY (3)

Prerequisites: HSCI 182, 281, 282, 286, 385 or ARRT Certification. Corequisite: HSCI 283.

Radiographic examinations involving surgical procedures and specialized equipment.

HSCI 483A – MEDICAL IMAGING PATHOLOGY (2)

Prerequisites: HSCI 284, 302, or ARRT Certification. Corequisite: HSCI 387.

Understanding the basic principles of pathology is an essential part of the radiologic technologist's training. Knowing how disease processes work and recognizing the radiographic appearance of specific diseases can aid the technologist in selecting proper modalities and determining the need for repeat radiographs in different situations. This kind of knowledge enables the radiologic technologist to become a more competent professional and a contributing member of the diagnostic team.

HSCI 485 – PRINCIPLES OF MRI (3)

Prerequisites: HSCI 283, 380, 384, 480, 482, or ARRT Certification. Corequisite: HSCI 284.

Principles of Magnetic Resonance Imaging (MRI) provides the Radiologic Technology student with a basic understanding of the applied physics, imaging techniques and imaged anatomy/pathology used in clinical magnetic resonance imaging. Clinical applications and processes that highlight the course content are conducted at the affiliated medical centers.

HSCI 486A – SEMINAR: ADVANCES IN RADIOLOGIC IMAGING I (1)

Prerequisites: HSCI 181, 280, 285, Physics 376 or ARRT Certification.

Research of diagnostic, interventional or therapeutic processes being developed or used in radiologic imaging for the purpose of improving the health and/or well-being of the patient population. Students work under the guidance of the instructor to research an approved topic and to develop a scientific paper, display or project. Students participate in seminar discussions on current research, present their research findings and demonstrate professional communication and critical-thinking skills.

HSCI 486B – SEMINAR: ADVANCES IN RADIOLOGIC IMAGING II (1)

Prerequisites: HSCI 283, 380, 384, 480, 482, or ARRT Certification. Corequisite: HSCI 284

Research of diagnostic, interventional or therapeutic processes being developed or used in radiologic imaging for the purpose of improving the health and/or well-being of the patient population. Students work under the guidance of the instructor to research an approved topic and to develop a scientific paper, display or project. Students participate in seminar discussions on current research, present their research findings and demonstrate outstanding professional communication, teaching and critical-thinking skills.

HSCI 487 – PROFESSIONAL DEVELOPMENT FOR RADIOGRAPHERS (3) [ALSO EARNS UPPER DIVISION G.E. CREDIT IN SEC E]

Prerequisites: HSCI 283, 380, 384, 480, 482, or ARRT Certification. Corequisite: HSCI 284.

Seminar includes discussion and application of instructional interventions used in accredited radiography programs. Discussions center on current issues and changes in practice as they apply to continuing curriculum development, the national accreditation process and patient education. Additional discussions center around the professionalization of the radiographer with topics covering professional ethics, professional codes of conduct and management of professionals.

EOH 467 – RADIOLOGIC HEALTH (3)

Prerequisite: Completion of basic science core, including Physics 100B and 100BL.

Comprehensive coverage of ionizing radiation with emphasis on health effects, measurement and protection.

Additional Health Sciences Upper Division Core Requirements for all Health Science students:**HSCI 390 & LAB – BIostatISTICS AND LAB (4)**

Corequisite: HSCI 390L. Preparatory: MATH 102 or MATH 103 or MATH 105 or MATH 140.

Principles, theory and practice of statistical analysis in health as they apply to health planning, epidemiological research and experimental research. 3 hours lecture, 2 hours lab.

HSCI 488 – EPIDEMIOLOGY (3)

Preparatory: HSCI 390

Nature, transmission, prevention and control of disease from a public-health approach. Historical background, current problems and trends in disease control.

Additional Electives that can be taken during the graduating senior fall semester:**HSCI 382 – MAMMOGRAPHY (3) [OPTIONAL ELECTIVE]**

Prerequisite: CRT (R) certificate or senior status in an accredited RT Program.

A study of breast anatomy, physiology and pathology with an emphasis on the use of Mammography in the detection of breast cancer. The course includes equipment, imaging techniques and quality control techniques. Successful completion of this course qualifies the student to sit for the state Mammography exam.

HSCI 484A – POSITRON EMISSION TOMOGRAPHY: FUSION IMAGING (3) [OPTIONAL ELECTIVE]

Prerequisite: Completion of basic science core, including Physics 100B and 100BL.

The Fusion Positron Emission Tomography: Fusion Imaging (PET/CT) course instructs students in the use of radioactive material through proper utilization of specialized equipment and techniques. This course prepares students to perform dose calculations, prepare radiopharmaceuticals, and discuss related quality control and quality assurance procedures on instrumentation. Course include radiation safety and radiobiology with an emphasis in radiation protection, storage and disposal of radioactive materials and inventory and control of radiopharmaceuticals.

Course Sequencing Schedule

(Subject to change)

| FALL – 1 | | UNITS | SPRING – 1 | | UNITS |
|-----------------|------------------------------------|----------|---------------|------------------------|----------|
| **Math 106 | Math NonCal Phys | 5 | Phys 100A | General Physics I | 3 |
| **Bio 101 & L | General Biology | 4 | **Soc 150 | Introductory Sociology | 3 |
| **Psych 150 | Prin of Human Behavior | 3 | Bio 211 & 212 | Anatomy +Lab | 3 |
| *GE | General Education | 3 | *GE | General Education | 6 |
| | | 15 units | | | 16 units |
| FALL – 2 | | UNITS | SPRING – 2 | | UNITS |
| **Phys 100B & L | General Physics | 4 | *GE | General Education | 12 |
| **Chem 100 | Prin. of Chemistry | 3 | *GE | Upper Division GE | 3 |
| Bio 281 | Physiology | 3 | | | 15 units |
| *GE | General Education | 3 | | | |
| | | 13 units | | | |
| FALL – 3 | | UNITS | SPRING – 3 | | UNITS |
| HSCI 181 | Medical Imaging I | 3 | HSCI 182 | Medical Imaging II | 3 |
| HSCI 280 | Clinical Ed I | 2 | HSCI 281 | Clinical Ed II | 2 |
| HSCI 285 | RAP I | 4 | HSCI 286 | RAP II | 4 |
| Phys 376 | Rad Physics | 3 | GE | Upper Division HSCI | 4 |
| | | 12 units | HSCI 385 | QA in Radiology | 2 |
| | | | HSCI 486A | Advances in Rad Sci I | 1 |
| | | | | | 16 units |
| SUMMER – 3 | | UNITS | | | |
| HSCI 282 | Clinical Ed. III | 3 | | | |
| FALL – 4 | | UNITS | SPRING – 4 | | UNITS |
| EOH 487 | Radiologic Health | 3 | **HSCI 487 | Prof. Dev. Of R.T. | 3 |
| HSCI 380 | Cross-Section Anatomy | 2 | HSCI 284 | Clinical Ed V | 3 |
| HSCI 482 | Angiography | 3 | HSCI 485 | Principles of MRI | 3 |
| HSCI 283 | Clinical Ed IV | 3 | HSCI 302 | Pathophysiology | 3 |
| HSCI 480 | CT | 2 | HSCI 486B | Advances in Rad Sci II | 1 |
| GE | Upper Division HSCI | 3 | *GE | Upper Division GE | 3 |
| | | 16 units | | | 16 units |
| SUMMER – 4 | | UNITS | | | |
| HSCI 386 | Clinical Ed. VI | 3 units | | | |
| FALL – 5 | | UNITS | | | |
| HSCI 387 | Clinical Ed. VII | 3 | | | |
| HSCI 483A | Med Imaging Path | 2 | | | |
| | | 5 units | | | |
| | | (plus) | | | |
| HSCI 382 | Mammography <i>(optional)</i> | 3 | | | |
| HSCI 484A | PET: Fusion Imag <i>(optional)</i> | 3 | | | |
| | | 11 units | | | |

* General Education (GE) requirements are to be satisfied according to the CSUN catalog under which a student entered the university.

** Double counts towards General Education and RS option prerequisite.

BS Radiologic Sciences Program Course Integration Schedule

2 ½ Years (5 Semesters + 2 Summers)

| SEMESTER | MONDAY | TUESDAY | WEDNESDAY | THURSDAY | FRIDAY |
|---|----------------------|------------------------------------|-------------------------------|----------------------|----------------------|
| Junior Status – Major Clinical Affiliates | | | | | |
| 1st FALL <i>(Junior)</i> | CSUN | CLINICAL 8-4:30PM | CSUN | CLINICAL 8-4:30PM | CSUN |
| Winter Break 2 Weeks | CLINICAL 8-4:30PM | CLINICAL 8-4:30PM | CLINICAL 8-4:30PM | CLINICAL 8-4:30PM | CLINICAL 8-4:30PM |
| 1st SPRING <i>(Junior)</i> | CSUN | CLINICAL 8-4:30PM | CSUN | CLINICAL 8-4:30PM | CSUN |
| 1st Summer 11 Weeks | CLINICAL 8-4:30PM | CLINICAL 8-4:30PM | CLINICAL 8-4:30PM | CLINICAL 8-4:30PM | CLINICAL 8-4:30PM |
| Senior Status – Major and Minor Affiliates | | | | | |
| 2nd FALL <i>(Senior)</i> | CLINICAL 8-4:30PM | CSUN | CLINICAL 8-4:30PM | CSUN | CLINICAL 8-4:30PM |
| Winter Break 2 Weeks | CLINICAL 8-4:30PM | CLINICAL 8-4:30PM | CLINICAL 8-4:30PM | CLINICAL 8-4:30PM | CLINICAL 8-4:30PM |
| 2nd SPRING <i>(Senior)</i> | CLINICAL 8-4:30PM | CSUN | CLINICAL 8-4:30PM | CSUN | CLINICAL 8-4:30PM |
| Graduating Senior Status – Major and Minor Affiliates | | | | | |
| 2nd Summer 11 Weeks <i>(Graduating Sr.)</i> | CLINICAL 8-4:30PM | CLINICAL 8-4:30PM | CLINICAL 8-4:30PM | CLINICAL 8-4:30PM | CLINICAL 8-4:30PM |
| 3rd FALL <i>(Graduating Sr.)</i> | CLINICAL 8-4:30PM | CLINICAL 8-4:30PM | CLINICAL 8-4:30PM | CLINICAL 8-4:30PM | CLINICAL 8-4:30PM |
| | | Optional Elective (Mammography) | Optional Elective (PET/CT) | CSUN | |

CLINICAL HOURS: Students will complete 2600+ hours of clinical education in the following areas

| <u>CLINICAL ROTATIONS:</u> | <u>HOURS:</u> |
|-----------------------------------|----------------------|
| Angiography (IR) | 240 |
| CT | 240 |
| Cardiac Cath Lab | 160 |
| Elective | 160 |
| Emergency Room | 120 |
| Evenings | 120 |
| General Diagnostic | 880 |
| MRI | 240 |
| Pediatrics | 200 |
| Surgery (OR) | 240 |
| | 2600 |
| *Hours subject to change | |



CALIFORNIA
STATE UNIVERSITY
NORTHRIDGE

Radiologic Sciences Program

Technical Standards

The following standards are capabilities related to successful practice in the radiography profession. These are non-academic criteria and include physical capabilities required of radiography students and radiography professionals. Students must be able to meet these standards in order to successfully complete the program. Please read each item carefully to determine if you are able to meet each requirement.

Motor Function Ability – good manual dexterity, motor skills, and eye-hand coordination are necessary in order to:

- | Yes | No | |
|--------------------------|--------------------------|--|
| <input type="checkbox"/> | <input type="checkbox"/> | Stand up and walk unassisted for 8+ hours on a tiled or carpeted surface. |
| <input type="checkbox"/> | <input type="checkbox"/> | Lift up to 25 lbs. of medical equipment and carry a distance of 20+ feet several times per hour. |
| <input type="checkbox"/> | <input type="checkbox"/> | Wear a 10 pound leaded apron for duration of 3+ hours. |
| <input type="checkbox"/> | <input type="checkbox"/> | Provide strength to move and operate equipment and patient care carts and wheelchairs. |
| <input type="checkbox"/> | <input type="checkbox"/> | Provide strength to transfer and position patients without placing patient at risk. |
| <input type="checkbox"/> | <input type="checkbox"/> | Bend, stoop, or crouch to reach a lower object several times per hour. |
| <input type="checkbox"/> | <input type="checkbox"/> | Rotate your forearm to manipulate machine locks and control knobs. |
| <input type="checkbox"/> | <input type="checkbox"/> | Reach overhead in order to manipulate an x-ray tube. |
| <input type="checkbox"/> | <input type="checkbox"/> | Handle various sized objects (i.e. image receptors, sand bags, sponges, sliding boards, etc.). |
| <input type="checkbox"/> | <input type="checkbox"/> | Don surgical gloves, fill syringes, and handle sterile trays and equipment. |

Communication Ability – The ability to communicate both orally and in writing as it relates to:

- | Yes | No | |
|--------------------------|--------------------------|--|
| <input type="checkbox"/> | <input type="checkbox"/> | Obtaining and recording patient history. |
| <input type="checkbox"/> | <input type="checkbox"/> | Explaining or discussing procedures. |
| <input type="checkbox"/> | <input type="checkbox"/> | Discussing patient consent forms. |
| <input type="checkbox"/> | <input type="checkbox"/> | Providing clear verbal instructions to patients either face-to-face or from the radiography control area, which is a distance away from the patient. |

Visual Acuity – The ability to see fine lines and to distinguish gradual changes in blacks, grays, and whites necessary to evaluate:

- | Yes | No | |
|--------------------------|--------------------------|---|
| <input type="checkbox"/> | <input type="checkbox"/> | Radiographic images in dimmed lighting |
| <input type="checkbox"/> | <input type="checkbox"/> | Assess the direction of the central ray to the anatomical part being imaged |
| <input type="checkbox"/> | <input type="checkbox"/> | Read department protocols for imaging procedures, examination requests, monitors, and any written directions or orders. |

Hearing Ability – The ability to hear sounds is necessary in order to:

- | Yes | No | |
|--------------------------|--------------------------|--|
| <input type="checkbox"/> | <input type="checkbox"/> | Respond to patient questions, concerns and needs. |
| <input type="checkbox"/> | <input type="checkbox"/> | Respond to physician directions, questions, and needs. |

*MRI Safety – The ability to perform magnetic resonance imaging (MRI) requires not having any contraindications that would be adversely impacted by being around a strong (1.5-3 tesla) magnetic field. Do you have any of the following:

- | Yes | No | |
|--------------------------|--------------------------|---|
| <input type="checkbox"/> | <input type="checkbox"/> | Pacemakers, ICD, or pacing wires |
| <input type="checkbox"/> | <input type="checkbox"/> | Aneurysm clips prior to 2000 |
| <input type="checkbox"/> | <input type="checkbox"/> | Cochlear ear implants |
| <input type="checkbox"/> | <input type="checkbox"/> | Non-removable neurostimulators or bone growth stimulators |
| <input type="checkbox"/> | <input type="checkbox"/> | Other metal implants: _____ |

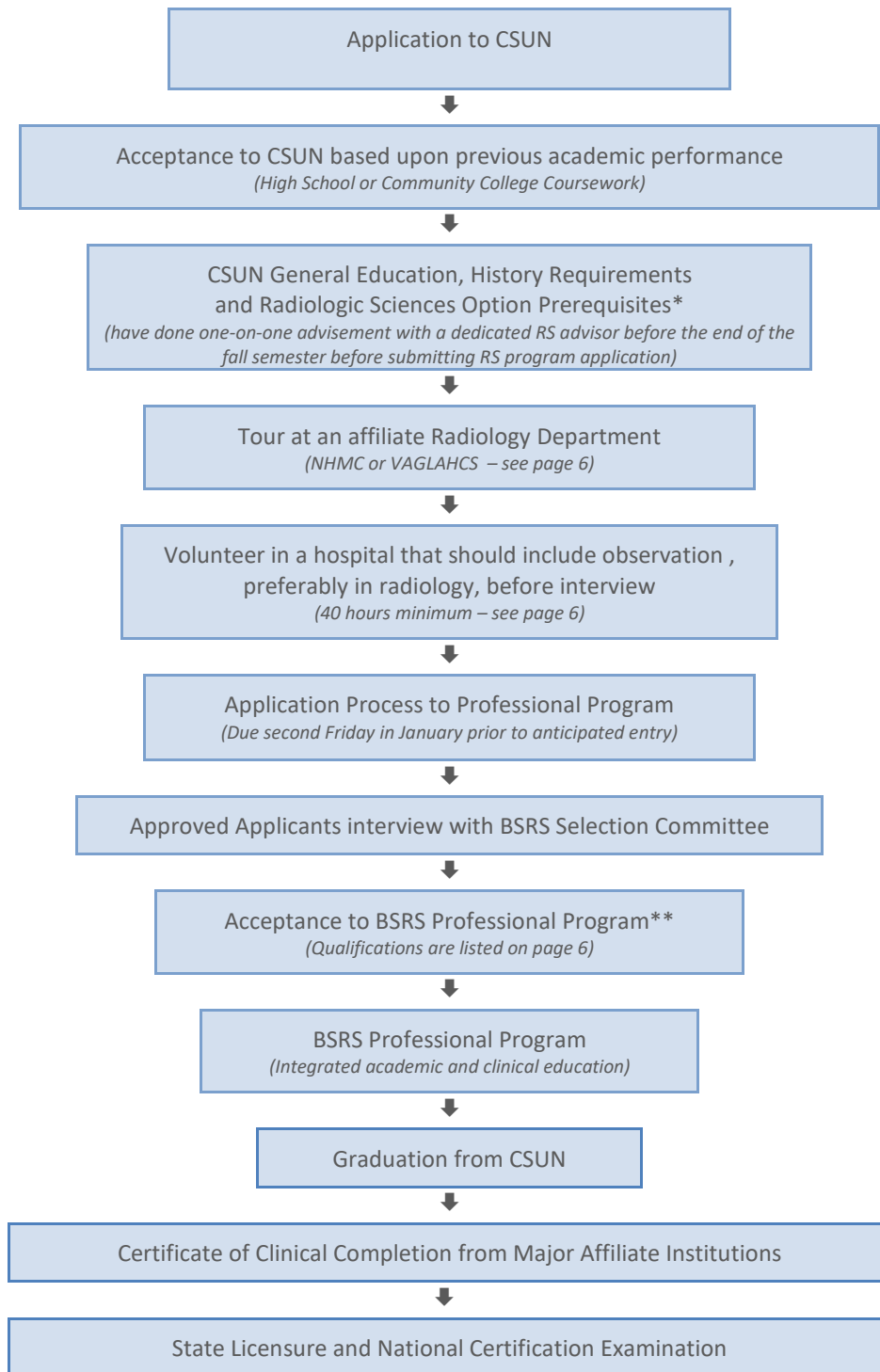
If you would like to request accommodations, please speak with a BSRS academic advisor and contact disabilities resource and educational services (DRES) at (818)677-4932 for assistance. Upon acceptance into the program and your functional abilities change, please meet with the RS program director for assistance.

Print Name

Signature

Date

Steps for Completion



*Advisement with Program Faculty Required.

**Professional Programs begin in the Fall Semester ONLY.