

# **LINCOLN UNIVERSITY**

## **DI 125 – Introduction to Echocardiography**

**Dates: 08/28/2013 – 12/12/2013**

**Course Number: DI 125**

**Course Title: Introduction to Echocardiography**

**Credit Hours: 4 units = 3 units of lectures + 1 unit of laboratories**

**Lectures: Wednesday 9:00 am – 11:45 am**

**Laboratories: Thursday 6:30 pm – 9:15 pm (10/03 – 12/12)**

**INSTRUCTOR: Oxana Ostanina, MD, RDCS**

**CONTACT INFORMATION: [ostanina@lincolnuca.edu](mailto:ostanina@lincolnuca.edu)**

**OFFICE HOURS: By arrangement**

### **RESOURCE OF MATERIALS:**

Echocardiography: The Normal Examination and Echocardiographic Measurements, 2nd revised edition, Bonita Anderson, 2007

ISBN-10:**0646468634**, ISBN-13: **978-0646468631**

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:**

This introductory course focuses on normal anatomy, scan techniques, cardiac measurement, and new dynamics. (4 units)

Prerequisite: DI 115

## **LEARNING OBJECTIVES:**

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

- Utilize Two-dimensional echocardiography, identify and assess the normal anatomical structures of the heart and great vessels.
- 2D/M-mode Anatomy – identify basic two-dimensional and M-mode anatomy and the structures contained within each image displayed.
- 2D and M-mode Measurements – perform basic two dimensional and M-mode measurements for each structure. Perform basic LV linear measurements and calculations.
- Spectral and Color Doppler – identify direction of and velocity information given in the color and spectral Doppler images/waveforms.
- Basic Doppler Calculations – perform basic Doppler calculations, i.e., stroke volume, cardiac output and valve areas.
- Cardiac Physiology – explain the electrical and mechanical events within the cardiac cycle.
- Cardiac Hemodynamics – explain normal hemodynamic parameters, including intracardiac pressure and oxygen saturation.
- Basic EKG and Auscultation – describe the normal EKG and commonly encountered abnormal EKG findings. Explain normal and abnormal heart sounds and their relationship to the cardiac cycle.
- Systolic Function – describe basic echocardiographic measurement parameters to assess LV and RV systolic function.
- LA, RA, and RV Function – explain and describe the basic echocardiographic measurement parameters that assess LA, RA and RV normal and abnormal function.
- Normal Examination – describe the ASE recommended views and measurements in the complete normal transthoracic echocardiogram.

## **INSTRUCTIONAL METHODS:**

The lectures and other reading material will be provided in an electronic format. You will find a folder “ECHO” with weekly tasks in theDropBox from Google. Instructions on how to use DropBox will be given during the first class meeting.

- Lectures and assigned reading material

- Internet resources
- Group discussions and ultrasound case analyses

## **REQUIREMENTS:**

### **❖ 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 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 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).

### **❖ Midterm & Final examination:**

- 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.
- 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:**

- In the final ultrasound hands-on examination, students have to demonstrate understanding of information presented primarily 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:**

<b>GRADING</b>		<b>%</b>
<b>LECTURE</b>	Final Exam	20
	Midterm	20
	Tests/Quizzes	10
	Attendance lecture classes	10
	Project	10
<b>LABORATORY</b>	Performing of scanning protocol	20
	Attendance lab classes	10
<b>TOTAL</b>		100

95-100%	A
90-94%	A-
87-89%	B+
84-86%	B
80-83%	B-
76-79%	C+

70-75%	C
66-69%	C-
60-65%	D
≤ 59	F

**SCHEDULE:**

WEEKS	DATE	TOPICS	TESTS
WEEK 1	08/28	CARDIAC ANATOMY AND PHYSIOLOGY REVIEW. IDENTIFICATION OF THE LEFT SIDE HEART STRUCTURES. BASIC TOMOGRAPHIC IMAGING.	
WEEK 2	09/04	CARDIAC ANATOMY AND PHYSIOLOGY REVIEW. IDENTIFICATION OF THE RIGHT SIDE HEART STRUCTURES. BASIC IMAGING PRINCIPLES AND NOMENCLATURE OF STANDARD VIEWS.	
WEEK 3	09/11	CARDIAC CONDUCTION SYSTEM. CARDIAC CYCLE. SYSTOLE AND DIASTOLE. ELECTRICAL AND MECHANICAL CORRELATION. CORONARY CIRCULATION.	
WEEK 4	09/18	IMAGING INSTRUMENTATION. CARDIAC TRANSDUCERS. TRANSTHORACIC TOMOGRAPHIC VIEWS. TWO DIMENSIONAL ECHO VIEWS. PARASTERNAL LONG AXIS VIEW.	
WEEK 5	09/25	TRANSTHORACIC VIEWS. TWO DIMENSIONAL VIEWS. PARASTERNAL SHORT AXIS VIEWS. APICAL VIEWS.	

WEEK 6	10/02	TRANSTHORACIC VIEWS, SUBCOSTAL AND SUPRASERNAL VIEWS. BASIC MEASUREMENTS. MIDTERM REVIEW.	
WEEK 7	10/09	MIDTERM. TRANSTHORACIC IMAGING MODALITIES/ M-MODE OF THE AORTIC ROOT.	
WEEK 8	10/16	TRANSTHORACIC IMAGING MODALITIES. M-MODE OF THE MITRAL VALVE, MEASUREMENTS. M-MODE OF THE PULMONIC VALVE.	
WEEK 9	10/23	TRANSTHORACIC IMAGING. M-MODE OF LEFT VENTRICLE. LEFT VENTRICLE SYSTOLIC FUNCTION.	
WEEK 10	10/30	BASIC CARDIO-VASCULAR PHYSIOLOGY AND HEMODYNAMICS. SYSTEMIC AND PULMONARY CIRCULATION. OXYGEN SATURATION.	
WEEK 11	11/06	BASIC HEMODINAMICS, PRESSURES INSIDE THE HEART.HEART SOUNDS. CATHETERIZATION OF THE LEFT AND RIGHT HEART.	
WEEK 12	11/13	DOPPLER BASICS. SPECTRAL DOPPLER. PULSE WAVE VS. CONTINUOUS WAVE. COMPARISON OF M-MODE AND PRESSURE CURVE. DOPPLER WAVE FORMS. BASIC DOPPLER CALCULATIONS AND FORMULAS.	
WEEK 13	11/20	DOPPLER BASICS. COLOR FLOW DOPPLER PRINCIPLES. NORMAL COOLOR FLOW PATTERNS.	
WEEK 14	12/04	STENOSIS AND REGURGITATION FLOW PATTERNS. REVIEW FINAL EXAMINATION.	
WEEK 15	12/11	FINAL EXAMINATION	

Revised on 8/14/2013