



Ultrasound (Diagnostic Medical Sonography)

Program Information

This program of study is designed to provide academic and clinical training in the field of general (OB/GYN and Abdominal/Superficial Structures) ultrasound (diagnostic medical sonography). The Associate of Applied Science degree awarded at program completion is a four-semester, competency-based curriculum that includes practical experience in regional health institutions. The ultrasound program at Trenholm State is currently accredited by the Commission on Accreditation of Allied Health Education Programs (CAAHEP). By attending a program accredited by CAAHEP, you will be able to apply to take the national certification examinations offered by the ARDMS/ARRT. By successfully completing the certification exams, you will be awarded the credential 'registered sonographer'.

Occupational Choices

Employment of diagnostic medical sonographers is projected to grow 23 percent from 2016 to 2026, much faster than the average for all occupations. Employment of cardiovascular technologists and technicians, including vascular technologists, is projected to grow 10 percent from 2016 to 2026, faster than the average for all occupations.

Sources: Bureau of Labor Statistics, U.S. Department of Labor, Occupational Outlook Handbook, 2016-2026, 2019 Survey

Average Full-Time Wage

The median annual wage for cardiovascular technologists and technicians was \$56,850 in May 2018. The median wage is the wage at which half the workers in an occupation earned more than that amount and half earned less. The lowest 10 percent earned less than \$29,340, and the highest 10 percent earned more than \$93,100.

The median annual wage for diagnostic medical sonographers was \$72,510 in May 2018. The lowest 10 percent earned less than \$51,430, and the highest 10 percent earned more than \$100,480.

Sources: Bureau of Labor Statistics, U.S. Department of Labor, Occupational Outlook Handbook, 2016-2026, 2019 Survey

Admission Criteria

ADMISSION REQUIREMENTS:

(Program applications and deadline for application submission will be posted to the Ultrasound (Diagnostic Medical Sonography) webpage in April each year).

Applicants must:

- Meet all general admission requirements of Trenholm State Community College and be in good standing.
- Complete all general required courses (prerequisites) courses with a minimum grade of "C" in each course (see program webpage).
- Minimum ACT score of 20.
- A minimum cumulative GPA of 2.5 or greater on a 4.0 scale with a grade of "C" or better on all general required prerequisite courses. Math/ Sciences courses must have been completed within seven (7) years of the date of expected entry into the DMS-program.
- Submit a completed DMS-program application by the application deadline to include all of the following documents:
 1. Completed DMS-Program Application. The program application can be found on the website in April. For application deadline please visit DMS webpage, Select Programs>Allied Health Division>Ultrasound.
 2. Copies of transcripts from ALL colleges previously attended
 3. A copy of your Trenholm State transcript showing completion and transfer of ALL prerequisite courses
 4. A copy of your ACT score showing 20 or higher. All applicants will be ranked according to his/her ACT score. Applicants with the highest ACT scores will be issued acceptance

Estimated Program Length & Cost *

Award	Length	Credit Hours	Tuition/Fees	Books	Tools	Supplies
Associate Degree (w/ prereqs)	6 Terms	76	\$12,084	\$1,250	0	\$350
(Not including prerequisites)	4 Terms	53	\$8,427	\$1,250	0	\$350

* Tax not included. Prices are subject to change without prior notice; cost of books may vary considerably among suppliers. Cost of general education books is in addition to the total listed above. The length of the program is based on full-time status of 12-15 credit hours per term. Enrollment in transitional level general education courses will alter the length of the program.

letters. Average ACT score for the past three years is 21.4.

- Candidates must be able to meet all Essential Functions required of the program with or without reasonable accommodation:

Student must be able to:

- access and accurately understand or analyze requisitions, orders, charts, directions, and other job-related documentation and communications;
- independently travel through the sonography department and to other departments and floors of the hospital;
- remain in a stationary position either sitting or standing for an extended time, equal to or greater than 30 minutes;
- assist patients to transfer from beds, wheelchairs, and stretchers to the sonography table and back;
- independently be able to perform CPR, first aid and general patient care;
- give clear commands to patients and communicate effectively with patients and professional staff; including with individuals wearing masks;
- independently access, adjust, and operate sonography equipment;
- independently assess the ongoing functioning of the sonography machine and other equipment;
- independently assess sonographic images, controls, labels, and observe patients; and
- work in a sterile environment, prepare sterile fields, and fill sterile syringes.

Admission to the Ultrasound (Diagnostic Medical Sonography) Program is competitive, and the number of students is limited by the number of faculty and clinical facilities available. Meeting minimal requirements does not guarantee acceptance.

Program Contact

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 Program Coordinator/Instructor
 334-420-4358
 Location: Trenholm Campus - Bldg. H

As part of ongoing planning and evaluation, the College regularly evaluates student learning outcomes for each program.

Awards Available

Associate of Applied Science
 Ultrasound
 (Diagnostic Medical Sonography)

Short Term Certificates
 Ultrasound
 (Diagnostic Medical Sonography)
 Vascular Sonography Concentration
 Cardiac Sonography/Echocardiography
 Concentration

**Associate of Applied Science
Ultrasound
(Diagnostic Medical Sonography)**

General Education Requirements (22 hours)

Area I - Written Composition (3 hours)
ENG-101 * English Composition I 3

Area II - Humanities & Fine Arts (3 hours)
 (Humanities and Arts disciplines include but are not limited to: Area/Ethnic Studies, Art and Art History, Foreign Languages, Music and Music History, Philosophy, Ethics, Religious Studies, Theater and Dance.)

Note: If SPH-106, SPH-107, SPA-101 or SPA-102 has been taken an additional 3 semester hours in Humanities and Fine Arts must be taken to satisfy requirements in Area II. Students may choose any humanities course from the list below.

Arts:

ART-100 Art Appreciation 3
 MUS-101 Music Appreciation 3

Humanities:

PHL-106 Intro to Philosophy 3
 PHL-206 Ethics & Society 3
 REL-100 History of World Religions 3
 REL-151 Survey of Old Testament 3
 REL-152 Survey of New Testament 3
 SPA-101 Intro Spanish I 3
 SPA-102 Intro Spanish II 3
 SPH-106 Fundamentals of Oral Comm 3
 SPH-107 Fundamentals of Public Speaking 3

Literature:

ENG-251 American Literature I 3
 ENG-252 American Literature II 3
 ENG-261 English Literature I 3
 ENG-262 English Literature II 3
 ENG-271 World Literature I 3
 ENG-272 World Literature II 3

Area III - Natural Science & Mathematics (12 hours)
 (In addition to Mathematics, disciplines in the Natural Sciences include: Astronomy, Biological Sciences, Chemistry, Geology, Physical Geography, Earth Science, Physics, and Physical Science.)

Note: 3 semester hours in MTH must be completed. Additional hours can be taken in the Natural Science area.

Mathematics:

MTH-100 * Intermediate Algebra 3

Natural Sciences:

BIO-120 * Medical Terminology 3
BIO-201 * Human Anatomy & Physiology I 4
PHY-120 * Introduction to Physics 4

Area IV - History, Social & Behavioral Sciences (3 hours):

(Social and Behavioral Sciences include, but are not limited to: Anthropology, Economics, Geography, Political Science, Psychology, and Sociology.)

Note: Must complete 3 semester hours.

Social and Behavioral Sciences:

PSY-200 * General Psychology 3

Area V: Pre-Professional/College Requirements:

(Courses appropriate to the degree requirements and major of the individual student and electives.)

College Requirements:

ORI-101 * Orientation to College		1
DMS-202	Foundations of Sonography	3
DMS-205	Abdominal Sonography w/ Lab	4
DMS-206	Gynecologic Sonography w/ Lab	4
DMS-207	Abdominal Pathology	3
DMS-215	Intro Sonographic Principles & Instr.	2
DMS-216	Sonographic Principles & Instr. I	3
DMS-217	Sonographic Principles & Instr. II	2
DMS-220	Obstetrical Sonography I	3
DMS-221	Obstetrical Sonography II	3
DMS-225	Superficial Sonography	1
DMS-229	Sonography Preceptorship I	2
DMS-230	Sonography Preceptorship II	3
DMS-231	Sonography Preceptorship III	4
DMS-232	Sonography Preceptorship IV	5
DMS-233	Sonography Lab I	1
DMS-234	Sonography Lab II	1
DMS-235	Sonography Lab III	1
DMS-240	Sonographic Prin & Inst Seminar	2
DMS-241	Sonography Seminar	3
DMS-245	Sonography Case Presentation	1
DMS-250	Intro to Advanced Sonography	3

Note: Although a CIS course is not required, all DMS-students will be required to demonstrate computer literacy through online assignment, presentations and other computer-based activities. Students must also complete computer literacy competency assignment.

Required General Education * (22 credit hours)

* Please Note: Courses with an asterisk and bolded must be completed prior to applying to the Diagnostic Medical Sonography program. All courses are offered at Trenholm State Community College. Transferability of courses from other education institutions will be assessed upon submission of a complete College application.

Area V Credit Hours: 54 Total Credit Hours: 76

Course Descriptions Ultrasound (Diagnostic Medical Sonography)

Course #	Course Title	Credit Hours
DMS-202	FOUNDATIONS OF SONOGRAPHY COREQUISITE: DMS-206, DMS-215, DMS-229, DMS-233 PREREQUISITE: Admission to program This course provides the student with concepts of the history and development of sonography in medical imaging, patient care, medical ethics and law, cultural diversity, and medical terminology used in the practice of sonography. Emphasis in theory and lab is placed on patient assessment and considerations of physical and psychological conditions in both routine and emergency situations. Upon completion, students will demonstrate an understanding of concepts, as well as demonstrate/explain patient care procedures appropriate to setting and situation while utilizing medical terminology. This is a CORE course.	3
DMS-205	ABDOMINAL SONOGRAPHY I with LAB COREQUISITE: DMS-207, DMS-216, DMS-220, DMS-230 PREREQUISITE: DMS-229 This course will provide instruction in a classroom and laboratory setting in order to perform sonographic studies of the abdomen. Classroom components will focus on concepts of normal and relational anatomy, physiology, Doppler principles, sonographic technique and appearance. At course completion the student will be expected to perform a complete abdominal sonogram. This is a CORE course	4
DMS-206	GYNECOLOGIC SONOGRAPHY with LAB COREQUISITE: DMS-202, DMS-215, DMS-229, DMS-233 PREREQUISITE: Admission to program This course will familiarize the student with the transabdominal and transvaginal protocols of gynecologic scanning and common pathologies of the female reproductive system as seen on ultrasound. Lab values and patient history will be stressed as well as correlation with images from other modalities. The student will be able to perform a transabdominal pelvic sonogram at course completion. This is a CORE course.	4
DMS-207	ABDOMINAL PATHOLOGY COREQUISITE: DMS-205, DMS-216, DMS-220, DMS-230 PREREQUISITE: DMS-229 This course will provide the student with a working knowledge of the sonographic appearance and pathophysiology of common diseases abnormalities of the abdomen. Associated history, symptoms, lab values, treatments and appearance on other imaging modalities will be demonstrated. The student will be required to conduct research for presentation. At course completion, students will be able to identify many major pathologies of the abdomen on sonograms. This is a CORE course.	3
DMS-215	INTRO TO SONOGRAPHIC PRIN/INSTR. COREQUISITE: DMS-202, DMS-206, DMS-229, DMS-233 PREREQUISITE: Admission to program This course will provide an introduction to mathematical and sonographic principles related to the application of sonography. This will also provide the student with knowledge of the principles of sound and imaging instrumentation as applied to sonography. The physical nature of sound waves and how those waves interact with mediums and how they can be successfully utilized in diagnostic imaging will be studied.	2
DMS-216	SONOGRAPHIC PRINCIPLES/INSTR. I COREQUISITE: DMS-205, DMS-207, DMS-220, DMS-230 PREREQUISITE: DMS-215 This course will provide the student with knowledge of the principles of sound and imaging instrumentation as applied to sonography. The physical nature of sound waves and how those waves interact with mediums and how they can be successfully utilized in diagnostic imaging will be studied. Upon completion the student will be able to produce sonographic images. This is a CORE course.	3
DMS-217	SONOGRAPHIC PRINCIPLES AND INSTR. II COREQUISITE: DMS-221, DMS-225, DMS-231, DMS-234, DMS-240, DMS-245 PREREQUISITE: DMS-216 This lab allows students to perform quality assurance tests and surveys. Students will also investigate statistical applications utilized in medical research. Upon completion the student will be able to develop a quality assurance program.	2

Course #	Course Title	Credit Hours
DMS-220	OBSTETRICAL SONOGRAPHY I COREQUISITE: DMS-205, DMS-207, DMS-216, DMS-230 PREREQUISITE: DMS-206 This course will provide instruction regarding the development and sonographic appearance of the fetal and extra-fetal anatomy throughout the gestation period. Assessment, lab values, and performance for determining gestational age and fetal viability will be studied. At completion, the student will be required to differentiate between normal and abnormal obstetrical studies. This is a CORE course.	3
DMS-221	OBSTETRICAL SONOGRAPHY II COREQUISITE: DMS-217, DMS-225, DMS-231, DMS-234, DMS-240, DMS-245 PREREQUISITE: DMS-220 This course will provide instruction regarding the sonographic appearance of fetal and extra-fetal anatomy and correlate findings of fetal anomalies and genetic links. Assessment, lab values, and performance for determining gestational age and fetal viability will be studied. At completion, the student will be required to differentiate between normal and abnormal obstetrical studies. This is a CORE course.	3
DMS-225	SUPERFICIAL SONOGRAPHY COREQUISITE: DMS-217, DMS-221, DMS-231, DMS-234, DMS-240, DMS-245 PREREQUISITE: DMS-207 This course will review the anatomy and familiarize students with scanning protocols for the thyroid, parathyroid, breast, scrotum, male pelvis and other superficial structures. Common pathologies will be discussed and correlated with other imaging modalities. Upon completion, students will identify protocols appropriate to specific techniques and will perform superficial sonograms. This is a CORE course.	1
DMS-229	SONOGRAPHY PRECEPTORSHIP I COREQUISITE: DMS-202, DMS-206, DMS-215, DMS-233 PREREQUISITE: Admission to program This course provides the sonography student with the opportunity to practice patient care skills and use beginning sonographic skills in a clinical environment. At course completion, the student should be able to provide basic patient care needs for the individual scheduled for a sonogram and create sonographic images pertinent to the current level of didactic training in general sonography specialties. Competencies will be required. This is a CORE course.	2
DMS-230	SONOGRAPHY PRECEPTORSHIP II COREQUISITE: DMS-205, DMS-206, DMS-216, DMS-220, DMS-230 PREREQUISITE: DMS-229 This course provides the student with the opportunity to develop additional sonographic skills in the clinical setting. The student will assist with and perform sonographic exams pertinent to the level of didactic training in general sonography specialties. Competencies will be required. This is a CORE course.	3
DMS-231	SONOGRAPHY PRECEPTORSHIP III COREQUISITE: DMS-217, DMS-221, DMS-225, DMS-234, DMS-240, DMS-245 PREREQUISITE: DMS-230 This course provides a continuum in the development of sonographic skills while in the clinical setting. Students should be able to perform more exams with less assistance from the supervising sonographer. Competencies will be required. This is a CORE course.	4
DMS-232	SONOGRAPHY PRECEPTORSHIP IV COREQUISITE: DMS-235, DMS-241, DMS-250 PREREQUISITE: DMS-231 This course will provide an in-depth practice of all sonographic skills in the clinical setting. Upon completion the student will perform general and/or specialty sonograms with little to no assistance from the supervising sonographer. Competencies will be required. This is a CORE course.	5
DMS-233	SONOGRAPHIC LAB I COREQUISITE: DMS-202, DMS-206, DMS-215, DMS-229 PREREQUISITE: Admission to program This course is designed to allow students the opportunity to improve their application of knowledge gained in other courses. Content will vary depending on student needs as determined by the instructor. Content may include General or Cardiovascular sonographic concepts.	1
DMS-234	SONOGRAPHY LAB II COREQUISITE: DMS-217, DMS-221, DMS-225, DMS-231, DMS-240, DMS-245 PREREQUISITE: DMS-231 This course is designed to allow students the opportunity to improve their application of knowledge gained in other courses. Content will vary depending on student needs as determined by the instructor. Content may include General or Cardiovascular sonographic concepts.	1

Course #	Course Title	Credit Hours
DMS-235	SONOGRAPHIC LAB III COREQUISITE: DMS-232, DMS-241, DMS-250 PREREQUISITE: DMS-234 This course is designed to allow students the opportunity to improve their application of knowledge gained in other courses. Content will vary depending on student needs as determined by the instructor. Content may include General or Cardiovascular sonographic concepts.	1
DMS-240	SONOGRAPHIC PRICIPLES & INSTRUMENTATION SEMINAR COREQUISITE: DMS-217, DMS-221, DMS-225, DMS-231, DMS-234, DMS-245 PREREQUISITE: DMS-216 This course provides a review for SONOGRAPHY PRINCIPLES AND INSTRUMENTATION Exam. Topics include sonographic principles and instrumentation. Mock registries must be passed with a grade of 75% or better to complete this course.	2
DMS-241	ABDOMINAL & OBGYN SEMINAR COREQUISITE: DMS-232, DMS-235, DMS-250 PREREQUISITE: DMS-240 This course provides a review for the National Registry Exam. Topics include abdominal, superficial, gynecological, and obstetrical sonography. Mock registries must be passed with a grade of 75% or better to complete this course. This is a CORE course.	3
DMS-245	SONOGRAPHY CASE PRESENTATIONS COREQUISITE: DMS-217, DMS-221, DMS-225, DMS-231, DMS-234, DMS-240 PREREQUISITE: DMS-230 Students are required to present cases with sonographic images, reports, patient history and symptoms and correlating reports from other exams/tests performed. The cases become the property of the program for use as future reference material. By the end of the term, students will have developed proficiency and expertise in case presentation.	1
DMS-250	INTRO TO ADVANCED SONOGRAPHY COREQUISITE: DMS-232, DMS-235, DMS-241 PREREQUISITE: DMS-231 This course will introduce students to any of the following: pediatric, vascular, cardiac, neurology, interventional, and orthopedic sonography. Advanced technologies in these fields will be researched. At completion, students will identify and describe skills and modalities in sonography.	3
DMS-260	INTRODUCTION TO VASCULAR SONOGRAPHY PREREQUISITE: As required by program. This course will introduce the student to sonographic anatomy of the vascular system of the human body, techniques and protocols for performing diagnostic studies of the vascular system. Common pathologies and anomalies, along with patient history, lab values, and symptomology will also be introduced in this course.CV CORE	3
DMS-261	VASCULAR SONOGRAPHY TECHNIQUES PREREQUISITE: As required by program. This course will familiarize the student with sonographic anatomy of the peripheral vascular structures of the human body. The student will learn techniques to perform spectral, color and angiographic Doppler of these vessels. Images will be correlated with other imaging modalities (i.e. computed technology, magnetic resonance, and angiography). The student will scan volunteers in order to develop skills in vascular analysis. At course completion student will be able to perform vascular sonograms. CV CORE	3
DMS-263	PATHOLOGY OF VASCULAR SYSTEMS PREREQUISITE: As required by program. This course will educate the student in common pathologies of the vascular system. Patient symptoms and history will be correlated with abnormalities seen. At completion students will be able to identify common abnormalities of the vascular system on sonograms. CV CORE	3
DMS-264	VASCULAR SONOGRAPHIC CLINICAL PREREQUISITE: As required by program. This course will allow the student to practice vascular scanning skills in the clinical setting. Competency will be sought in all types of peripheral vascular studies as well as correlation of studies with patient history, laboratory values and symptomology. At completion the student will be able to demonstrate practical application of vascular sonographic procedures.	5
DMS-270	INTRODUCTION TO CARDIAC SONOGRAPHY PREREQUISITE: As required by program. This course will introduce the student to sonographic anatomy of the cardiovascular system of the human body, techniques and protocols for performing a diagnostic study of the cardiovascular system. Common pathologies and anomalies, along with patient history, lab values, and symptomology will also be introduced in this course. CV CORE	3

Course #	Course Title	Credit Hours
DMS-271	ECHOCARDIOGRAPHIC TECHNOLOGY	3
	PREREQUISITE: As required by program. This course will familiarize the student with sonographic anatomy of the cardiovascular system of the human body. Techniques and protocols for performing a diagnostic study of the cardiovascular system will be presented. The lab will enable the student to practice echocardiographic scanning skills on volunteers in the campus lab. At completion, student will be able to perform basic echocardiograms. CV CORE	
DMS-273	PATHOLOGY OF CARDIOVASCULAR SYSTEM	3
	PREREQUISITE: As required by program. This course will educate the student in common pathologies and anomalies of the cardiovascular system. Patient history, lab values and symptomology will be correlated with abnormalities seen. At course completion the student will be able to identify common cardiac abnormalities on echocardiograms. CV CORE	
DMS-274	ECHO CLINICAL	5
	PREREQUISITE: As required by program. This course will allow the student to practice cardiac scanning skills in the clinical setting. Students will demonstrate competency in cardiovascular studies, including transthoracic, transesophageal, and intraluminal echocardiography.	