

LABETTE COMMUNITY COLLEGE BRIEF SYLLABUS

SPECIAL NOTE:

This brief syllabus is not intended to be a legal contract. A full syllabus will be distributed to students at the first class session.

TEXT AND SUPPLEMENTARY MATERIALS USED IN THE COURSE (if any):

Please check with the LCC bookstore <http://www.labette.edu/bookstore> for the required texts for this class.

COURSE NUMBER: DMS 230

COURSE TITLE: INTRODUCTION TO VASCULAR SONOGRAPHY

SEMESTER CREDIT HOURS: 2

DEPARTMENT: Diagnostic Medical Sonography

DIVISION: Health Science

PREREQUISITES: Acceptance into the Sonography Program

COURSE DESCRIPTION:

This course is an introduction to the vasculature anatomy, location, and different waveforms. The student will learn different approaches and techniques to vascular ultrasonography. This course will introduce the student to Doppler imaging of the abdomen, extremities, intracranial vessels, and Ankle brachial indexes, and Plethysmography.

COURSE OUTCOMES AND COMPETENCIES:

Students who successfully complete this course will be able to:

1. Describe the normal anatomy and variants, function, and Sonographic appearance of the major abdominal vasculature.
 - Describe the arteries and veins of the abdomen including but not limited to: aorta, IVC, portal, hepatic, renal, splenic, and mesenteric.
 - Differentiate between portal and hepatic flow in the liver.
 - Correlate the clinical indications and laboratory values associated with vascular disease.
 - Indicate the protocol for Sonographic assessment of the abdominopelvic vasculature.
 - Describe the different modalities including MRI, computed tomography, angiography, nuclear medicine and MR flow meter used to evaluate vasculature in the abdomen, neck, head, and extremities.
 - Identify laminar vs. turbulent flow characteristics and waveforms.
 - Discuss triphasic, biphasic, and monophasic waveforms in the artery.
 - Recognize tardus parvus waveform in diseased vessels.

2. Describe the normal anatomy and variants, flow, and sonographic appearance of the aortic arch, carotid arteries, and vertebral arteries.

- Explain the relationship between high and low pressure, flow, and resistance in the arteries, veins of the chest and neck.
- Explain the impact of variations in fluid viscosity on blood flow.
- Identify the branches off the aortic arch.
- Distinguish between the ICA and ECA size, location, waveforms, and high and low resistance.
- Discuss the difference between antegrade vs. retrograde flow in the vertebral arteries.
- Compare the aorta artery to the inferior vena cava size, waveforms, and color filling.

3. Perform duplex scanning, color flow imaging, and identify the vasculature of the upper extremities and lower extremities.

- Identify the normal anatomy of the artery and veins of the upper extremities including the subclavian, brachial, radial, ulnar, and the palmar arch.
- Evaluate the normal vs. tardus parvus Doppler waveforms.
- Recognize the difference between positive and negative Doppler shifts.
- Label the normal anatomy of the lower extremity vasculature including but not limited to iliac, superficial femoral, popliteal, peroneal, and tibias.
- Explain the extremity imaging limitations including dressings, skin, staples, sutures, or open wounds.
- Perform the Allen test to evaluate patency of the wrist arteries and palmar arch.
- Prepare the patient and room for extremity imaging.
- Select the proper frequency transducer for the specific structure being imaged
- Perform compression, and augmentation on the vein being imaged.
- Differentiate different MSK structures being imaged

4. Identify the gross anatomy, physiology, and fluid dynamics of the intracranial cerebrovascular system.

- Locate and label the normal anatomy of the circle of Willis within the cranium.
- Recognize the direction of blood flow within the vessels of the circle of Willis.
- Explain the location of the basal artery as it connects the posterior circulation of the circle of Willis.
- Identify the Bernoulli principle within the vessel.
- Perform proper transducer placement while scanning intracranial vessels.
- Describe the location of the ophthalmic artery as it comes off the ICA.
- Distinguish between normal and abnormal blood flow in the cranium.
- Perform the transcranial Doppler TCD to assess intracranial flow.

5. Evaluate the Doppler segmental pressures of the upper and lower extremities.

- Identify the presence of severity of arterial occlusive disease.
- Apply the blood pressure cuffs to the correct location of the extremities.
- Manipulate the machine and the cuffs to perform the segmental test.
- Explain the location of disease by reading the different pressures.
- Perform an ankle brachial index on patients with decreased pressures.
- Describe the patient preparation and positioning for each test.
- Explain the difference between continuous wave and pulsed waves.
- Recognize cuff artifact resulting in inaccurate pressures.
- Illustrate the how to calculate the ankle pressure by the higher of the two brachial pressures.

6. Explain the Plethysmography technique of the upper and lower extremities.

- Detect presence/absence of arterial disease.
- Identify the difference between true arterial claudication from nonvascular sources.
- Localize the level of obstruction.
- Determine the limitations of plethysmography including obesity, collateral branches, and patient positioning.
- Distinguish between Photoplethysmography PPG, Strain gauge Plethysmography SPG, Oculopneumoplethysmography OPG-Gee, and displacement plethysmography.
- Interpret plethysmography waveforms normal vs. abnormal.