

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 214

COURSE TITLE: INTRODUCTION TO ECHOCARDIOGRAPHY

SEMESTER CREDIT HOURS: 3

DEPARTMENT: DMS

DIVISION: Health Science

PREREQUISITES: Sonography Certification or one year experience in the field of Sonography

REVISION DATE: 1/16/2014

COURSE DESCRIPTION:

This course will serve as an introduction to the study of basic heart anatomy and physiology. The course will include different types of pathology, valve disease, transthoracic, parasternal, Apical, Subcostal, Transesophageal Suprasternal windows, stress testing, basic embryology and fetal circulation, congenital anomalies, and 3D/4D echocardiography. This course will include video links, forums, quizzes, and testing.

COURSE OUTCOMES AND COMPETENCIES:

Students who successfully complete this course will be able to:

1. Identify the normal anatomy of the heart and circulatory system.

- Differentiate between the systemic circulatory system and pulmonary circulatory system and describe how they work together.
- Discuss basic adult cardiac anatomy, to include the hearts location, pericardium, wall layers, chambers (including their normal pressures and oxygen saturation levels) and vessels.
- Identify the order of blood flow as it travels through the cardiovascular system.
- Differentiate between the cardiac valves, to include their function, location, relation to the cardiac cycle, and normal parameters.

- Define the components of the cardiac cycle: isovolumic contraction time, systole, isovolumic relaxation time, diastole and their relation to the cardiac chambers, valves, and overall function.
- List and define the components related to cardiac output (preload, afterload, inotropic force, and equations pertaining to cardiac output).
- Discuss the basic coronary artery system, venous system, and conduction system.

2. Demonstrate and recognize the different windows for performing an echocardiogram.

- Define and utilize basic echocardiography terminology.
- Discuss the modes of echocardiography, to include M-mode, 2-Dimensional echocardiography, color flow Doppler, and spectral Doppler
- Describe the basic transthoracic, Transesophageal, Apical, Suprasternal, and Subcostal windows.
- Describe the advantages vs. the disadvantages.
- Identify the roles of the Cardiac sonographer, Physician, and Nurse during a TEE procedure.
- Identify the four basic types of TEE scanning.
- Patient limitations to imaging in all planes.

3. Differentiate between the different types of replacement heart valves and recognize identify the types of aortic disease.

- Classify the two main types of prosthetic heart valves, mechanical versus bioprosthetic, to include some of the different types and common brand names.
- List and label the complications associated with a prosthetic heart valve.
- Outline the 2D, M-mode, and Doppler findings of the prosthetic heart valve patient, to include the normal flow patterns seen with some of the more common prosthetic heart valves.
- Explain the rationale behind prosthesis selection for patients undergoing valve replacement.
- Discuss aortic dissection including the definition, etiology, signs, symptoms, and complications.
- Point out the anatomy of the aorta, the different types of aortic dissection, and classify them by the Stanford system and the DeBakey system.
- Explain the importance of performing a “complete” echocardiogram on every patient paying particular attention to the aorta and its available views.
- Explain additional diseases of the aorta including their definitions, etiology, and echocardiography findings. Sinus of Valsalva aneurysm, coarctation of the aorta, Marfan syndrome, and aortic aneurysm.

4. Evaluate basic embryology of the heart and assess some of the more common congenital anomalies to their definitions, prevalence, hemodynamic effects, and associated anomalies.

- Select the echocardiography views utilized to detect the discussed congenital anomalies.
- Identify the more common anomalies including ASD, VSD, PDA, endocardial cushion defect, cleft mitral valve, pulmonic stenosis, coarctation of the aorta, Ebstein anomaly, Tetralogy of Fallot, Transposition of the great arteries, Hypoplastic, and other associated defects.
- Recall basic embryology of the heart through the seventh week of development.
- Explain the circulatory changes that occur at birth.
- Summarize fetal circulation by tracing blood from the placenta, through the fetus, and back to the placenta again.

5. Compare the advantage vs. the disadvantage of using Stress Echocardiogram (SE) and Cardiac Catheterization.

- Explain the definition, purpose, advantages, indications, and contraindications of stress echocardiography.
- Calculate the maximum predicted heart rate and target heart rate.
- Recognize the left ventricular walls and their corresponding coronary artery.
- List the criteria for a positive stress echocardiography diagnosis.
- Discuss the procedure and instrumentation utilized in stress echocardiography, to include the treadmill stress echo, supine bicycle stress echo, and Dobutamine stress echo.
- Apply patient education while preparing the patient for a stress echo.