LINCOLN UNIVERSITY
DI 265 – Echo Scanning (Lab)
Fall 2019 Course Syllabus

Instructor:	Dr. Khatia Mania / Mr. Delbert Davis
Schedule:	Monday & Wednesday 6:30 pm – 9:15 pm
Credits:	3 units / 90 lab hours
Pre-requisites:	*DI 255*
Level:	Advanced (A)
Office Hours:	By appointment **E-mail: ddavis@lincolnuca.edu**
Reading Assignment:	Attached
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.
Date of Revision:	August 2019

CATALOG DESCRIPTION

Students will learn advanced echocardiograph procedures. Topics include stress echo, related diagnostic imaging, and related noninvasive cardiac testing. (3 units)

COURSE DESCRIPTION

Scanning protocols and practices for the ultrasound examination of the heart.

GOALS AND OBJECTIVES FOR ULTRASOUND ADULT HEART IMAGING

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

1. Utilize the principles of instrumentation to set up the ultrasound equipment for scanning
2. Identify normal and abnormal anatomy of the adult heart
3. Perform a standard Echo protocol
4. Apply appropriate measurements scanning techniques: 2-D, Color Doppler, Spectral Doppler, CW, PW, Pedoff probe, M-Mode
5. Obtain knowledge and be familiar with most common modern Echocardiography field development and procedures (Stain, 3D echo, ICE/Cardiac Oblation, TEE, Cardio-version, MV clip, TAVR procedure, Heart Transplant, etc.)
6. Determine the cardiac hemodynamic and detect the presence of pathology
7. Perform an oral or written summary of preliminary findings to the interpreting physician.

COURSE LEARNING OUTCOMES[1]

	Course Learning Outcome	Program LO	Institutional LO	Assessment activities
1	Identify abnormalities of resting cardiac wall motion and thickening using standard terminology; classify each according to its clinical significance.	PLO 4 PLO 5	ILO 6a	Lab activities
2	Identify and differentiate ventricular hypertrophy by chamber, type, and degree. Identify, stratify, and discuss the clinical significance of pericardial effusion in the assessment of suspected tamponade. Demonstrate the technique to image the posteromedial apical fossa and LA appendage to inspect for thrombus.	PLO 3 PLO 6	ILO 6a, ILO 7a	Lab activities
3	Document and measure the course of blood flow through the entire heart using color and spectral Doppler. Correct operator errors to maximize system sensitivity of color/spectral Doppler to avoid the most common false negative findings.	PLO 4 PLO7	ILO 6a	Lab activities, quizzes, midterm and final exams
4	Based on clinical findings, select, describe the basis for, and execute the appropriate Doppler calculation for a given pathological state, including (expanded vs. simplified Bernoulli equation for AS; peak/mean pressure gradient; continuity equation; pressure half time for mitral stenosis or aortic insufficiency; Color Doppler of mitral valve orifice area; pulmonary acceleration time; subjective and objective methods of grading insufficiency in all four valves; E/A ratio, pulmonary vein reversal, tissue Doppler, and MV deceleration time).	PLO 5 PLO 7	ILO 6a	Lab activities, quizzes, midterm and final exams

STUDENT RESPONSIBILITIES

Students are expected to be prepared in advance before the class sessions. Being prepared includes the following: don't use cell phones in class, be on time to class, participate in scanning lab, ask questions, memorize protocols, bring appropriate materials to class (e.g. notebook, writing utensils, handouts) having read texted materials (e.g. textbooks lectures & outlines), collect images for review, retrieve instructors signature to sign off organs & small-parts protocols, use class time effectively and efficiently, and PRACTICE, PRACTICE, more PRACTICE scanning during lab hours and self lab hours.

SCANNING LAB RULES

Lab hours: Based on the Lab schedule

Lab hours are posted front door & bulletin board (please respect class time, do not enter when class time is in session)

Each student has a maximum time of 35-45 min. (times may vary according to instructor or # of students waiting)

[1] Detailed description of learning outcomes and information about the assessment procedure are available at the Center for Teaching and Learning website (ctl.lincolnuca.edu).

Timer is used to track accurate time

Use student subjection envelope for questions or concerns

Sign in on preferred machine (see clipboards) (with your name, start time & finish time) (after finish must resign in if you want to continue to scan)

Respect Others and Lab:

No eating or drinking in lab (only water)

No cell phones (exit room if must use phone)

Clean up after yourself (table, transducer, putting chairs away, moving equipment, trash etc.)

Inform instructor or staff of needed supplies or equipment broken

Keep a low tone of voice (lab room is small, speaking loudly can be very disrupting to student(s) who need their concentration for scanning

Don't interrupt student scanning time (ask the student is it okay to asked them questions while their scanning)

Lecture scanning (ask questions at appropriate time only ask instructor not other students)

Personal property (never leave your personal property unattended, Lincoln University is not responsible for lost or stolen items. Although, Lincoln University does have a zero tolerance for theft, any student(s) caught stealing will be prosecuted)

Please don't remove any objects from lab room (books, study materials)

Leave personal conversation outside lab room

Outside patients (please inform your outside patients to only bring 1 person with them, due to lab size, and number of students present)

No children allowed unless being scanned

Machines (Acuson/Sequoia; Philips/iE22; and GE):

Please kindly shut down the machine after scanning class

Do not erase any information on machines (only instructors or lab assistants)

Please inform lab assistants of needed supplies (baby wipes, paper towels, gel)

Wipe down transducer after every patient using the Transeptic spray)

Change paper after every patient, and place pillow under paper not on top

Please be very careful when moving around equipment (ultrasound machines, patient tables)

IN-CLASS PRESENTATION

Students are to perform library research on a current topic in the field of Echocardiography and present their findings orally in a PowerPoint presentation (10 minute presentation; 5 minute question period). Students should include enough background information, ultrasound images, pictures and references for their peers to be able to understand the topic. The topic of each presentation will be chosen by the students with the approval of the teacher. Approvals must be obtained by April 2nd, 2018. Presentation dates will be assigned on a first come, first served basis. You may do so in class, during office hours, by phone, or by E-mail. Student presentations

will be performed in the lab class on April 23rd, 2018. An oral presentation must be completed **AT LEAST ONE WEEK BEFORE your FINAL HANDS-ON ULTRASOUND LAB EXAMINATION** (see schedule below). In-class presentation will account for 10 percent of your final grade.

Evaluation Criteria for Presentation:

Clinical statement

Background information

Slide content

Slide design

Resolution of the problem

Oral presentation

Confident knowledge of the presented topic

Ability to answer question of the presented topic

HANDS-ON LAB EXAM

Each student will be assigned a partner and time;

Each partner will have his/her turn to perform parts of the Physical Exam covering any of the material taught during semester;

ECHO protocol and all modalities will be demonstrated and trained students during semester;

Student performs ECHO protocol independently from lab instructor

Student have to conduct and demonstrate finished ultrasound protocols with required to sonograms qualities: proper using transducers, scanning modes (B-scan, Color- , Power-, and Spectral Doppler), Color mapping, accurate measurements of anatomical structures, and proper labels on the images if needed

Student have to submit final Performance of scanning all required by course ECHO protocol throughout of the semester;

Student have to conduct **full Standard protocol** in final lab exam:

Final exam dates is scheduled in the syllabus (see schedule below).

Student must pass the final exam with **AN AVERAGE OF 70% (grade "C-") OR BETTER OR YOU WILL FAIL THE ENTIRE COURSE AND WILL NEED TO TAKE LAB CLASS AGAIN.**

GRADING

Attendance	10%
Presentation	10%
Performance (quizzes and tests)	40%
Final exam	40%
Total	100%

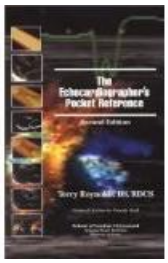
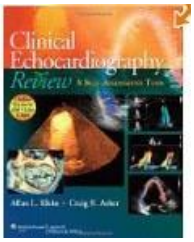
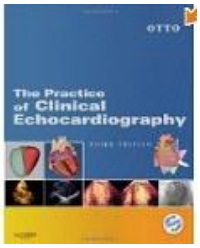
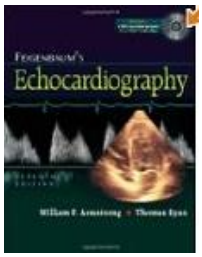
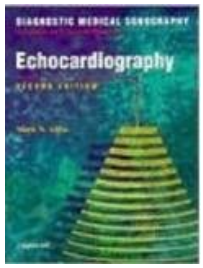
All activities will be graded according to the points as shown below.

Grade	A	A-	B+	B	B-	C+	C	C-	D+	D	F
Points	94-100	90-93	87-89	84-86	81-83	78-80	76-77	74-75	72-73	70-71	0-69

SCHEDULE Fall 2019: DI 245 – Echo Scanning (Lab)

WEEKS		DATES	ULTRASOUND HANDS-ON SCANNINGS
1	M	**Aug 19**	Review anatomical structures, normal measurements and ECHO protocol
	W	**Aug 21**	**Normal measurements of the heart structures (Quiz)**
2	M	**Aug 26**	Diastology of the normal adult heart
	W	**Aug 28**	Abnormal diastolic function
3	W	**Sep 4**	Evaluation of abnormal LV diastolic function
	M	**Sep 9**	**Diastology: written and hands on test**
4	W	**Sep 11**	LV systolic function and geometry (measurements and evaluation)
	M	**Sep 16**	Simpson method, dP/dT, LV mass index, Strain
5	W	**Sep 18**	**LV systolic function written quiz**
	M	**Sep 23**	**LV systolic FXN and geometry hands-on test**
6	W	**Sep 25**	Evaluation of the left and right heart (measurements)
	M	**Sep 30**	Pulmonary hypertension evaluation
7	W	**Oct 2**	**Pulmonary hypertension written quiz and hands on test**
	M	**Oct 7**	Stenosis (AS, MS)
8	W	**Oct 9**	Stenosis (TS, and PS)
	M	**Oct 14**	Regurgitations (MR, TR, PI, and AI)
9	W	**Oct 16**	**Valve disease written test. Midterm examination**
	M	**Oct 21**	Cardiomyopathy
10	W	**Oct 23**	Pericardial diseases
	M	**Oct 28**	**Cardiomyopathy written quiz**
11	W	**Oct 30**	Hypertensive heart (Systemic/Pulmonic)
	M	**Nov 4**	SE Indication, type, and reading Echo Stress Test (treadmill, bike, dobutamine)
12	W	**Nov 6**	**Stress Echo/CAD – written and hands-on test**
	W	**Nov 13**	Echo protocol Review
13	M	**Nov 18**	Congenital diseases
	W	**Nov 20**	**Presentations (common intervention procedures)**
14	M	**Nov 25**	ICE, TEE indication and application
15	M	**Dec 2**	Preparation for the final exam
	W	**Dec 4**	Final Exam

READING ASSIGNMENT

		The Echocardiographer's Pocket Reference, Second Edition [Spiral-bound] (July 2000) Terry Reynolds (Author), Pamela Kidd (Author) Approximate price $120
		Clinical Echocardiography Review: A Self-Assessment Tool By Allan L. Klein and Craig R. Asher (Mar 28, 2011) Approximate price $118-$120
		Practice of Clinical Echocardiography: Text with DVD-ROM, 3e By Catherine M. Otto (Nov 26, 2007) Approximate price $200-$100
		Feigenbaum's Echocardiography By William F. Armstrong and Thomas Ryan (Dec 16, 2009) Approximate price $140-$120
		Echocardiographer's Pocket Reference, 3rd edition By Terry Reynolds (Jan 1, 2008) Approximate price $120
		Echocardiography By Mark Allen, Diane M. Kawamura, Marveen Craig and Mimi C. Berman (Jan 15, 1999) Approximate price $70-$30
	ECHOpedia	http://www.echopedia.org