

Principles of Vascular Technology (DSVT 2300)



Credit: 3 semester credit hours (2 hours lecture, 2 hour lab)

Prerequisite/Co-requisite: DSVT 1103.

Course Description

Introduction to non-invasive vascular technology modalities. Includes 2D imaging, Doppler, plethysmography, and segmental pressures. Emphasis on performing basic venous and arterial imaging and non-imaging exams.

Required Textbook and Materials

1. Techniques in Noninvasive Vascular Diagnosis, 3rd Ed., by Robert J. Daigle, BA, RVT ISBN# 978-0-9720653-6-8
2. Vascular Technology: an Illustrated Review, 4th Ed., by Claudia Rumwell, RN, RVT, FSVT; Michalene McPharlin, RN, RVT, FSVT ISBN# 0-941022-45-5

Course Objectives

Upon completion of this course, the student will be able to:

1. Describe fundamental vascular concepts of duplex and non-imaging procedures including positioning the patient, equipment, and other devices. (SCANS: F1, F2, F3, F4, F5, F6, F10, F11, F12, C5, C11, C12, C18)
2. Identify mechanisms of disease, physical signs of disease, and fluid dynamics in the presence of disease. (SCANS: F1, F2, F3, F4, F5, F6, F10, F11, F12, C5, C11, C12, C18).

SCANS Skills and Competencies

Beginning in the late 1980's, the U.S. Department of Labor Secretary's Commission on Achieving Necessary Skills (SCANS) conducted extensive research and interviews with business owners, union leaders, supervisors, and laborers in a wide variety of work settings to determine what knowledge workers needed in order to perform well on a job. In 1991 the Commission announced its findings in *What Work Requires in Schools*. In its research, the Commission determined that "workplace know-how" consists of two elements: Foundation skills and workplace competencies.

Course Outline

I. Arterial Testing

- | | |
|----------------------------------|-----------------------|
| A. Fluid/hemodynamics | c. Reynolds Number |
| a. Heart pump | d. Laminar Flow |
| b. Energy | e. Energy losses |
| c. Gradient | f. Collateral effects |
| d. Types of flow | g. Exercise |
| B. Characteristics of Blood Flow | C. Arterial Testing |
| a. Bernoulli | a. History |
| b. Poiseuille's Law | b. Disease |

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- D. Arterial Doppler
 - a. Advantages
 - b. Disadvantages
 - c. Qualitative
 - d. Quantitative
 - e. Analog
 - f. Spectral
- E. Doppler Segmental Pressure
- F. Penile Testing
- G. Plethysmography
 - a. Upper and Lower Extremity
 - b. Digital Testing
 - a. tcPO₂
- H. Duplex Imaging and Color Flow
 - a. Upper Extremity
 - b. Lower Extremity
 - c. Abdomen
 - d. Arterial mapping
- I. Misc. Conditions and Tests
 - a. Diseases
 - b. Therapeutic and Invasive Tests
- II. Cerebrovascular Testing**
 - A. Carotid
 - a. Physical Exam
 - b. History and physical exam

Grade Scale

| | |
|---------------|-----------------|
| 93 – 100 | A |
| 85 – 92 | B |
| 75 – 84 | C |
| 68 - 74 | D (not passing) |
| 73.5 or below | F |

Course Evaluation

| | |
|------------|-----------|
| Unit tests | 95% |
| Homework | <u>5%</u> |
| | 100% |

Course Requirements

1. Unit tests
2. Homework
3. Textbook

- B. Transcranial
- C. Misc. condition and tests
 - a. Diseases
 - b. Therapeutic and Invasive Test
- III. Venous Testing**
 - A. Hemodynamics
 - B. Mechanisms of Disease
 - a. Patient History
 - b. Disease
 - c. Physical Exam
 - C. Plethysmography
 - a. Impedance
 - b. Strain Gauge
 - c. PPG
 - d. Air
 - D. Duplex and Color Flow Imaging
 - a. General Information
 - b. Lower Extremities
 - c. Abdomen
 - d. Misc. Conditions and tests
- IV. Quality Assurance and Safety**
 - A. Statics
 - B. Infection Control

Course Policies

1. No food, drinks, or use of tobacco products in class.
2. Beepers, cell phones, head phones and any other electronic devices must be turned off while in class.
3. Do not bring children to class.
4. If a unit test is missed, arrangements will be made with the instructor to take the test in a timely manner.
5. Attendance Policy: Absences must be limited to serious illness and/or immediate family emergencies. Unexcused absences are not allowed. Three (3) absences will result in a letter grade reduction.
6. Tardiness is discouraged. Excessive tardiness (more than 10 minutes/class) (or more than 2 consecutive classes) will result in an absence being awarded.
7. In the event that LIT is forced to cancel classes due to inclement weather, DMSO/DSEAE classes and clinical rotations will also be cancelled. Notification of closures will be made through local radio and TV stations.
8. If you wish to drop a course, the student is responsible for initiating and completing the drop process. If you stop coming to class and fail to drop the course, you will earn an "F" in the course.

Disabilities Statement

The Americans with Disabilities Act of 1992 and Section 504 of the Rehabilitation Act of 1973 are federal anti-discrimination statutes that provide comprehensive civil rights for persons with disabilities. Among other things, these statutes require that all students with documented disabilities be guaranteed a learning environment that provides for reasonable accommodations for their disabilities. If you believe you have a disability requiring an accommodation, please contact the Special Populations Coordinator at (409) 880-1737 or visit the office in Student Services, Cecil Beeson Building.

Course Schedule

| Week | Topic | Reference |
|---------------|---|--|
| Week 1 | Fluid/Hemodynamics Characters of flow | Rumwell: pgs. 15-37 Daigle: pgs. 141-148 |
| Week 2 | Arterial Testing Arterial Doppler | Rumwell: pgs. 39-50; Daigle: pgs. 150-158 Rumwell: pgs. 51-62; Daigle: pgs. 159-162 |
| Week 3 | Test 1 (TBA) Doppler Segmental Pressure | Rumwell: pgs 63-74 Daigle: pgs. 162-170 |
| Week 4 | Doppler Segmental Pressure Penile Testing | Rumwell: pgs 75-81 Daigle: pgs. 225-228 Rumwell: pgs. 87-92; Daigle: pgs. 239-246 |
| Week 5 | Plethysmography | Rumwell: pgs. 93-116; Daigle: pgs. 171-176 Rumwell: pgs. 117-; Daigle: pgs. 171-176 |

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| Week | Topic | Reference |
|----------------|---|---|
| Week 6 | Test 2 (TBA) Duplex Upper & Lower | Rumwell: pgs. 117-136; Daigle: pgs. 135-137,199-208 |
| Week 7 | Duplex Abd & Mapping Misc conditions and tests | Rumwell: pgs. 137-164; Daigle: pgs. 209-213,281-300 Rumwell: pgs. 165-190 |
| Week 8 | Carotid Artery Transcranial Doppler Misc Conditions and tests | Rumwell: pgs.199-240; Daigle: pgs. 26-67 Rumwell: pgs.241-246; Daigle: pgs. 259-279 Rumwell: pgs. 247-260 |
| Week 9 | Test 3 (TBA) Venous Hemodynamics & Disease | Rumwell: pgs. 275-288; Daigle: pgs. 84-88 |
| Week 10 | Plethysmography Duplex & Color Information | Rumwell: pgs. 289-305 Rumwell: pgs. 307-315; Daigle: pgs. 1-22 |
| Week 11 | Test 4 (TBA) Duplex Lower Extremities | Rumwell: pgs. 313-337; Daigle: pgs. 91-111 |
| Week 12 | Duplex Upper Extremities Abdomen | Rumwell: pgs. 321-337; Daigle: pgs. 127-139 Rumwell: pgs. 313-337; Daigle: pgs. 296-300 |
| Week 13 | Misc Conditions and tests | Rumwell: pgs. 349-358 |
| Week 14 | Hemodialysis Access Fistulas and Grafts | Daigle: pgs. 247-257 |
| Week 15 | Statics Patient Safety | Rumwell: pgs. 349-355 Rumwell: pgs. 357-358 |
| Week 16 | Test 5 (TBA) | |

Contact Information

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