

## Course Number and Title: CVS 210 Scanning Applications

**Campus Location:**

Wilmington

**Effective Date:**

2022-51

**Prerequisite:**

ECH 112, VAS 112

**Co-Requisites:**

none

**Course Credits and Hours:**

1.00 credits

1.00 lecture hours/week

1.00 lab hours/week

**Course Description:**

This course is designed to integrate and apply previously learned knowledge and skills to strengthen sonographic knowledge and scanning techniques. Emphasis is on vascular studies of extremity arteries, extremity veins, and cerebrovasculature. A presentation of sonographic pathology research is also included.

**Required Text(s):**

Obtain current textbook information by viewing the [campus bookstore - https://www.dtcc.edu/bookstores](https://www.dtcc.edu/bookstores) online or visit a campus bookstore. Check your course schedule for the course number and section.

**Additional Materials:**

Sonography Student Manual

**Schedule Type:**

Classroom Course

**Disclaimer:**

None

**Core Course Performance Objectives (CCPOs):**

1. Employ Doppler principles to vascular sonographic studies. (CCC 2, 5, 6; PGC 2, 5)
2. Differentiate normal from abnormal extremity arterial, extremity venous, and cerebrovascular anatomy and hemodynamics. (CCC 1, 2, 5, 6; PGC 2, 5)
3. Interpret extremity arterial cases using patient medical history and testing data from arterial tests, including but not limited to pulse volume recording/segmental limb pressure (PVR/SLP), treadmill stress test, transcutaneous oximetry, and duplex imaging. (CCC 1, 2, 5, 6; PGC 2, 3, 5)
4. Explain the related anatomy, procedures, and applications in the evaluation of arterial bypass grafts/stents and hemodialysis access graft. (CCC 1, 2, 3, 4, 5, 6; PGC 2, 3, 4, 5)
5. Perform with competency lower extremity venous insufficiency evaluation using previously learned didactic and laboratory skill. (CCC 1, 2, 3, 4, 5, 6; PGC 2, 3, 4, 5)
6. Interpret carotid and vertebral cases using patient medical history, physical exam, and duplex imaging results. (CCC 1, 2, 3, 4, 5, 6; PGC 2, 3, 4, 5)
7. Integrate technical knowledge learned from previous vascular technology courses to solve mock board exam questions. (CCC 1, 2, 5, 6; PGC 2, 5)
8. Prepare a pathology research presentation independently to accurately form a sonographer's impression of the pathology. (CCC 1, 2, 3, 4, 5, 6; PGC 1, 2, 3, 4, 5)

See Core Curriculum Competencies and Program Graduate Competencies at the end of the syllabus. CCPOs are linked to every competency they develop.

**Measurable Performance Objectives (MPOs):**

Upon completion of this course, the student will:

1. Employ Doppler principles to vascular sonographic studies.
  1. Explain Doppler principles and the effect of transmitted frequency and Doppler angle on Doppler frequency shift.
  2. Distinguish continuous wave Doppler and pulsed wave Doppler and their applications.
  3. Explain Doppler knobology in the application of vascular sonographic studies.
2. Differentiate normal from abnormal extremity arterial, extremity venous, and cerebrovascular anatomy and hemodynamics.
  1. Identify upper and lower extremity arterial anatomy and anatomic variants.
  2. Differentiate normal arterial hemodynamic from pathological conditions.
  3. Identify upper and lower extremity venous anatomy and anatomic variants.
  4. Differentiate normal venous hemodynamic from pathological conditions.
  5. Identify intracranial and extracranial arterial anatomy and anatomic variants.
  6. Differentiate normal cerebrovascular hemodynamic from pathological conditions.
3. Interpret extremity arterial cases using patient medical history and testing data from arterial tests, including but not limited to pulse volume recording/segmental limb pressure (PVR/SLP), treadmill stress test, transcutaneous oximetry, and duplex imaging.
  1. Describe clinical signs and symptoms of extremity arterial diseases.
  2. Analyze a patient's risk factors of extremity arterial diseases.
  3. Explain diagnostic criteria in interpreting physiological testing results of PVR/SLP, treadmill stress test, and transcutaneous oximetry.
  4. Explain diagnostic criteria in interpreting extremity arterial duplex examination for stenosis/occlusion.
  5. Write a preliminary report based on patient history, diagnostic data, and diagnostic criteria.
4. Explain the related anatomy, procedures, and applications in the evaluation of arterial bypass grafts/stents and hemodialysis access graft.
  1. Describe anatomy of saphenous veins and the vein mapping techniques.
  2. Explain the saphenous vein's suitability and application as a bypass graft.
  3. Explain the pre-operative assessment of using the radial artery as a coronary artery bypass including the palmar arch test.
  4. Describe the types of grafts used commonly and their applications.
  5. Explain the assessment procedures and diagnostic criteria in the evaluation of arterial bypass grafts/stents.
  6. Explain the evaluation of hemodialysis access fistula and grafts, including indications for the exam, types of access, pre- and post-operative procedures, and interpretation.
5. Perform with competency lower extremity venous insufficiency evaluation using previously learned didactic and laboratory skill.
  1. Perform proper pre-examination preparation and acquisition of pertinent patient medical information in a laboratory scenario by selecting correct instrumentation, obtaining optimal machine setting, obtaining patient history and identifying clinical signs and symptoms, using proper patient positioning, safely assisting the patient for the procedure, and properly preparing and maintaining the patient area within the laboratory.
  2. Apply lower extremity venous insufficiency duplex protocol as outlined by the instructor.
  3. Perform required competency of lower extremity venous insufficiency to evaluate valvular incompetence.
6. Interpret carotid and vertebral cases using patient medical history, physical exam, and duplex imaging results.
  1. Describe clinical signs and symptoms of carotid and vertebral arterial diseases.
  2. Determine a patient's risk factors for carotid and vertebral arterial diseases.
  3. Explain diagnostic criteria in interpreting carotid and vertebral arterial diseases, including stenosis and occlusion.
  4. Write a preliminary report based on patient history, diagnostic data, and diagnostic criteria.
7. Integrate technical knowledge learned from previous vascular technology courses to solve mock board exam questions.
  1. Retrieve and integrate the following topics related to vascular sonography to solve mock board exam questions covering extremity arteries, extremity veins, and cerebrovascular vasculature.
8. Prepare a pathology research presentation independently to accurately form a sonographer's impression of the pathology.
  1. Describe a clinical pathology pertaining to technology by retrieving, organizing, analyzing, and interpreting data.
  2. Discuss disease process and complications of the pathology, including origin, signs and symptoms, risk factors, ultrasound involvement, and treatment.
  3. Create a PowerPoint presentation.
  4. Prepare and present orally in a professional manner.

**Evaluation Criteria/Policies:**

The grade will be determined using the Delaware Tech grading system:

90	-	100	=	A
80	-	89	=	B
70	-	79	=	C
0	-	69	=	F

Students should refer to the [Student Handbook - https://www.dtcc.edu/handbook](https://www.dtcc.edu/handbook) for information on the Academic Standing Policy, the Academic Integrity Policy, Student Rights and Responsibilities, and other policies relevant to their academic progress.

**Final Course Grade:**

Calculated using the following weighted average

Evaluation Measure	Percentage of final grade
Tests (3 tests of 10% each) (formative)	30 %
Final Exam (summative)	25 %
Lab Competencies: (summative)	
Lower Extremity Venous Duplex 10%, Venous Insufficiency 10%	30 %
Carotid Duplex 10%	
Pathology Research Presentation (summative)	10%
Assignment	
Take Home Review Question Pack (formative)	5%
TOTAL	100%

**Core Curriculum Competencies (CCCs are the competencies every graduate will develop):**

1. Apply clear and effective communication skills.
2. Use critical thinking to solve problems.
3. Collaborate to achieve a common goal.
4. Demonstrate professional and ethical conduct.
5. Use information literacy for effective vocational and/or academic research.
6. Apply quantitative reasoning and/or scientific inquiry to solve practical problems.

**Program Graduate Competencies (PGCs are the competencies every graduate will develop specific to his or her major):**

1. Perform competently a full range of echocardiography procedures.
2. Perform competently a full range of vascular sonographic procedures.
3. Utilize professional verbal, nonverbal, and written communication skills in patient care, procedure intervention, and professional relationships.
4. Act in a professional and ethical manner and comply with professional scope of practice.
5. Integrate critical thinking and problem solving skills as expected of a healthcare professional.

**Disabilities Support Statement:**

The College is committed to providing reasonable accommodations for students with disabilities. Students are encouraged to schedule an appointment with the campus Disabilities Support Counselor to request an accommodation needed due to a disability. A listing of campus Disabilities Support Counselors and contact information can be found at the [disabilities services - https://www.dtcc.edu/disabilitysupport](https://www.dtcc.edu/disabilitysupport) web page or visit the campus Advising Center.