



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 19.
- 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 19 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	\$11,932	\$1,250	0	\$350
(Not including prerequisites)	4 Terms	52	\$8,164	\$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 accommodation:
 - Lift more than 50 pounds routinely
 - Push and pull routinely
 - Bend and stoop routinely
 - Have full use of both hands, wrists and shoulders
 - Distinguish audible sounds
 - Adequately view sonograms, including color distinctions
 - Work standing on their feet 80% of the time
 - Interact compassionately and effectively with the sick or injured
 - Assist patients on and off examining tables
 - Communicate effectively with patients and other health care professionals
 - Organize and accurately perform the individual steps in a sonographic procedure in the proper sequence

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.

Awards Available

Associate of Applied Science
Ultrasound
(Diagnostic Medical Sonography)

Program Contact

Brandi Merrill
Program Coordinator/Instructor
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Location: Trenholm Campus - Bldg. H

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

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

General Education Requirements (22 hours)

Area I - Written Composition (6 hours)

ENG-101 * English Composition I	3
ENG-102 English Composition II	3
ENG-130 Technical Report Writing	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
MTH-103 Intro to Technical Mathematics	3
MTH-104 Plane Trigonometry	3
MTH-110 Finite Mathematics	3
MTH-112 Precalculus Algebra	3
MTH-116 Mathematical Applications	3

Natural Sciences:

BIO-101 Introduction to Biology I	4
BIO-102 Introduction to Biology II	4
BIO-103 Principles of Biology I	4
BIO-104 Principles of Biology II	4
BIO-120 * Medical Terminology	3
BIO-201 * Human Anatomy & Physiology I	4
BIO-202 Human Anatomy & Physiology II	4
PHS-111 Physical Science I	4
PHS-112 Physical Science II	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.

History:

HIS-101 Western Civilization I	3
HIS-102 Western Civilization II	3
HIS-121 World History I	3
HIS-122 World History II	3
HIS-201 United States History I	3
HIS-202 United States History II	3

Social and Behavioral Sciences:

PSY-200 * General Psychology	3
PSY-210 Human Growth and Development	3
SOC-200 Introduction to Sociology	3
POL-200 Introduction to Political Science	3
POL-211 American National Government	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.	3
DMS-217 Sonographic Principles & Instr. Lab	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. 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. LAB 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. This is a CORE course.	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. Medical terminology is emphasized throughout this course. 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 in all general sonographic specialties 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 general sonographic skills in the clinical setting. Upon completion the student will perform general 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