



LINCOLN UNIVERSITY

DI 255 – Advanced Echo Imaging

Fall 2016 Course Syllabus

Dates: 08/22/2016 – 12/10/2016

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: Tuesdays 9:00 – 12.00 Am

Lab: Tuesdays 12:00 – 3.00 Pm (09/13/2016- 11/15/2016)

Instructor: Dr. Seyed A Sadatian, RDMS (Abd), RVT, RDCS

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Office Hours: Tuesdays & Thursdays 3:00 – 3:30 PM or by appointment

Prerequisite: DI 245

Resource of Material:

ASE's Comprehensive Echocardiography, 2nd edition, 2016, Roberto M. Lang et al
ISBN: 978-0-323-26011-4

Textbook of Clinical Echocardiography, 4th edition, Catherine M. Otto, MD, 2009
ISBN-10: 1416055592, ISBN-13: 978-1416055594

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

Echocardiographer's Pocket Reference, 3rd edition [Spiral-Bound], 2008, Terry Reynolds
ISBN-10: 001405101X, ISBN-13: 978-0014051014

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)

Learning Objectives:

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

- Utilize 2-D,3-D & 4-D 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 heart murmur.
- 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.
- Utilize transesophageal echocardiography and role of the sonographer.
- Utilize three-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.
- Students will complete worksheets for each echo case discussed during the lecture.
- A journal article review. An article from the ASE journal will be assigned 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, and your conclusion on the topic.

Requirements:

- This is a lecture-lab course in which lecture topics are presented by the instructor, and the ultrasound hands-on lab practice is explained and demonstrated by the lab instructor.
- Students are expected to be prepared in advance before the class sessions.
- Being prepared includes the following: having read text materials (e.g., textbook readings, and lecture outlines) assigned for that day's activities and bringing required work materials (e.g., textbook, handouts, writing supplies, etc.) to the session.

- Homework will include reading the topics one week ahead of time.
- Students are expected to attend and participate in all lectures and activities, and complete all quizzes, examinations and course assignments on time. Therefore an attendance and being on time are crucial to your final grade.
- Students must budget time efficiently and be realistic about all personal and professional commitments that consume time.

Academic Honesty

The University maintains a strict policy concerning academic dishonesty, which includes cheating, plagiarism, giving assistance on an examination or paper when expressly forbidden by the instructor, and any other practices which demonstrate a lack of academic integrity. It is the responsibility of the students to know and to adhere to principles of academic honesty. A student found guilty of academic dishonesty will be subject to academic sanctions ranging from failure on the assignment to failure in the course too.

Ultrasound Hands-on Laboratory Training

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

Course Guidelines:

- 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 students 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.

Homework:

The goal of the homework is to help students achieve the course learning objectives. Homework consists of two parts. First part is to read the textbooks and materials to review and analyze the lecture given during a previous class session. Students are expected to spend six hours for each class session outside of class in completing the reading assignments related to each lecture. These assignments are graded through short quizzes given at the beginning of the following class session. Second part of the homework is a journal article review. An article from the ASE journal will be assigned to each student. 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, and your conclusion on the topic. The review report must be submitted on November 28, 2016.

Evaluation Criteria for Article Review Report:

- Summary of the article: 2%
 - Findings related to the topic: 3%
 - Additional research on the topic: 2%
 - Conclusion on the topic: 3%
- Total: 10% of all the course grading elements

TESTING:**Quizzes:**

Students will take 10 quizzes; 10-20 questions each. These quizzes will address the detailed content and major concepts presented in the lectures, lecture outlines and text readings to evaluate students' work outside of the classroom. Each quiz will be timed, 72 seconds for every question to complete. All quizzes and exams may include a video portion to assess identification and recognition of echocardiographic structures, views, and or measurements. No make-up quizzes for missed quizzes will be administered (students will receive no score for missed quizzes).

Midterm and 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:

- During 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.

Lab Grading:**Scanning Performance: 10%**

Effective use of lab time, demonstrating development of scanning skills, applying scan techniques, effective use of ultrasound machine controls, IE: TGC, Depth PRF, Freq.

Transducers, and improving images on each patient. Complete/full participation and working during class time is expected. Students are encouraged to use open lab time as needed. Students are required to complete 20 hours in lab self-study (with 6 independently performed studies, which would represent date and student's name on each ultrasound image).

Scanning project; 10%

During course each person should scan 5 kids and 5 adults (over 40-year old)

Attendance: 10%

Absences, late arrival, poor use of class times, early leaves will result in students' poor or failing grade.

GRADING:

Grading		%
Lecture	Final Exam	20
	Midterm Exam	20
	Journal Article Review	10
	Quizzes	10
	Attendance	10
Laboratory	Scanning + Project	20
	Attendance	10
Total		100

%	Grades
100-94	A
93-90	A-
89-87	B+
86-84	B
83-81	B-
80-78	C+
77-76	C
75-74	C-
73-72	D+
71-70	D
69<	F

Schedule: DI 255 – Advance Echo Imaging Fall 2016

Weeks	Dates	Lecture	Lab	Quiz
Week 1	08/23/2016	Arrhythmia & Echo Dyssynchrony and Resynchronization		
Week 2	08/30/2016	Stress echocardiography and hemodynamics		1
Week 3	09/06/2016	Valvular review		2
Week 4	09/13/2016	. Systemic & Pulmonary Hpertension		3

Week 5	09/20/2016	Pericardial Diseases 3-D / 4-D Echocardiography		4
Week 6	09/27/2016	Transesophageal echocardiography. Basic views, standard examination.	Practice set up equipment for stress echo. Practice basic images for stress echo study.	5
Week 7	10/04/2016	Midterm (lectures)	3-D / 4-D Scanning	
Week 8	10/11/2016	Myocardial velocity and strain imaging. Contrast agents	Evaluation of aortic Stenosis & regurgitation	
Week 9	10/18/2016	Ischemic heart diseases & echo	Perform all steps for Evaluation of mitral stenosis & regurgitation	7
Week 10	10/25/2016	Echocardiography in patients with ventricular assist devices. Heart transplant.	Evaluation of pulmonary hypertension. Right heart systolic and diastolic function evaluation.	8
Week 11	11/01/2016	Heart in Systemic diseases And echocardiography	Evaluation of pericardial disease and tamponade.	9
Week 12	11/08/2016	Cases study: congenital heart diseases in adults. Evaluation after surgical correction.	Evaluation of Bicuspid valve evaluation. Coarctation of the aorta.	10
Week 13	11/15/2016	Prosthetic valves Interventional Echocardiography	Evaluation of ASD and VSD. Practice set up lab equipment for TEE.	
Week 14	11/22/2016	Fall recess		
Week 15	11/29/2016	Final exam	Final exam	

Make up exam: 12/06/2016

Syllabus updated: 08/12/2016

Note: Instructor may change this syllabus and course schedule at any time according to the judgment as to what is best for the class. Any changes will be declared ahead of time in class.