

# CARDIAC SONOGRAPHY

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Students who complete the non-invasive Cardiac Sonography (CS) program of study will be prepared to enter the healthcare field in cardiac sonography labs as adult cardiac sonographers. Cardiac sonography, also known as echocardiography, is a rapidly advancing specialty area of cardiac imaging that uses ultrasound technology to evaluate the heart. With this technology, a cardiac sonographer uses sound waves created by the machine to acquire images of the cardiac chambers, walls, valves and blood flow.

The cardiac sonographer is a skilled person qualified by academic and clinical preparation to have:

- A detailed working knowledge of the anatomy and physiology of the heart
- The ability to optimize images
- A thorough understanding of cardiac pathology and its effects on the heart
- The ability to comprehend the sonographic appearance of normal and abnormal cardiac conditions.

Cardiac sonographers generally work closely with cardiologists, who use the images to diagnose cardiac diseases.

Students completing the Associate of Applied Science in Cardiac Sonography prepare to sit for the Registered Cardiac Sonographer (RCS) exam through Cardiovascular Credentialing International (CCI) and the Registered Diagnostic Cardiac Sonographer (RDSCS) exam through American Registry for Diagnostic Medical Sonography (ARDMS).

The CS program is in Fort Smith, AR.

The Cardiac Sonography Program is accredited by the Commission on Accreditation of Allied Health Education Programs (<https://www.caahep.org> (<https://www.caahep.org/>)), upon the recommendation of The Joint Review Committee on Education on Cardiovascular Technology (JRC-CVT).

Commission on Accreditation of Allied Health Education Programs  
25400 US Highway 19 North, Suite 158  
Clearwater, FL 33763  
(727) 210-2350

*Students who are pursuing a program of study where admission is limited (Cardiac Sonography, Cosmetology, Medical Assistant, Occupational Therapy Assistant, Paramedic/Emergency Medical Services, Physical Therapist Assistant, Practical Nursing and Registered Nursing), will be assigned a major of Associate of General Studies until admitted into their selected program.*

Students are advised that the Cardiac Sonography Program (CS) is strenuous in nature. Students are therefore not allowed to take additional course work that is not directly related to their degree plan while in the CS Program. If a student has completed all general education course requirements prior to entering the program, the student may not have a full load of twelve credit hours or more (which could affect financial aid eligibility). The CS program is very intense and requires approximately

30-40 hours per week of theory/lab/fieldwork. This estimate does not include prep or study time. The hours ascribed to each semester while in the CS Program are considered by the program to be full time.

## Programs

- Cardiac Sonography, Associate of Applied Science (<https://catalog.atu.edu/ozark/programs/cardiac-sonography/cardiac-sonography-aas/>)

## Courses

### CVT 2112 Hospital Policies and Patient Care

Prerequisite: Acceptance into the Cardiac Sonography program. Hospital Policies and Patient Care is an in-depth study of hospital departmental policies, procedures, protocols and work activities emphasizing ethics, attendance, dress codes/grooming standards and patient confidentiality. 2 Hours Lecture. Ozark Allied Health

### CVT 2123 Sonography Physics and Instrumentation I

Prerequisite: Acceptance into the Cardiac Sonography program. Sonography Physics and Instrumentation I includes physics of ultrasonic wave generation and propagation, transducer design, color flow imaging methodology, Doppler effect and Doppler instrumentation components, signal processing, basic equipment types, interactive properties of ultrasound with human tissues, possible biologic effects, information storage, contrast agents, quality control and image artifacts. 3 Hours Lecture. Ozark Allied Health

### CVT 2132 Echocardiography I Laboratory

Co-requisite: CVT 2133 Echocardiography I. Prerequisite: Acceptance into the Cardiac Sonography program. Lab skills practice to apply concepts presented in Echocardiography I. 4 hours laboratory. Ozark CF Cardiac Sonography

### CVT 2133 Echocardiography I

Co-requisite: CVT 2132 Echocardiography I Lab. Prerequisite: Acceptance into the Cardiac Sonography program. Echocardiography I is an introduction to echocardiography terminology and symbols, cardiac anatomy, cardiac embryology, intracardiac pressure gradients, hemodynamics, heart murmurs and scan planes. Sonographic protocol for normal echocardiogram studies will be introduced. 3 hours lecture. Ozark Allied Health

### CVT 2144 Clinical Practicum I

Prerequisite: Admission to the Cardiac Sonography program. Clinical Practicum I students are assigned to local hospitals and medical centers with direct supervision of a registered echocardiographer. This course demarcates the professional role of the echocardiographer, the patient-technologist relationship, and the interaction between the physical and allied health services. It also provides hands-on practice in a patient care setting. 12 hours clinical. Ozark Malpractice

### CVT 2211 Principles of Electrocardiography

Prerequisite: Admission to the Cardiac Sonography program. Principles of electrophysiology features the electrophysiology of the heart, basic waves, complexes and 12 lead EKG. The course emphasizes interpretation of normal sinus rhythm and advanced arrhythmias. The heart's electrical conduction system is explained. The course also introduces concepts essential to the performance and interpretation of exercise physiology, stress testing and Holter monitoring. 1 hour lecture. Ozark Allied Health

**CVT 2213 Cardiac Pathology Studies**

Prerequisite: Acceptance into the Cardiac Sonography program. An emphasis on adult cardiac pathologies with diagnosis, techniques, differential diagnoses, caveats, and epidemiology. Recognition of the sonographic appearance of cardiovascular disease is emphasized. This is achieved by focusing primarily on specific case studies. Basic pharmacology will be introduced. Laboratory values, signs, and symptoms of cardiac disease will be discussed. 3 Hours Lecture. Ozark Allied Health

**CVT 2223 Sonography Physics and Instrumentation II**

Prerequisite: CVT 2123 Sonography Physics and Instrumentation I and Acceptance into the Cardiac Sonography program. Continuation of Sonography Physics and Instrumentation I including physics of ultrasonic wave generation and propagation, transducer design, color flow imaging methodology, Doppler effect and Doppler instrumentation components, signal processing, basic equipment types, interactive properties of ultrasound with human tissues, possible biologic effects, information storage, contrast agents, quality control and image artifacts. 3 Hours Lecture. Ozark Allied Health

**CVT 2231 Echocardiography II Laboratory**

Co-requisite: CVT 2233 Echocardiography II. Prerequisite: CVT 2132 Echocardiography I Lab and acceptance into the Cardiac Sonography program. Lab skills practice to apply concepts presented in CVT 2233 Echocardiography II. 2 Hours Laboratory. Ozark Allied Health

**CVT 2233 Echocardiography II**

Co-requisite: CVT 2231 Echocardiography II Lab and acceptance into the Cardiac Sonography program. Prerequisite: CVT 2133 Echocardiography I. Echocardiography II includes advanced echocardiographic procedures. Sonographic protocol for abnormal studies will be presented. Areas of studies will include abnormal echocardiograms, transesophageal echocardiograms, exercise stress echocardiograms, pharmacologic stress echocardiograms, 3D transthoracic echocardiograms, 3d transesophageal echocardiograms and ultrasound enhanced agent echocardiograms. Common congenital abnormalities, postoperative anatomy, cardiac diseases, interventional procedures, emergency procedures, abnormal perfusion and function, and evaluation of pathophysiology of cardiovascular diseases are all discussed. 3 Hours Lecture. Ozark Allied Health

**CVT 2244 Clinical Practicum II**

Prerequisite: CVT 2144 Clinical Practicum I and acceptance into the Cardiac Sonography program. Clinical Practicum II students are assigned to supervised clinical experience in local hospitals and medical centers by sub-specialty areas with emphasis on set-up, calibration and operation of medical instrumentation. Patient history and physical exam techniques, performance of cardiovascular testing as well as analysis and interpretation of cardiovascular diagnostic tests and data are reviewed. 12 Hours Clinical. Ozark Malpractice Insurance

**CVT 2312 Interdisciplinary Cardiac Imaging**

Prerequisite: Admission into the Cardiac Sonography program. This course evaluates the major imaging modalities, other than echocardiography, used to evaluate the cardiac system. This course will include the basic study of computerized tomography, cardiac catheterization, nuclear medicine, magnetic resonance, and positron emission tomography in relation to echocardiography in the evaluation of the cardiac system. The advantages, disadvantages, technology, and accurate practice of each modality will be discussed. 2 hours lecture; Allied Health

**CVT 2313 Echocardiography Concepts**

Prerequisite: Acceptance into the Cardiac Sonography program. This course will prepare the student for the Cardio section of the ARDMS and CCI registry. Normal and abnormal anatomy and physiology, normal and abnormal perfusion and function, congenital anomalies, postoperative anatomy, protocols, treatments, and managing emergencies are all discussed. Multiple practice exams to better prepare the student for the registries will be given. 3 Hours Lecture. Ozark Cardiac Sonography

**CVT 2323 Physics Concepts**

Prerequisite: Acceptance into the Cardiac Sonography program. This course will prepare the student for the Sonographic Physics and Instrumentation section of the ARDMS and CCI registry. Ultrasonic wave generation and propagation, transducer design, color flow imaging methodology, Doppler effect and Doppler instrumentation components, signal processing, basic equipment types, interactive properties of ultrasound with human tissues, possible biologic effects, information storage, contrast agents, quality control and image artifacts are all reviewed. Multiple practice exams to better prepare the student for the registries will be given. 3 Hours Lecture. Ozark Allied Health

**CVT 2344 Clinical Practicum III**

Prerequisite: CVT 2244 Clinical Practicum II and acceptance into the Cardiac Sonography program. Students are assigned to local hospitals and medical centers with direct supervision of a registered echocardiographer. Performance of echocardiograms as well as analysis and interpretation of echocardiograms and data are reviewed. The student will have hands-on experience recognizing and detecting the echocardiographic characteristics of normal and abnormal heart function. 12 Hours Clinical. Ozark Allied Health

## Faculty Clinical Instructor

Candace Case