



LINCOLN UNIVERSITY

DI 245 – Echo Scanning (Lab)
Spring 2017 Course Syllabus

Credit: 3 units = 3-unit lab (90 hours)
Class Hours: Tuesday & Thursday 6:30 – 9:15 PM
Instructor: Mark Solovey, RDCS
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mania@lincolnuca.edu
Office Hours: by appointment

REQUIRED TEXTBOOK:

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

The Normal Examination and Echocardiographic Measurements, 2nd revised edition, Bonita Anderson, 2007. ISBN-10: 0646468634

Echocardiography pocket guide: The Transthoracic Examination, 1st Edition, Bernard E. Bulwer, Jose M. Rivero, 2010. ISBN-13: 978-0-7637-7935-1 (pbk.); ISBN-10: 0-7637-7935-0 (pbk.) **The Washington Manual of Echocardiography**, 1st Edition, Ravi Rasalingam (Editor), Majesh Makan (Editor), Julio E. Pérez (Editor), 2012.
ISBN-13: 978-1451113402, ISBN-10: 1451113404

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

Pre-Requisite: DI 235

Course Description

Scanning protocols and practices for the ultrasound examination of the heart. (3 units)
The course studies B-mode, M-mode, color Doppler and spectral imaging, which are used for ultrasound evaluations, sonographic appearances and function of the heart.

Learning Objectives

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

- Assist patients to and from the exam area
- Explain the examination and instruct the patient properly
- Describe a scanning survey and explain its importance prior to taking images
- Explain the selection of the proper transducer for the exam
- Explain the elements of film labeling
- Describe optimal techniques related to field size, power, gain, and contrast for image interpretation
- Present films in a logical sequence

- Describe the anatomy, physiology, normal variations, and pathology of myocardium, pericardium and valves.
- Explain the significance of clinical tests relevant to pathology within heart.
- Explain the sonographic findings and differential diagnosis of findings.



Ultrasound Hands-on Laboratory Training

Ultrasound hands-on laboratory training will involve:

- Using the theoretical material presented during lectures as a basis for hands-on training.
- Applying theoretical knowledge to practice.
- Learning to follow proper ultrasound scanning protocols
- Acquiring optimal quality of diagnostic images
- Proper operating of ultrasound machines and maximizing the us machines' capabilities
- Gaining practical experience under the guidance of the lab instructor.

Instructional Methods

- In-class hands-on scanning, using ultrasound machines and other lab equipment
- Live demonstration ultrasound imaging of organs and blood vessels
- The instructor's guidance to developing students' scanning skills.
- Group work, discussions and ultrasound case analysis
- Ultrasound laboratory video demonstrations and presentations

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 consists of a project presented at the end of the course. Each student will choose the topic for presentation or will be assigned one by the instructor. The presentation should be approximately 10 minutes long and with 5 minutes for a discussion. The presentation should include ultrasound images related to the topic of presentation. The images need to be dated and should indicate the student's name. The topic and format for the presentation will be discussed in class for more details. A final draft of the presentation must be submitted for review one week prior to the presentation.

Evaluation Criteria for Project:

- Clinical statement: 2%
 - Background information: 2%
 - Slide content: 2%
 - Slide design: 1%
 - Resolution of the problem: 2%
 - Oral presentation in class: 1%
- 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. If a student takes more than ten quizzes, only the best ten quiz scores will be used in calculating the student's total points. Each quiz will be timed; 1 minute for every question to complete. No make-up quizzes for missed quizzes will be administered (students will receive no score for missed quizzes).

Ultrasound Hands-on Laboratory Examination

During the Hands-On Lab Examination, students should demonstrate:

1. The understanding of the information presented primarily during the lectures and hands-on laboratory training.
2. The knowledge of the anatomy, physiology, normal variations, and pathology of the human body
3. In-depth knowledge of the ultrasound scanning protocols and the ability to present images in a logical sequence.
4. The use of different acoustic windows to achieve the best picture quality possible.
5. The ability to select the proper transducer for the exam
6. The knowledge of the ultrasound machine capabilities for the optimal quality of diagnostic images (frequency, TGC, B-mode, focal zones, color scale, gain, depth, etc).
7. The ability to describe optimal techniques related to field size, power, gain, and contrast for the image interpretation.
8. Knowledge of the elements of the image labeling
9. Explanation of the sonographic findings and differential diagnosis of abdominal pathology
10. Since the intent of the lab examination is for the student to demonstrate the knowledge of the scanning protocol, students are not allowed to ask questions and discuss the scanning procedures with classmates. Reference materials are not allowed.

Midterm and Final Exams

- Midterm and Final Exams will be performed on scheduled days in the presence of the lab instructor.
- The length of the examination will depend on the type of the ultrasound protocol.
- The score (%) will be determined by acquiring the ratio of the correct / incorrect images recorded by the student.
- Depending on the quantity of the required images of the particular protocol, each image will be valued at certain amount of points.
- The points for missed (or completely incorrect) ultrasound images will be subtracted from the total 100% score.

- The added score of the correct ultrasound images (according to the protocol requirements) will represent the total examination grade.

Testing

Ultrasound Hands-on Laboratory Examination:

- Students have to demonstrate understanding of information presented during hands-on laboratory training.
- Students have to perform different ultrasound protocols and demonstrate scanning technique and images in B-mode, M-mode, Color and Spectral Doppler.
- Students required to schedule time and date 2-3 week ahead for Ultrasound hands-on laboratory examination.
- Students need to be at the Ultrasound Lab, ready to start scanning at the exact scheduled time.
- If a student is late for the scheduled exam time, the time **CANNOT** be changed and the student **WILL NOT** get a full hour! The student will only have the remaining time left in the hour.
- Only one time **RETESTS** will be given to students with a valid excuse such as illness, family emergency, unforeseen heavy traffic or natural disaster.

Grading

GRADING FACTORS	%
Scanning Performance: Final Exam	30
Scanning Performance: Midterm Exam	30
Quizzes	10
Attendance	20
Project Presentation	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 245 – Echo Scanning (Lab)
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Weeks	Date	Topics	Quiz
1	01/17/17	General approach to Echo, PLAX	
1	01/19/17	PLAX & PSAX 2D & color	
2	01/24/17	Parasternal window measurement (m-mode)	1
2	01/26/17	Parasternal window measurement (2D) & PSAX Duplex	
3	01/31/17	Apical window 2D (A4C, A5C, A2C, A3C)	2
3	02/02/17	Apical window 2D Duplex	
4	02/07/17	Apical window 2D, Duplex	3
4	02/09/17	Holiday	
5	02/14/17	Parasternal & Apical windows 2D	
5	02/16/17	Parasternal & Apical windows 2D & M-mode	4
6	02/21/17	Parasternal & Apical windows 2D, M-mode, Duplex	
6	02/23/17	Parasternal & Apical windows 2D, M-mode, Duplex	5
7	02/28/17	Parasternal & Apical windows 2D, M-mode, Duplex	
7	03/02/17	MIDTERM EXAM	
8	03/07/17	Subcostal window- long axis 2D & Color	
8	03/09/17	Suprasternal notch window-short & long axis	6
9	03/21/17	Spring Recess	
10	03/21/17	Suprasternal notch window-short & long axis 2D, Duplex	7
10	03/23/17	Review common MV pathology	
11	03/28/17	Full Protocol 2D, M-Mode, Duplex	
11	03/30/17	Review common AV pathology	8
12	04/04/17	Full Protocol 2D, M-Mode, Duplex	
12	04/06/17	Review common myocardial pathology	9
13	04/11/17	Full Protocol 2D, M-Mode, Duplex	
13	04/13/17	Review Diastolic dysfunction	10
14	04/18/17	Full Protocol 2D, M-Mode, Duplex	
14	04/20/17	Full Protocol 2D, M-Mode, Duplex	
15	04/25/17	Full Protocol 2D, M-Mode, Duplex	
15	04/27/17	Full Protocol 2D, M-Mode, Duplex	
16	05/02/17	FINAL EXAM	

Makeup Exam: 05/04/2017

Syllabus updated: December, 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.