



LINCOLN UNIVERSITY

Spring 2018 Course Syllabus DI 125 – Introduction to Echocardiography

Dates: 01/18/2018 – 5/03/2018

Course Number: DI 125

Course Title: Introduction to Echocardiography

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

Level: Developed (D)

Lectures: Thursdays 3:30pm – 6:15pm

Laboratories: Thursdays 6:30 pm – 9:15 pm

INSTRUCTOR: Mark Solovey, RDCS, RVT

CONTACT INFORMATION: msolovey@lincolnucasf.edu

OFFICE HOURS: By arrangement

RESOURCE OF MATERIALS:

Echocardiography:

The textbook is optional.

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

ISBN-10: 0323227589

ISBN-13: 978-0323227582

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

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 heart anatomy, scanning techniques, modes of echocardiographic examination and cardiac hemodynamics. (4 units)

Prerequisites: DI 110, DI 115

LEARNING OUTCOMES:

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.
- Spectral and Color Doppler – identify direction and velocity information given in the color and spectral Doppler images/waveforms.
- 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:

- Lectures and assigned reading material
- Internet resources

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 10 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, 15 minutes to complete
- Late assignments will be graded with a late penalty
- 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 30 questions and final examination of 50 questions.
- ★ The written examinations are proctored and will be closed-book exams.
- ★ 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.
- ★ The midterm will cover the first half of the lab course. Students are not allowed to use the protocol during the Midterm. Students will have to demonstrate understanding of the imaging views and measurements.
- ★ 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:

LECTURE	%
Final exam	30%
Mid-term	20%
Quizzes/Homework	10%
Attendance of lectures	10%
LABORATORY	
Performing of scanning protocol	20%
Attendance in lab	10%
TOTAL	100%

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

CLASS SCHEDULE:

WEEK 1

01/18

CARDIAC ANATOMY OF OF THE PARASTERNAL VIEWS. ANATOMY AND PHYSIOLOGY OF THE LEFT SIDE HEART STRUCTURES. PHYS REVIEW.

WEEK 2 2

01/25

CARDIAC ANATOMY AND PHYSIOLOGY REVIEW. IDENTIFICATION OF THE RIGHT-SIDE HEART STRUCTURES.

WEEK 33

02/01

CARDIAC CONDUCTION SYSTEM. CONDUCTION CARDIAC SYSTEM. CYCLE. CARDIAC SYSTOLE AND SYSTOLE AND AND ELECTRICAL AND MECHANICAL CORRELATION. CORONARY CIRCULATION.

LAB BEGINS. BEGIN SCANNING PARASTERNAL VIEWS AND COLOR DOPPLER. IMAGE OPTIMISATION

WEEK 44

02/08

IMAGING INSTRUMENTATION. CARDIAC TRANSDUCERS. TWO DIMENSION LECHODIMENSIONAL ECHO LONG AXIS VIEW.

PRACTICE PLAX AND START PSAX. IMAGE OPTIMIZATION AND USE ZOOM ON VALVES. ELECTRICAL AND MECHANICAL EVENTS CORRELATION.

WEEK 5

02/15

TRANSTHORACIC VIEWS. TWO VIEWS. PARASTERNAL SHORT SHORT AXIS VIEWS. APICAL VIEWS. CONTINUE 2D IMAGING BASED ON THE "BEGINNER PROTOCOL". IDENTIFICATION LEFT HEART STRUCTURES.

WEEK 66

02/22

TRANSTHORACIC VIEWS, AND TAL AND SUPRASTERNAL VIEWS. OF THE TRANSTHORACIC IMAGING OF THE AORTIC ROOT. MIDTERM REVIEW. CONTINUE PRACTICING 2D IMAGING PLAX, OF PLAX, PSAX AND START APICAL ACCESS.

WEEK 77

03/01

MIDTERM (LECTURES)

CONTINUE WORKING ON THE IMAGING. PRACTICE PRACTICE
SUBCOSTAL SUBCOSTAL AND AND SSN APPROACH. IDENTIFICATION
RIGHT SIDE STRUCTURES.

WEEK 88

03/08

DOPPLER BASICS. SPECTRAL DOPPLER. PULSE WAVEVS.
CONTINUOUS WAVE.
COMPARISON OF M-MODE AND PRESSURE CURVE.
DOPPLER WAVEFORMS.
PRACTICE THE SEQUENCE OF THE IMAGES AND OPTIMIZATION.

WEEK 9

03/22

BASICHEMODYNAMICS, PRESSURES INSIDE THE HEART. HEART
SOUNDS.
PRACTICE THE SEQUENCE OF THE IMAGES AND OPTIMIZATION.

WEEK 10

03/29

CATHETERIZATION OF THE LEFT AND RIGHT HEART.
PRACTICE THE SEQUENCE OF THE IMAGES AND OPTIMIZATION.

WEEK 11

04/05

DOPPLER BASICS. COLOR FLOW DOPPLER PRINCIPLES. NORMAL
COOLOR FLOW PATTERNS.
PRACTICE THE SEQUENCE OF THE IMAGES AND OPTIMIZATION.

WEEK 12

04/12

STENOSIS AND REGURGITATION FLOW PATTERNS. REVIEW FINAL
EXAMINATION. PRACTICE THE SEQUENCE OF THE IMAGES
AND OPTIMIZATION.

WEEK 1313

04/19

TRANSTHORACIC IMAGING MODALITIES. M-MODE OF THE
AORTIC ROOT.
LAB FINAL

WEEK 1414

04/26

TRANSTHORACIC IMAGING MODALITIES. M-MODE OF THE MITRAL VALVE. M-MODE OF THE PULMONIC VALVE.

WEEK 1515

05/03

FINAL EXAMINATION (LECTURE)

Syllabus Revised on 01/12/2018 (the syllabus is subject to change at any time)

Appendix. Program and Institutional Learning Outcomes.

Institutional Learning Outcomes (ILOs)	
<i>Graduates of the BS program of Lincoln University should be able to:</i>	
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)	
<i>Students graduating our BS in Diagnostic Imaging program will be able to:</i>	
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