

# Radiographic and Imaging Science

## Degrees, Certificates and Awards

AS Degree: Radiography

Certificate of Achievement:

Diagnostic Medical Sonography

## Program Description

The Radiographic and Imaging Program is a continuous 24-month program which begins each year in the Summer Semester. The program is designed to prepare a radiographer to perform all diagnostic procedures in a radiography 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 Public Health, (916) 323-2786. JRCERT accreditation qualifies all graduates of the RT Program to take the California Diagnostic Radiography Exam (CRT) and the American Registry of Radiologic Technology (ARRT) Diagnostic Radiography Certification Examination (provided they have not been convicted of a felony). Anyone convicted of a misdemeanor or felony must pre-apply to the ARRT before entering the program to assure that they will be able to take the national certification examination upon completion of the program.

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 100 miles each way to the various clinical sites. Students are required to complete four clinical site rotations at any of the 18 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. Any student that misses 10% or more of the clinical portion of the program, in a given 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is such that there is potential threat to the well-being of patients, the applicant will be denied admission to, or be withdrawn from, the major.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 100, Introduction to Radiography. All policies, including our pregnancy policy, are available upon request.

Returning students must fill out a petition (within the given time frame) to be approved before readmission into the program. Each petition will be reviewed on an individual basis and considered on space availability. Those students who do return will only be allowed to do so one time. 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.

## Mission Statement

The mission of the Associate in Science Degree program is to educate students to become competent radiographers who can serve the needs of a diverse patient population in an ethical and compassionate manner. Our basics goals are to

1. Graduate students that are clinically and technically prepared to enter the current job market.
2. Graduate students that are professional and ethical.
3. Graduate students that communicate effectively in the work care setting.
4. Graduate students that demonstrate clinical thinking and problem-solving skills in the performance of their duties.

## Program Student Learning Outcomes

1. *Radiation Protection:* Students are able to apply the principles of radiation protection as required by the state and federal agencies.
2. *Equipment Operation and Quality Control:* Students are able to safely operate and perform quality control measurements on radiographic equipment.

3. *Image Production and Evaluation*: Students are able to evaluate radiographic images for proper anatomy, positioning and technical factors.
4. *Radiographic Procedures*: Students are able to perform radiographic procedures on various anatomical regions based on physical and pathologic conditions.
5. *Patient Care and Education*: Students are able to apply the principles of oral, written and verbal communication to effectively deliver patient care.

**Department Offices**

Health Technologies Office (A-218, ext. 2366)

Lorraine Michalak, *Application Secretary*

**Faculty and Offices**

Bruce Oda, *Chair* (A-213, ext. 4374)

Danielle Terveen (A-213, ext. 3761)

**Department Requirements (73.6 units)**

AH 120* — Medical Technology .....	1
RT 101 — Introduction to Radiography .....	2.3
RT 102 — Fundamentals of Radiographic Positioning and Procedures I.....	4
RT 103 — Fundamentals of Radiographic Positioning and Procedures II.....	4
RT 109 — Principles of Radiographic Exposure .....	3
RT 111 — Advanced Principles of Exposure .....	3
RT 119 — Radiological Technology.....	3
RT 120 — Patient Care in Radiography.....	3
RT 191 — Radiographic Technology Clinical Practicum 1 .....	5.7
RT 191A — Radiographic Technology Clinical Practicum 1A .....	2.1
RT 192 — Radiographic Technology: Clinical Practicum 2 .....	5.1
RT 202 — Advanced Radiographic Procedures.....	3
RT 203 — Radiology Certification Preparation.....	4
RT 220 — Radiation Biology and Protection .....	3
RT 230 — Radiographic Pathology .....	3
RT 250 — Principles and Applications of Cross-Sectional Anatomy in Imaging.....	2
RT 293 — Radiographic Technology: Clinical Practicum 3 .....	6.7

RT 294 — Radiographic Technology: Clinical Practicum 4 .....	7.1
RT 295 — Radiographic Technology: Clinical Practicum 5 .....	8.6

*\*Note: HIT 135 has been approved by the Radiography Department as a possible substitute for AH 120.*

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

*Recommended Elective:*

RT 251 — Principles of Mammography and Procedures .....	2
RT 290 — Work Experience in Radiography.....	1-4

**College Requirements**

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

**Admission Requirements**

1. Obtain application in person from the Health Technologies Office (Admin. Bldg., Room 218).
2. Eligibility for ENG 110 or 110H — Composition and Reading.
3. Eligibility for MATH 104 or 107 or 111 — Intermediate Algebra.
4. 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 100;
2. Attend a program Orientation meeting;
3. Complete a physical examination, including immunizations and/or titers (must be on the SBCC physical exam form which will be provided);
4. Obtain a CPR card—must be kept current throughout the program;
5. Pay required badge and materials fees;
6. Pass a criminal background check and drug screening examination; and
7. Students will need a valid, government-issued Social Security card prior to testing for the ARRT and CRT board exams after the completion of the program.

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

*Summer Session*  
Radiography 101

<i>Fall</i>	<i>Spring</i>
Radiography 102	Radiography 103
Radiography 109	Radiography 111
Radiography 120	Radiography 119
Allied Health 120	Radiography 192
Radiography 191	General Ed. course*
General Ed. course*	

*Winter Intersession*  
Radiography 191A

### Second Year

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

<i>Fall</i>	<i>Spring</i>
Radiography 220	Radiography 202
Radiography 230	Radiography 203
Radiography 250	Radiography 295
Radiography 251	General Ed. course*
Radiography 294	
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.

## Radiographic and Imaging Sciences Courses

### RT 100 — Radiography and Health Care (2.0) — CSU

*Hours: 36 lecture*

Introduction, overview and orientation for those interested in exploring radiographic imaging or other health care careers. Completion of this course and the prerequisites satisfy departmental requirements for entry into the Radiography Associate Degree Program.

### RT 101 — Introduction to Radiography (2.3) — CSU

*Prerequisites: RT 100*

*Limitation on Enrollment: Passing criminal background check, pass a physical exam, valid CPR card.*

*Hours: 54 (36 lecture, 18 lab)*

Orientation to Radiography, providing students with entry-level information and skills to begin practice in an X-ray department. Topics include ethics, darkroom techniques, introduction to fluoroscopy, lab practice, basic radiation protection and patient care. Course concludes with a one-day orientation to an X-ray department.

### RT 102 — Fundamentals of Radiographic Positioning and Procedures I (4) — CSU

*Prerequisites: RT 101*

*Hours: 108 (54 lecture, 54 lab)*

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) — CSU

*Prerequisites: RT 102 with a "C" or better.*

*Hours: 108 (54 lecture, 54 lab)*

Basic principles of positioning for the axial skeleton to include vertebral column, skull, facial bones, contrast procedures for the gastrointestinal and genitourinary tract.

### RT 109 — Principles of Radiographic Exposure (3) — CSU

*Prerequisites: RT 101*

*Hours: 54 lecture*

Provides first-year radiography students with the basic principles of image production, exposure techniques, photographic and geometric factors, computed and digital radiographs, and radiation protection.

**RT 111 — Advanced Principles of Exposure  
(3) — CSU**

*Prerequisites:* RT 109

*Hours:* 54 lecture

Principles of X-ray production are examined, with the effect of image production with film and digital image systems. Principles of digital system quality control and maintenance are also discussed.

**RT 119 — Radiological Technology  
(3) — CSU**

*Skills Advisories:* MATH 4 and Eligibility for ENG 110 or 110H

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

*Hours:* 54 lecture

Designed specifically for radiation physics. The primary focus is on the fundamental concepts of energy and measurement, atomic structure, molecules, electricity, magnetism, electromagnetism, X-ray tubes, production, emission and interactions.

**RT 120 — Patient Care in Radiography  
(3) — CSU**

*Hours:* 54 lecture

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) — CSU**

*Hours:* 11 lecture

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 IV injections are covered.

**RT 191 — Radiographic Technology  
Clinical Practicum 1  
(5.7) — CSU**

*Prerequisites:* RT 101

*Hours:* 312 lab

Introduction to clinical settings and exposure to departmental organization; patient flow; CR and PACs; 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) — CSU**

*Hours:* 112 lab

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**

**(5.1) — CSU**

*Prerequisites:* RT 191

*Hours:* 272 lab

Second in a series of clinical education courses. Student is assigned 17 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) — CSU**

*Prerequisites:* RT 103

*Hours:* 54 lecture

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 system.

**RT 203 — Radiology Certification Preparation  
(4)**

*Hours:* 72 lecture

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 220 — Radiation Biology and Protection  
(3) — CSU**

*Hours:* 54 lecture

Fluoroscopic imaging systems, digital and conventional image intensification, radiation safety regulations, and quality control methods are discussed. Course is approved by the DPHS and prepares students for the California State Fluoroscopy Examination. Radiation biology, dose-effect relationships, and long-term somatic and genetic effects of radiation exposure are covered.

**RT 230 — Radiographic Pathology  
(3) — CSU**

*Hours: 54 lecture*

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) — CSU**

*Hours: 54 lecture*

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) — CSU**

*Hours: 36 lecture*

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 CT, MRI and ultrasound are emphasized.

**RT 251 — Principles of Mammography and Procedures  
(2) — CSU**

*Hours: 36 lecture*

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 290 — Work Experience in Radiography  
(1-4) — CSU**

*Limitation on Enrollment: Enrollment in a Radiology course, or current California Radiologic Technology license and at least one year's experience as a licensed Radiologic Technologist in a medical establishment within the preceding three years.  
Hours: 60-240 lab*

Consists of supervised on-the-job work experience for students whose radiology career objectives and course of study or employment complement each other. Students must accomplish specific course objectives. Class meetings are scheduled each semester.

**RT 293 — Radiographic Technology  
Clinical Practicum 3  
(6.7) — CSU**

*Prerequisites: RT 192*

*Hours: 360 lab*

Third in a series of clinical experiences requiring 40 hours per week for nine 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) — CSU**

*Prerequisites: RT 293*

*Hours: 384 lab*

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  
(8.6) — CSU**

*Prerequisites: RT 294*

*Hours: 464 lab*

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 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 GPA, and a minimum of 6 units, with a 3.0 GPA within the department.*

*One to three hours of work/conference time per week to be coordinated with number of enrolled units.*

*Hours: 54-216 lab*

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. You may be familiar with using ultrasound to image a fetus inside the womb. However, sonography is frequently used as a primary means to image structures such as the liver, gallbladder, kidneys, thyroid, reproductive organs, and vascular diseases that can lead to a stroke. It is also used to guide fine needle, tissue biopsy to assist in taking a sample of cells from an organ.) Unlike X-rays, sonography is a radiation-free imaging modality.

## Department Offices

Health Technologies Office (A-218, ext. 2366)

Lorraine Michalak, *Application Secretary*  
(A-218, ext. 2366)

Debra von Bernuth, B.A., RDMS, RVT

Nick Spina, B.A., R.T., RDMS

Danielle Terveen, B.S, RT, RDMS, RVT  
(A-213, ext. 3761)

## 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 and/or titers;
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.
5. Pass a criminal background check and drug screening examination.

## 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 (RT), Respiratory Therapist (RT), Registered Nurse (RN), Occupational Therapist (OT), Physical Therapist (PT) **or**
2. Bachelor's Degree with these prerequisites: Anatomy (BMS 107 for 4 units at SBCC) Physiology (BMS 108 for 4 units at SBCC) Medical Terminology (AH 120 for 1 unit or HIT 135 for 3 units at SBCC) Patient Care in Radiography (RT 120 for 3 units at SBCC) **or**

3. Medical Doctor (MD) or Doctor of Osteopathy (DO) degrees from outside of the U.S., equivalent to those of the U.S. and Canada

Note: RT 120 (Patient Care in Radiography) is a prerequisite to DMS 182 (Clinical Experience I).

**Required Core Courses (53.8 units)**

RT 250 — Principles and Applications of Cross-Sectional Anatomy in Imaging.....2  
 DMS 150 — Physics and Instrumentation.....3  
 DMS 155 — Abdominal and Small Parts Scanning.....3  
 DMS 156 — OB/GYN Scanning.....2.7  
 DMS 160 — Pathophysiology.....3  
 DMS 165 — Abdom. and Small Parts Scan. and Pathol...2.7  
 DMS 170 — Introduction to Vascular Ultrasound .....4  
 DMS 182 — Clinical Experience 1 .....9  
 DMS 183 — Clinical Experience 2 .....9.5  
 DMS 184 — Clinical Experience 3 .....2.4  
 DMS 185 — Clinical Experience 4 .....9.5  
 DMS 250 — Sonography Interpretation .....3

**Length of Program**

This is a 21-month Certificate program in which courses are arranged in a meaningful sequence and must be taken in the order planned. The program begins every other year with the start of the college's Fall Semester.

*Fall Session*

RT 250 — Principles and Applications of Cross-Sectional Anatomy in Imaging.....2  
 DMS 150 — Physics and Instrumentation.....3  
 DMS 155 — Abdominal and Small Parts Scanning.....2.8

*Spring Semester*

DMS 156 — OB/GYN Scanning.....2.7  
 DMS 160 — Pathophysiology.....3  
 DMS 165 — Abd and Small Parts Scanning and Pathology.....3

*Winter Intersession*

DMS 184 — Clinical Experience 3 .....2.4

*Fall Semester*

DMS 170 — Introduction to Vascular Ultrasound .....4  
 DMS 183 — Clinical Experience 2 .....9.5

*Summer Session*

DMS 182 — Clinical Experience 1 .....8.9

*Spring Semester*

DMS 250 — Sonography Interpretation .....3  
 DMS 185 — Clinical Experience 4 .....9.5

**Program Cost and Outcome**

For planning purposes, the following webpage provides information on the cost of attendance, program length (assuming a student attends full-time), financing options and historical student completion rates:

[www.sbcc.edu/financialaid/gainfulemployment/Diagnostic%20Medical%20Sonography.htm](http://www.sbcc.edu/financialaid/gainfulemployment/Diagnostic%20Medical%20Sonography.htm)

**Diagnostic Medical Sonography Courses**

**DMS 150 — Physics and Instrumentation (3) — CSU**

*Limitation on Enrollment: Completion of 24 month allied health education program that is patient-care related and included 6 months clinical experience: Radiographic/Radiologic Technician (R.T.), Respiratory Therapist (R.T.), Registered Nurse (R.N.), Occupational Therapist (O.T.), Physical Therapist (P.T.), etc.) OR Bachelor's degree with the following prerequisites: · Anatomy (i.e. BioMed 107) 4 units · Physiology (i.e. BioMed 108) 4 units · Medical Term. (i.e. Hlth Tech 120) 1 unit · Patient Care (i.e. R.T. 120) 2 units OR Medical Doctor (M.D.) or Doctor of Osteopathy (D.O.) degrees from in or outside the U.S., equivalent to those of the U.S. and Canada*  
*Hours: 54 lecture*

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 (3) — CSU**

*Limitation on Enrollment: Health and Safety regulation.  
Hours: 90 (36 lecture, 54 lab)*

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) — CSU**

*Prerequisites: DMS 155 with a minimum grade of "C"  
RT 120 with a minimum grade of "C" RT 250 with a minimum grade of "C"  
Hours: 72 (36 lecture, 36 lab)*

Interpretation of normal anatomy, sonographic and gross anatomy, demonstrating scanning techniques and identifying normal sonographic protocols for OB/GYN.

**DMS 160 — Pathophysiology (3) — CSU**

*Prerequisites: DMS 150 with a minimum grade of "C"  
DMS 155 with a minimum grade of "C"  
Hours: 54 lecture*

Specific study of pathology and pathophysiological mechanisms related to diagnostic medical sonography.

**DMS 165 — Abdominal and Small Parts Scanning and Pathology (2.7) — CSU**

*Prerequisites: DMS 155 with a minimum grade of "C"  
DMS 150 with a minimum grade of "C"  
Hours: 72 (36 lecture, 36 lab)*

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) — CSU**

*Prerequisites: DMS 156 with a minimum grade of "C"  
DMS 160 with a minimum grade of "C" DMS 165 with a minimum grade of "C" DMS 182 with a minimum grade of "P".  
Hours: 36 lecture*

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) — CSU**

*Prerequisites: DMS 150 with a minimum grade of "C"  
DMS 182 with a minimum grade of "P" DMS 165 with a minimum grade of "C" DMS 160 with a minimum grade of "C".*

*Hours: 108 (54 lecture, 54 lab)*

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 182 — Clinical Experience 1 (8.5) — CSU**

*Prerequisites: RT 120 with a minimum grade of "C"  
RT 250 with a minimum grade of "C" DMS 155 with a minimum grade of "C" DMS 150 with a minimum grade of "C" DMS 165 with a minimum grade of "C" DMS 156 with a minimum grade of "C" DMS 160 with a minimum grade of "C".*

*Limitation on Enrollment: Health and Safety regulations  
Hours: 460 lab*

Introduction to the clinical setting and exposure to departmental organization, policies and procedures, patient flow, darkroom and processing procedures, and observation of clinical case techniques and protocols.

**DMS 183 — Clinical Experience 2 (9.5) — CSU**

*Prerequisites: DMS 182  
Hours: 512 lab*

Continuation of clinical experience. Exposure to departmental organization, policies and procedures, patient flow, observation of clinical case techniques and protocols. Beginning hands-on experience and equipment set-up.

**DMS 184 — Clinical Experience 3 (2.4) — CSU**

*Prerequisites: DMS 183  
Hours: 128 lab*

Clinical experience in ultrasound: equipment handling, patient management, as well as departmental operations and scope.

**DMS 185 — Clinical Experience 4**

**(8.5) — CSU**

*Corequisites: DMS 184 with a minimum grade of "P"*

*Hours: 460 lab*

Advanced clinical experience, including sonographic study of the abdomen, small parts and pelvis, as well as OB/GYN exams to identify normal anatomy and pathologic conditions.

**DMS 250 — Sonography Interpretation**

**(3) — CSU**

*Prerequisite: DMS 184 with a minimum grade of "P"*

*Hours: 54 lecture*

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 290 — Work Experience in Sonography**

**(1-4) — CSU**

*Limitation on Enrollment: Enrollment in a Sonography course, or current Sonography license and at least one year's experience as a licensed Sonographer in a medical establishment within the preceding three years.*

*Hours: 60-300 lab*

Consists of supervised on-the-job work experience for students whose sonography career objectives and course of study or employment complement each other. Students must accomplish specific course objectives.