LINCOLN UNIVERSITY

DI 255 – Advanced Echo Imaging
Summer 2013 Course Syllabus

DATES: 06/10/2013 – 07/26/2013

COURSE NUMBER: DI 255

COURSE TITLE: ADVANCED ECHO IMAGING

CREDIT: 4 units = 3 units of lectures and 1 unit of laboratories

LECTURES: Mondays 6:30 pm – 9:15 pm

Wednesdays 9:00 am – 11:45 am

LABORATORIES: Wednesdays 12:30 pm – 4:15 pm

INSTRUCTOR: Oxana Ostanina, MD, RDCS

CONTACT INFORMATION: (415) 646-5456

OFFICE HOURS: By appointment, e-mail: ostanina@lincolnuca.edu

RESOURCE OF MATERIALS:

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 review 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 135*

LEARNING OBJECTIVES:

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

- Utilizing two-dimensional echocardiography, identify and assess the abnormal anatomical structures of the heart and great vessels.
- 2D/M-mode – identify abnormal structures displayed on two-dimensional and M-mode within each image.
- 2D and M-mode Measurements – perform two-dimensional and M-mode measurements for each structure and chamber. Perform LV linear measurements and calculations to assess chambers and valves function.
- Identify valve diseases, repaired and prosthetic valves; perform two-dimensional, M-Mode and Doppler measurements to assess severity of the valve pathology.
- Identify pacemakers and intracardiac aid devices and perform measurements to assess cardiac performance.
- Spectral and Color Doppler – identify direction and velocity information given in the color and spectral Doppler images/waveformsin cardiac pathology (valve diseases, cardiomyopathies, pericardial diseases, etc.).
- Doppler Calculations – perform Doppler calculations, i.e., stroke volume, cardiac output and valve areas in cardiac pathology.
- Cardiac Hemodynamics – explain abnormal hemodynamic parameters, including intracardiac pressures; compare data obtained in echo laboratory with cardiac catheterization laboratory.
- Other echocardiographic modalities – Stress echocardiography, Contrast echocardiography, intracardiac ultrasound. Know how to perform stress echocardiographic study and treadmill test; understanding of wall motion abnormalities and the corresponding coronary artery perfusion regions.
- Transesophageal echocardiography – understand standard basic views and role of the sonographer in the performance of the TEE.
- EKG and Auscultation – Explain normal and abnormal heart sounds and their relationship to the cardiac cycle. Identify and interpreter abnormal cardiac rhythms and its effect on cardiac function.
- LA, RA, and RV Function – Explain and describe the echocardiographic measurement parameters that assess LA, RA and RV.
- Evaluation of cardiac pathology – Describe and utilize ASE recommended views

and measurements in the complete normal and abnormal transthoracic echocardiogram.

INSTRUCTIONAL METHODS:

The previously described topics will be presented through the following:

- Assigned text readings and lecture outlines
- Students are recommended to use DropBox to review lectures, case studies and protocols.
- Demonstration of lectures by using Power Point
- Recommended study guide activities
- Internet resources (useful WEB sites are provided)
- Group discussions and ultrasound case analyses
- Quizzes, presentations
- Practicing standard normal TTE protocol and TTE protocols for assessment of cardiac diseases
- Ultrasound laboratory live and video demonstration
- Students' Ultrasound Hands-on self-study trainings

REQUIREMENTS:

- Lecture topics are presented explained and demonstrated by the instructor.
- The student is 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 topic(s) one week ahead of time.
- The student is expected to attend and participate in all course 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.
- The student 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 student 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

Ultrasound hands-on laboratory will involve primarily students' demonstration of the knowledge presented during lectures. Practical experience will gain under the guidance of the instructor. The syllabus set out includes a competency assessment sheet for training. This should be completed the course of training, as it will help to determine in which area(s) the student can practice independently. Students are expected to arrive to class on time, and stay through the end of Ultrasound laboratory class.

ATTENDANCE AND PARTICIPATION:

- Students who are tardy, who arrive after the roll is taken, or leave before the end of class, will receive only half-credit for attendance.
- Student not allowed being late more than 15 min!
- If you are late or absent, a valid excuse such as illness, family emergency, unforeseen heavy traffic or natural disaster is expected. Oversleeping, and working on imaging are not considered valid excuses.
- No requirements to make up any work missed as a result of an absence. However, it is your responsibility to obtain class notes; you may have missed, from other class members.
- Administrative policies on ABSENCES FROM CLASSES are as follows:

  A student receives a WARNING NOTICE after missing 12% of all classes registered in a semester. A student is placed on PROBATION after missing 18% of all classes registered in a semester. A student may be DISMISSED after missing 30% of all classes registered in a semester.

IN-CLASS PRESENTATION (PROJECT):

Each student prepares a power-point presentation on ultrasound vascular diagnostic topic of his/her choice. The presentation should be approximately 10 minutes long, 5 minutes discussion. The topics and format for the presentation will be discussed in class. A final draft of the presentation must be submitted for review one week prior to the presentation. An article related to the presentation for students to review must also be submitted one week prior to the presentation.

Evaluation Criteria for Presentation:

- Clinical statement
- Background information
- Slide content
- Slide design
- Resolution of the problem
- Written presentation

TESTING:

❖ **Quizzes:**

The student will take 6 tests. Each of them consists of 10-15 questions. These quizzes will address the detailed contents 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. No make-up quizzes for missed quizzes will be administered (the student will receive no score for missed quizzes).

❖ **Midterm & Final examination**

- The student will take written midterm of 50 questions and final examination of 100 questions.
- The written examinations are proctored and will be closed-book exams.
- A student must take the exam during the scheduled time period.
- A missed 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. A doctor note or another legitimate document from official facility is required as a proof of absence. In such a circumstance, the student should make every reasonable attempt to contact the instructor before the exam period is over (or as soon as possible).
- While make-up exams will cover the same content area as a missed exam, the exam format and specific questions may be different.

❖ **Ultrasound Hands-on Laboratory Examination:**

- For the final ultrasound hands-on examination student has to demonstrate understanding of information presented during lectures and laboratory practicing.
- Student has to perform echocardiographic protocols and demonstrate scanning technique and images in 2D-, Doppler Modes, and M-mode of normal TTE protocol and TTE protocol of assessment of cardiac pathology.

- Student will schedule time and date 2-3 week ahead to Ultrasound hands-on laboratory examination.
- Student must be in the Ultrasound Lab – ready to start scanning at the exact time you scheduled your exam for. (It is recommended that you arrive about 15 minutes prior to your scheduled exam time.)
- If a student is late for his/ her scheduled exam time – Your time CANNOT be changed and you will NOT get a full hour! If student late, he/she will only have the remaining time left in your hour. On exam days, you may come to class, but it is not mandatory until your scheduled exam time.

GRADING:

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

100-93	A
92-89	A-
88-85	B+
84-81	B
80-77	B-
76-73	C+

72-69	C
68-65	C-
64-61	D+
60-50	D
≤ 49	F

CLASS SCHEDULE:

WEEKS	DATES	TOPICS	TESTS
Week 1	06/10 06/12	Prosthetic Valve and Prosthetic Valve Diseases. Endocarditis. Cardiac masses. Sources of emboli.	Test #1
Week 2	06/17 06/19	Diseases of the Great Vessels (Diseases of the Aorta and Pulmonary Artery. Transesophageal echocardiography. Role of a sonographer. Standard views.	Test #2
Week 3	06/24 06/26	Other echocardiographic modalities. Stress echocardiography. Contrast echocardiography. Systemic and Pulmonary hypertension (methods of evaluation). Compare systemic and pulmonary circulation. Catheterization left and right heart.	Test #3
Week 4	07/01 07/03	Basic Embryology, Congenital heart diseases in adults. Congenital abnormalities of the aortic valve, mitral valve, and the aorta. Pulmonary valve and the pulmonary artery. Right side heart abnormalities. Tricuspid valve abnormality.	Test #4
Week 5	07/08 07/10	**Midterm** Congenital heart diseases in adults. Septal defects. Transposition of great vessels.	Test #5
Week 6	07/15 07/17	Persistence of normal fetal communication. PDA. PFO. Arrhythmias and its effect on cardiac performance.	Test #6
Week 7	07/22 07/25	Final Exam. Presentations. Articles review.	

Syllabus Updated: 05/30/2013

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