The 21-month Radiographic and Imaging Program is a continuous program designed to prepare a radiographer to perform all diagnostic procedures in an X-ray department, as well as other health settings.

The program is accredited by the Joint Review Committee on Education in Radiologic Technology, (312) 704-5300, and the California Department of Health, (916) 323-2786. JRCERT accreditation qualifies all graduates of the RT Program to take the Diagnostic Radiography ARRT Certification Examination (provided they have not been convicted of a felony).

Courses are arranged in a meaningful sequence and must be taken in the order planned. Progression toward and completion of the Associate Degree requires the attainment of a minimum grade of “C” in all program and adjunct courses. (See “Department Requirements” to follow.)

Campus classes provide theory and laboratory practice, which are correlated with clinical experience in the radiology departments of affiliated institutions. A prescribed, regulation uniform is worn during clinical assignments.

Students must provide their own transportation to all facilities and must be willing to travel 50 miles each way to the various clinical sites. Students are required to complete four clinical site rotations at any of the 16 affiliate sites they are assigned to. Clinical site locations extend from Santa Paula to San Luis Obispo. There is no guarantee that the clinic site will be in their city of residence. The student who misses 10% or more of the clinical portion of the program, each semester, is subject to dismissal pending faculty review.

All students are required to pass a physical exam before entering the program. If at any time before or after acceptance into the program, the student’s conduct or physical or emotional health is such that there is potential threat to the well-being of patients, the applicant will be denied admission to, or be withdrawn from, the major.

In addition to the policies and standards of Santa Barbara City College, Health Technologies programs have policies and requirements based on the professional standards and guidelines of their individual regulating state and national accrediting boards. These additional policies and requirements are listed in the student handbook and are reviewed in RT 101, Introduction to Radiography. All policies, including our pregnancy policy, are available upon request.

Returning students must fill out a petition to be approved before readmission into the program. Each petition will be reviewed on an individual basis and considered on space availability.

Limited-license radiographers may be eligible for transfer into the program with advanced standing. Contact the Department Chair (ext. 2504) or the Health Technologies Office (ext. 2366) for further information.

Certified radiographers who have completed a hospital-based training program may be eligible for up to 30 units of transfer credit toward an Associate in Arts Degree or for transfer to a California State University. Contact the Department Chair (ext. 2504) for more information.

Certified radiographers who wish to complete an Associate in Science Degree in Radiographic and Imaging Sciences at SBCC are required to complete the last two (2) semesters in the program.

Department Offices
Health Technologies Office (A-218, ext. 2366)
Application Secretary: Lorraine Michalak

Faculty & Offices
Debra McMahan, Chair (A-213, ext. 2504)
Bob Cook (A-240, ext. 2372)
Bruce Oda (A-245)

Advisers/Counselor Liaison
Counselor Liaison: Gwyer Schuyler (SS-128, ext. 2569)

Degrees Awarded
Associate in Science Degree in Radiography
Department Requirements (66.6 units)

AH 120 — Medical Technology .........................................1.0
RT 102 — Fundamentals of Radiographic Positioning & Procedures I ............................................4.0
RT 103 — Fundamentals of Radiographic Positioning & Procedures II ...........................................4.0
RT 109 — Principles of Radiographic Exposure ...............3.0
RT 111 — Advanced Principles of Exposure .................3.0
RT 119 — Radiologic Physics ...........................................3.0
RT 120 — Patient Care in Radiography ............................2.0
RT 191 — Radiographic Technology
  Clinical Practicum 1.......................................................4.7
RT 191A — Radiographic Technology
  Clinical Practicum 1A.....................................................2.1
RT 192 — Radiographic Technology: Clinical Pract. 2......4.7
RT 202 — Advanced Radiographic Procedures ................3.0
RT 203 — Radiology Certification Preparation .............4.0
RT 230 — Radiographic Pathology .................................3.0
RT 240 — Fluoroscopic Imaging & Radiation Protection ..3.0
RT 250 — Principles and Applications of
  Cross-Sectional Anatomy in Imaging......................2.0
RT 293 — Radiographic Technology:
  Clinical Practicum 3.......................................................5.9
RT 294 — Radiographic Technology:
  Clinical Practicum 4.......................................................7.1
RT 295 — Radiographic Technology:
  Clinical Practicum 5.......................................................7.1

Complete each course with a minimum grade of “C” or better.

Recommended Elective:
RT 251 — Principles of Mammography and Procedures ..2.0

College Requirements
For complete information, see “Graduation Requirements” in the Catalog Index.

Admission Requirements

2. High school graduation or equivalency. “Official” high school transcript (in a sealed envelope directly from the school) is required.

3. Eligibility for English 110 or 110H —Composition and Reading.

4. Eligibility for Math 107 or 111 —Intermediate Algebra.

5. Complete BMS 107, Human Anatomy (4 units), and BMS 108, Human Physiology (4 units), or equivalent, with a grade of “C” or better.

Before entering the program, applicant will be required to:
1. Complete RT 101;
2. Attend a Program Orientation Meeting;
3. Complete a physical examination, including immunizations (must be on the SBCC physical exam form which will be provided);
4. Obtain a CPR card—must be kept current throughout the program; and
5. Pay required badge and materials fees.

Failure to comply with any of the above requirements will make the student ineligible for admission to the program.

Refresher Students
Refresher students are those who are certified as radiographers in California and who want to participate in one or more SBCC Radiographic and Imaging courses. In most cases, this will be done because of a time lapse since being actively exposed to the practice of radiography. To participate in the program, call ext. 2366 for information.

Recommended Program

First Year

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Santa Barbara City College Catalog 2007-2008
**Second Year**

**Summer Session**
Radiography 293  
General Ed. course*

**Fall**  
Radiography 240  
Radiography 294  
Radiography 230  
Radiography 250  
Radiography 251  
General Ed. course*

**Spring**  
Radiography 202  
Radiography 203  
Radiography 295  
General Ed. course*  
General Ed. course*

*For a complete listing of General Education requirements, pick up a requirement sheet in the Counseling Center or see “Graduation Requirements” in this Catalog.

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**Course Descriptions**

**Radiographic & Imaging Sciences**

**RT 101 — Introduction to Radiography**  
(2.7) F, S — CSU

Introduction, overview and orientation for those interested in exploring radiographic imaging as a career. Completion of this course and the Prerequisites satisfy the requirements for entry into the Radiography Associate Degree Program.

**RT 102 — Fundamentals of Radiographic Positioning and Procedures I**  
(4) F — CSU  
Prerequisites: RT 101.

Precise and detailed information on routine radiographic procedures of the chest, abdomen, appendicular skeleton and vertebral column. Portable and traumatic exams also included.

**RT 103 — Fundamentals of Radiographic Positioning and Procedures II**  
(4) S — CSU  
Prerequisites: RT 102 with a “C or better.”

Basic principles of positioning for the skull, facial bones and various contrast procedures for the gastrointestinal and genito-urinal tract.

**RT 109 — Principles of Radiographic Exposure**  
(3) F — CSU  
Prerequisites: RT 101.

Provides first-year radiography students with the basic principles of radiation production and exposure techniques. Photographic and geometric factors which contribute to image quality and detail are discussed.

**RT 111 — Advanced Principles of Exposure**  
(3) S — CSU  
Prerequisites: RT 109.

Continuation of RT 109. Advanced analysis of the principles of techniques and their application in the clinical setting are studied. Students learn to calculate changes in technical factors and their effects on image production and quality.

**RT 119 — Radiologic Physics**  
(3) S — CSU  
Skills Advisories: Math 4 and Eligibility for ENG 110 or ENG 110H.

Limitation on Enrollment: Concurrent enrollment in the Radiographic Program or employment in the field.

Basic health physics with an emphasis on electricity and electromagnetic radiation. Special emphasis is on a study of the physics principles applicable to apparatus and procedures used in current practice of radiology.

**RT 120 — Patient Care in Radiography**  
(2) F — CSU  
Prerequisites: RT 101.

Provides the student with the concepts of patient care. Routine and emergency patient care procedures are described. Also included are topics on venipuncture and contrast media/medication administration. The role of the radiographer in patient care administration identified. Aspects of death and dying reviewed.

**RT 121 — Venipuncture in Radiography**  
(0.6) F, S — CSU

Provides the student with concepts of venipuncture and contrast media/medication administration. The role of the radiographer in administration of contrast media, legal aspects of contrast media injection, anatomy and physiology related to I.V. injections are covered.
RT 191 — Radiographic Technology Clinical Practicum 1
(4.7) F — CSU
Prerequisites: RT 101.
Introduction to clinical settings and exposure to departmental organization; patient flow; darkroom and processing procedures; observation of techniques employed; and policies and procedures of clinical cases. The student performs basic radiographic procedures under direct supervision.

RT 191A — Radiographic Technology Clinical Practicum 1A
(2.1) Winter — CSU
Designed to give each advanced student the opportunity to improve on clinical skills, as well as accumulate the clinical hours required by the California Department of Health.

RT 192 — Radiographic Technology Clinical Practicum 2
(4.7) S — CSU
Prerequisites: RT 191.
Second in a series of clinical education courses. Student is assigned 16 hours per week at a clinical education center. During this supervised experience, the student observes and performs diagnostic radiographic procedures. The student must demonstrate competency in recently taught radiographic exam, as well as in the exams previously evaluated.

RT 202 — Advanced Radiographic Procedures
(3) S — CSU
Prerequisites: RT 201
Provides the advanced student with a survey of advanced imaging and an introduction to other specializations in the radiation sciences. It concludes with an introduction to special invasive procedures, especially those dealing with the heart/vascular area.

RT 203 — Radiology Certification Preparation
(4)
Review of those subjects deemed critical for the ARRT examination. Consists of lectures, both by the instructor and guest, simulated registry examinations and a computer-assisted learning program.

RT 230 — Radiographic Pathology
(3) F — CSU
Introduction to more advanced pathological conditions for second-year students. Differentiates normal radiographic anatomy from pathologic conditions. Encompasses both the anatomy and physiology of each pathologic condition. Students expected to identify, evaluate and present common pathologic conditions throughout the course.

RT 240 — Fluoroscopic Imaging and Radiation Protection
(3) F — CSU
Introduction to the fluoroscopic imaging system and methods of reducing public and occupational dose. Biological effects of high-dose radiation, interactions of ionizing radiation, and state and federal regulations pertaining to protection discussed. Prepares students for National Certification and the California Fluoroscopy Permit Exam.

RT 250 — Principles and Applications of Cross-Sectional Anatomy in Imaging
(2) F — CSU
Provides an understanding of cross-sectional anatomy and knowledge of the relationships of human organs to each other as they appear in the sagittal, coronal and axial plane. The practical applications of cross-sectional with C.T., M.R.I. and ultrasound are emphasized.

RT 251 — Principles of Mammography and Procedures
(2) F — CSU
Prepares the radiographer for state and national certification in mammography. Content covers the anatomy and physiology of the breast, positioning, radiation biology and protection, and QA and QC regulations for mammography equipment.
RT 293 — Radiographic Technology Clinical Practicum 3
(5.9) Summer — CSU
Prerequisites: RT 192.
Third in a series of clinical education courses, which requires 40 hours per week for eight weeks in the clinical setting. This rotation allows the student opportunity to enhance basic skills, positioning techniques, patient care and understanding of clinical operations. The student must demonstrate continued competency in those exams previously mastered and additional competencies throughout the semester.

RT 294 — Radiographic Technology Clinical Practicum 4
(7.1) F — CSU
Prerequisites: RT 293.
Fourth in a series of clinical education courses to increase technical and clinical proficiency in routine and advanced X-ray procedures under supervision of the clinical coordinator/clinical instructor and departmental radiographers. The student must demonstrate competency of recently taught radiographic exams, plus continued competency of exams previously evaluated.

RT 295 — Radiographic Technology Clinical Practicum 5
(7.1) S — CSU
Prerequisites: RT 294.
Fifth in a series of clinical education courses to increase technical and clinical proficiency in routine and advanced X-ray procedures under supervision of the clinical coordinator/clinical instructor and departmental radiographers. The student must demonstrate competency of recently taught radiographic exams, plus continued competency of exams previously evaluated.

RT 298 — Diploma Radiography Credit
(30) — CSU
Skills Advisories: MATH 107 and Eligibility for ENG 110 or ENG 110H
Provides an opportunity for registered (ARRT/CRT) radiographers currently licensed in California who have graduated from diploma programs to receive 30 units of program credit toward an Associate Degree. Prior academic and clinical background is assessed by the Program Chairperson before credit is granted.

RT 299 — Independent Study in Radiography (1-4) — CSU
Course Advisories: RT 103.
Limitation on Enrollment: Completion of a minimum of 12 units at SBCC, with a 2.5 G.P.A., and a minimum of 6 units, with a 3.0 G.P.A. within the department. One to three hours of work/conference time per week to be coordinated with number of enrolled units.
Independent research in radiography under the guidance of a sponsoring faculty member. The project to be consistent with the ability and interest of the student and may be conducted in the laboratory and/or the field. Each unit of credit is equal to three hours of work.

NOTE: Continuation in the clinical area on a full-time basis will take place after graduation. This is done in order to complete the 24-month program requirement and will terminate upon the student’s anniversary date.

SONOGRAPHY
Diagnostic Medical Sonography (DMS), sometimes referred to as ultrasound, is a diagnostic medical procedure that uses high frequency sound waves (ultrasound) to produce dynamic visual images of organs, tissues, or blood flow inside the body. Sonography is increasingly being used in the detection and treatment of heart disease, heart attack, and vascular disease that can lead to stroke. It is also used to guide fine needle, tissue biopsy to assist in taking a sample of cells from an organ for lab testing (i.e. test for cancer in breast tissue). Unlike x-rays, sonography is a radiation-free imaging modality.

Department Offices
Health Technologies Office (A-218, ext. 2366)
Application Secretary: Lorraine Michalak (A-218, ext. 2366)
Debra vonBernuth, B.A., RDMS, RVT,
Nick Spina, B.A., R.T., RDMS

Advisers/Counselor Liaison
Counselor Liaison: Gwyer Schuyler (SS-128, ext. 2569)
Certificates Awarded
Certificate of Completion: Diagnostic Medical Sonography

Entrance Requirements
Before entering the DMS Program, students are required to:
1. Attend a DMS orientation meeting the semester prior to entry;
2. Complete the SBCC physical examination on SBCC form including immunizations;
3. Obtain a CPR card, which must be kept current throughout the program; and
4. File a college application in the Admissions Office, the semester prior to beginning classes at SBCC.

Application Procedure
Submit the following to SBCC Health Technologies Office:
• Completed DMS application
• A copy of professional license
• Official transcripts

Certificate Requirements for Diagnostic Medical Sonography:

Limitation on Enrollment: To enroll in DMS 150 and 155 students must have one of the following:
1. Completion of a two-year allied health education program that is patient-care related: Radiographic/Radiologic Technologist (R.T.), Respiratory Therapist (R.T.), Registered Nurse (R.N.), Occupational Therapist (O.T.), Physical Therapist (P.T.)
ORS
2. Bachelor’s Degree with the following prerequisites
   Anatomy (BMS 107 for 4 units at SBCC)
   Physiology (BMS 108 for 4 units at SBCC)
   Medical Terminology (AH 120 for 1 unit at SBCC)
   Patient Care in Radiography (RT 120 for 2 units at SBCC)

Please Note: RT 250 (Principles and Applications of Cross-Sectional Anatomy in Imaging) is a prerequisite to DMS 180 (Clinical Experience I).

Required Core Courses (53.8)
DMS 150 — Physics and Instrumentation.........................3.0
DMS 155 — Abdominal and Small Parts Scanning...........2.8
DMS 156 — OB/GYN Scanning........................................2.7
DMS 160 — Pathophysiology........................................3.0
DMS 165 — Abdom. & Small Parts Scan. & Pathol.............3.0
DMS 166 — OB/GYN Scanning and Pathology...................2.0
DMS 170 — Introduction to Vascular Ultrasound.............4.0
DMS 180 — Clinical Experience I...............................2.4
DMS 181 — Clinical Experience II...............................9.5
DMS 250 — Sonography Interpretation.........................3.0
DMS 280 — Clinical Experience III..............................8.9
DMS 281 — Clinical Experience IV..............................9.5

Length of Program
This is an 18-month Certificate Program in which courses are arranged in a meaningful sequence and must be taken in the order planned. The program begins each year with the start of the college’s Summer Session.

Summer Session
DMS 150: Physics & Instrumentation............................3
DMS 155: Abdominal & Small Parts Scanning...............2.8

Fall Semester
DMS 156: OB/GYN Scanning........................................2.7
DMS 160: Pathophysiology........................................3
DMS 165: Abd & Small Parts Scanning & Pathology..........3

Winter Intersession
DMS 180: Clinical Experience I...............................2.4
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<th>Course Descriptions</th>
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<tr>
<td><strong>Diagnostic Medical Sonography</strong></td>
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</table>
| **DMS 150 — Physics and Instrumentation**  
(3) Summer — CSU  
*Limitation on Enrollment: Must have certification as R.T., R.N.*  
Introduction to the basic acoustical physics and acoustical waves in human tissue. Emphasis is on ultrasound transmission in soft tissues, attenuation of sound energy, parameters affecting sound transmission and resolution of sound beams. |
| **DMS 155 — Abdominal and Small Parts Scanning**  
(2.8) Summer — CSU  
*Limitation on Enrollment: Must have certification as R.T., R.N.*  
Interpretation of normal anatomy, sonographic and gross anatomy, demonstrating scanning techniques and identifying normal sonographic protocols for abdomen and small parts. |
| **DMS 156 — OB/GYN Scanning**  
(2.7) F — CSU  
*Prerequisites: DMS 155*  
Interpretation of normal anatomy, sonographic and gross anatomy, demonstrating scanning techniques and identifying normal sonographic protocols for OB/GYN. |
| **DMS 160 — Pathophysiology**  
(3) F — CSU  
*Prerequisites: HIT 204*  
Specific study of pathology and pathophysiological mechanisms related to diagnostic medical sonography. |
| **DMS 165 — Abdominal and Small Parts Scanning and Pathology**  
(3) F — CSU  
*Prerequisites: DMS 155*  
Interpretation of normal and abnormal anatomy of abdomen and small parts, Sonographic and gross anatomy, comparing one disease to another. Identification of pathophysiological anatomic structures in various sonographic planes and images. |
| **DMS 166 — OB/GYN Scanning and Pathology**  
(2) S — CSU  
*Prerequisites: DMS 156*  
Interpretation of normal and abnormal OB/GYN anatomy, sonographic and gross anatomy, comparing one pathological condition to another. Identification of pathophysiological anatomic structures in various sonographic planes and images. |
| **DMS 170 — Introduction to Vascular Ultrasound**  
(4) F — CSU  
*Prerequisites: DMS 150.*  
Introduction to Doppler (color flow), with a hands-on approach. Overview of normal and pathological sonographic data: arterial and venous peripheral vascular, abdominal vasculature and extracranial carotid. |
| **DMS 180 — Clinical Experience I**  
(2.4) Winter — CSU  
*Prerequisites: RT 250*  
Introduction to clinical setting and exposure to departmental organization, policies and procedures, patient flow, darkroom and processing procedures, observation of clinical case techniques and protocols. |
DMS 181 — Clinical Experience II
(9.5) S — CSU
Prerequisites: DMS 180.
Continuation of clinical experience. Exposure to departmental organization, policies and procedures, patient flow, darkroom and processing procedures, observation of clinical case techniques and protocols. Beginning hands-on experience and equipment setup.

DMS 250 — Sonography Interpretation
(3) F — CSU
Prerequisites: DMS 181.
Interpretation and critique of normal anatomy with correlation of didactic, clinical presentations and critiques. Written and oral case presentations with emphasis on OB/GYN subjects.

DMS 280 — Clinical Experience III
(8.9) Summer — CSU
Prerequisites: DMS 181.
Clinical experience in ultrasound; equipment handling and patient management; departmental operation and scope.

DMS 281 — Clinical Experience IV
(9.5) F — CSU
Prerequisites: DMS 280.
Intermediate clinical experience; sonographic study of the abdomen, small parts and pelvis with real-time equipment; recognition of anatomical pathology.