-

LINCOLN UNIVERSITY

DI 255 – Advanced Echo Imaging
Fall 2017 Course Syllabus

Dates: 08/23/2017 – 12/06/2017

Course Number: DI 255

Course Title: Advanced Echo Imaging

Credit Hours: 4 units = 3 units of lectures + 1 unit of laboratories
(75 total contact hours = 45 hours of lectures + 30 hours of lectures)

Lectures: Wednesdays 12:30 pm – 3:15 pm

INSTRUCTOR: Oxana Ostanina, MD, RDCS

Laboratories: Wednesdays 6:30 pm – 9:15 pm (02/11/15-04/22/15)

INSTRUCTOR: Ms. Diana Wagle, RDCS

CONTACT INFORMATION: ostanina@lincolnuca.edu

OFFICE HOURS: By arrangement

RESOURCE OF MATERIALS:

Echocardiography:

Echocardiographer's Pocket Reference, 4th edition [Spiral-Bound], 2013 or 3rd edition [Spiral-Bound], 2008, Terry Reynolds.

ISBN-10: 001405101X, ISBN-13: 978-0014051014

Textbook of Clinical Echocardiography, 5th edition, Catherine M. Otto, MD, 2013

ISBN-10: 0323227589
ISBN-13: 978-0323227582

Echocardiography Review Guide: Companion to the Textbook of Clinical Echocardiography 2nd edition, Catherine M. Otto and Rebecca G. Schwaegler, 2011

ISBN-10: **1437720218,** ISBN-13: **978-1437720211**

Additional recommended textbooks and instructional materials will be given during classes.

COURSE DESCRIPTION:
A continuation of study of imaging methods and technology based on 2-dimensional echo, M-Mode, and Doppler sonographic imaging. Applications to recording and interpretation of echo imaging for detection of heart abnormalities are emphasized. (4 units)
Prerequisite: DI 245

LEARNING OUTCOMES:

This advanced echocardiography course utilizes a ”Case Studies Based Approach”. Upon satisfactory completion of this course, the students will be able to:

- Utilize Two-dimensional echocardiography and M-Mode modalities to identify and assess the normal and abnormal anatomical structures of the heart and great vessels in patients with congenital abnormalities and heart assist devices, heart transplants.
- Spectral and Color Doppler – identify and evaluate direction and velocity information given in the color and spectral Doppler images/waveforms in patients with congenital abnormalities and heart assist devices.
- Doppler Calculations – perform Doppler calculations, i.e., stroke volume, cardiac output and valve areas and shunts.
- EKG and Auscultation – describe commonly encountered abnormal EKG findings. Explain normal and abnormal heart sounds and their relationship to the cardiac cycle and role of echocardiography in evaluation of the
- Systolic and Diastolic Function – perform echocardiographic measurement parameters to assess LV and RV systolic and diastolic dysfunction in patients with cardiac and noncardiac disorders. Utilizing contrast agents in evaluation of the heart.
- LA, RA, and RV Function – explain and describe the echocardiographic measurement parameters that assess LA, RA and RV normal and abnormal function.
- Introduction to Trans Esophageal echocardiography and role of the sonographer. Introduction to Tree-Dimensional echocardiography and other methods of evaluation of the heart diseases.
- Examination – utilize protocols recommended by the ASE in the complete transthoracic echocardiogram of the heart abnormalities.

INSTRUCTIONAL METHODS:

- Lectures and assigned reading material
- Internet resources
- Group discussions and ultrasound case analyses

- Student will complete worksheets for each echo case discussed during the lecture.
- A journal article review evaluation (there will be an article from the ASE journal assign to each student for reading and review. The article review should be 1-2 pages and include: summary of the article echo findings associated with the research topic, your additional research on the topic, your conclusion on the topic).

REQUIREMENTS:

- **Ultrasound Hands-on Laboratory Training**

  Practical experience students will gain under the guidance of a lab instructor. Students are expected to arrive at class on time, and stay through the end of the ultrasound laboratory class.

ATTENDANCE AND PARTICIPATION:

- Class attendance is required, beginning with the first class meeting, and students are expected to attend all class sessions for which they are registered.
- Promptness is required.
- It is the responsibility of the student to make arrangements for all course work missed because of legitimate class absences and to notify the instructor when an absence will occur.
- Excessive absence or tardiness may result in loss of credit, lowering of grade, or dismissal from the university.
- Cell phones MUST be turned off before class begins. Students are not allowed to use cell phones during the class.

EVALUATION:

- **Quizzes:**
  - The student will take 3-4 quizzes 10-15 questions each at the beginning of the class.
  - These quizzes will address the detailed content and major concepts presented in the lectures, lecture outlines, text readings, and study guide activities.
  - Each quiz will be timed, 72 seconds for every question to complete.
  - Late assignments will not be collected or graded.
  - No make-up quizzes for missed quizzes will be administered (the student will receive no score for missed quizzes).
  - All quizzes and exams may include a video portion to assess identification and recognition of echocardiographic structures, views, and or measurements.

- **Midterm & Final Examinations:**
  - Midterm consists of 50 questions and final examination of 100 questions.
  - The written examinations are proctored and will be closed-book exams.
  - The Scranton machine will be used in grading multiple-choice tests.
  - A student MUST take the exam during the scheduled time period.
  - A student missing an exam because of an illness or legitimate emergency may take a make-up exam as soon as possible after the student returns from the illness and as determined by the instructor. Absences covering such emergencies as serious illness or similar may be excused by the Dean provided the absence is properly documented.
  - If no excuse is received by the Records Office, the student will be considered as having no excuse.

- **Ultrasound Hands-on Laboratory Examination:**
  - In the final ultrasound hands-on examination, students have to demonstrate understanding of information presented during lectures and hands-on laboratory training.
  - Students have to perform echocardiographic protocols and demonstrate scanning technique and images in B-, Color-Modes, and M-mode.
  - Students will schedule the time and date 2-3 weeks ahead of the Ultrasound hands-on laboratory examination.

GRADING:

GRADING		**%**
LECTURE	Final Exam	30
	Midterm	20
	Presentation	10
	Attendance lecture classes	10
LABORATORY	Performing of scanning protocol	20
	Attendance lab classes	10
TOTAL		100

90-100%	A
80 – 89 %	B
70 – 79%	**C**
60 – 69 %	D
<59 %	F

SCHEDULE:

WEEKS	DATE	TOPICS	PRACTICE	HOME WORK
WEEK 1	08/23	Transesophageal echocardiography. Basic views, standard examination.		Review echo study
WEEK 2	08/31	Transesophageal echocardiography. Essential views and structures in specific clinical situations.		
WEEK 3	09/06	Stress echocardiography and hemodynamics evaluation. Contrast agents.		Review echo study
WEEK 4	09/13	Myocardial velocity and strain imaging. Dyssynchrony and Resynchronization.	Practice set up lab equipment for TEE. Work in a group of three people to "perform TEE".	
WEEK 5	09/20	Echocardiography in patients with ventricular assist devices. Heart transplant.	Practice set up equipment for stress echo. Practice basic images for stress echo study.	Review echo study
WEEK 6	09/27	Cases study: aortic valve disease.	Perform all steps for evaluation of aortic stenosis.	
WEEK 7	10/04	Midterm (lectures)	Perform all steps for evaluation of aortic regurgitation.	
WEEK 8	10/11	Cases study: mitral valve disease.	Perform all steps for evaluation of mitral stenosis.	Review echo study
WEEK 9	10/18	Cases study: echocardiography in the emergency room.	Perform all steps for evaluation of mitral regurgitation.	
WEEK 10	10/25	Cases study: pericardial diseases, pulmonary hypertension and pulmonary embolism. Contrast agents in diagnosis.	Perform all steps for evaluation of pulmonary hypertension. Right heart systolic and diastolic function evaluation.	Review echo study

WEEK 11	11/01	Cases study: sepsis, hypotension, fever unknown origin.	Perform all steps to evaluate pericardial disease and tamponade.	
WEEK 12	11/08	Cases study: congenital heart diseases in adults. Evaluation after surgical correction.	Systemic hypertension evaluation.	
WEEK 13	11/15	Echo guidance of cardiac procedures, ASD, PFO Three-dimensional echocardiography.	Perform all steps for evaluation of ASD and VSD.	Article review due
WEEK 14	11/29	Cases study: echocardiography in noncardiac disorders.	Perform all steps of Bicuspid valve evaluation. Coarctation of the aorta.	
WEEK 15	12/06	Final examination	Perform Full protocol, you will be assign to perform evaluation of any pathology listed in syllabus.	

Syllabus Revised on 08/15/2017 (the syllabus is subject to change at any time)

Appendix. Program and Institutional Learning Outcomes.

Institutional Learning Outcomes (ILOs)	
Graduates of the BS program of Lincoln University should be able to:	
1a	Develop the habits and skills necessary for processing information based on intellectual commitment, and using these skills to guide behavior.
2a	Raise important questions and problems, and formulate them clearly and precisely in oral or written communication
3a	Act with dignity and follow the principles concerning the quality of life of all people, recognizing an obligation to protect fundamental human rights and to respect the diversity of all cultures.
4a	Focus on individual and organizational benefits; communicate to co-workers and company's leadership in facilitation of collaborative environment; to be honest and transparent with regard to their work, and to be respectful of the work of others.
5a	Display sincerity and integrity in all their actions, which should be based on reason and moral principles; to inspire others by showing mental and spiritual endurance
6a	Show creativity by thinking of new and better goals, ideas, and solutions to problems; to be resourceful problem solvers.
7a	Define and explain the boundaries, divisions, styles and practices of the field, and define and properly use the principal terms in the field

Program Level Outcomes (PLOs)	
Students graduating our BS in Diagnostic Imaging program will be able to:	
1	Develop and demonstrate knowledge in principles of UT, medical terminology, physiology, sonography, and echocardiography.
2	Demonstrate ability of accurate patient positioning techniques, and use of imaging technology
3	Adapt imaging procedures based on patient's needs and clinical limitations.
4	Practice effective oral and written communication skills in the clinical setting