



# **LINCOLN UNIVERSITY**

## **DI 265 – Echo Scanning (Lab)**

### **Spring 2018 Course Syllabus**

**DATES: 01/16/2018 – 05/08/2018**

**COURSE TITLE:** Echo Scanning (Lab)

**COURSE CODE:** DI 265

**LEVEL:** Advanced (A)

**CREDIT HOURS:** 3 units (90 lab hours)

**TIME:** Monday 6:30 pm – 9:15 pm; Tuesdays 6:30 pm – 9:15 pm

**LAB INSTRUCTOR:** Diana Wagle, RDCS

**CONTACT INFORMATION:** email: di.turrell.lu@gmail.com

**COURSE DESCRIPTION:** Scanning protocols and practices for the ultrasound examination of the heart.

**COURSE PRE-REQUISITE:** DI 235 – Echo Imaging

**READING ASSIGNMENT:** Attached

#### **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 Ablation, TEE, Cardioversion, MV clip, TAVR procedure, Heart Transplant, etc.)
5. Determine the cardiac hemodynamic and detect the presence of pathology
6. Perform an oral or written summary of preliminary findings to the interpreting physician

## **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)**

**Timer is used to track accurate time**

**Use student submission 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 (babywipes, 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 23<sup>rd</sup>, 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:**

<b>Attendance</b>	5%
<b>Presentation</b>	10%
<b>Performance (quizzes and tests)</b>	40%
<b>Final exam</b>	45%
<b>Total</b>	100%

100-91	A
90	A-
89-85	B+
84-81	B
80	B-
79-75	C+

74-71	C
70	C-
69-65	D+
64-60	D
<b>60 ≤</b>	<b>F</b>

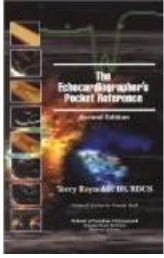
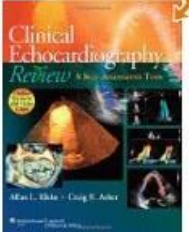
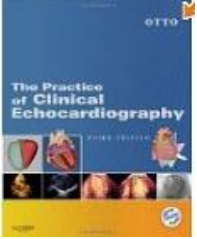
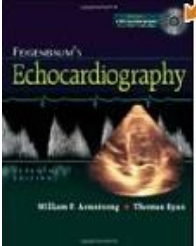
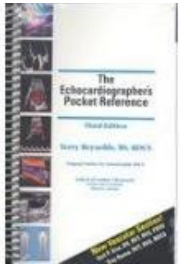
**SCHEDULE SPRING 2018: DI 245 – Echo Scanning (Lab)**

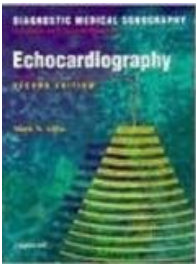
WEEKS		DATES	ULTRASOUND HANDS-ON SCANNINGS
1	M	Jan.15	No class
	T	Jan.16	Review anatomical structures, normal measurements and ECHO
2	M	Jan.22	<b>Normal measurements of the heart structures (Quiz)</b>
	T	Jan.23	Diastology of the normal adult heart
3	M	Jan.29	Abnormal diastolic function
	T	Jan.30	Evaluation of abnormal LV diastolic function
4	M	Feb.5	<b>Diastology: written and hands on test</b>
	T	Feb. 6	LV systolic function and geometry (measurements and evaluation)
5	M	Feb.12	Simpson method, dP/dT, LV mass index, Strain
	T	Feb. 13	<b>LV systolic function written quiz</b>
6	M	Feb. 19	<b>LV systolic FXN and geometry hands-on test</b>
	T	Feb. 20	Evaluation of the left and right heart (measurements)
7	M	Feb. 26	Pulmonary hypertension evaluation
	T	Feb. 27	<b>Pulmonary hypertension written quiz and hands on test</b>
8	M	March 5	Stenosis (AS, MS)
	T	March 6	Stenosis (TS, and PS)
9	M	March 12	Regurgitations (MR, TR, PI, and AI)
	T	March 13	<b>No class</b> Spring Recess
10	M	March 19	<b>Valve disease written test</b>
	T	March 20	<b>Valve disease hands-on test</b>
11	M	March 26	Cardiomyopathy
	T	March 27	Pericardial diseases
12	M	Apr. 2	<b>Cardiomyopathy written quiz</b>
	T	Apr. 3	Hypertensive heart (Systemic/Pulmonic)
13	M	Apr. 9	SE Indication, type, and reading Echo Stress Test (treadmill, bike,
	T	Apr. 10	<b>Stress Echo/CAD – written and hands-on test</b>
14	M	Apr.16	Echo protocol Review
15	T	Apr. 17	Congenital diseases
	M	Apr.23	<b>Presentations (common intervention procedures)</b>
16	T	Apr. 24	ICE, TEE indication and application
	M	Apr.30	Preparation for the final exam
17	T	May 1	Final Exam
	M	May 7	Make up class

The syllabus updated 12/31/2017

**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.

**READING ASSIGNMENT:**

		<p>The Echocardiographer's Pocket Reference, Second Edition [Spiral-bound] (July 2000)</p> <p>Terry Reynolds (Author), Pamela Kidd (Author)</p> <p>Approximate price \$120</p>
		<p><a href="#">Clinical Echocardiography Review: A Self-Assessment Tool</a></p> <p>By Allan L. Klein and Craig R. Asher (Mar 28, 2011)</p> <p>Approximate price \$118-\$120</p>
		<p><a href="#">Practice of Clinical Echocardiography: Text with DVD-ROM, 3e</a></p> <p>By Catherine M. Otto (Nov 26, 2007)</p> <p>Approximate price \$200-\$100</p>
		<p><a href="#">Feigenbaum's Echocardiography</a></p> <p>By William F. Armstrong and Thomas Ryan (Dec 16, 2009)</p> <p>Approximate price \$140-\$120</p>
		<p><a href="#">Echocardiographer's Pocket Reference, 3rd edition</a></p> <p>By Terry Reynolds (Jan 1, 2008)</p> <p>Approximate price \$120</p>

		<p><a href="#">Echocardiography</a></p> <p>By Mark Allen, Diane M. Kawamura, Marveen Craig and Mimi C. Berman (Jan 15, 1999)</p> <p>Approximate price \$70-\$30</p>
	ECHOpedia	<a href="http://www.echopedia.org">http://www.echopedia.org</a>

## Appendix A. Program and Institution Learning Outcomes:

### Institutional Learning Outcomes (ILOs)

*Graduates of the BS program of Lincoln University should be able to:*

<b>1a</b>	Develop the habits and skills necessary for processing information based on intellectual commitment, and using these skills to guide behavior.
<b>2a</b>	Raise important questions and problems, and formulate them clearly and precisely in oral or written communication
<b>3a</b>	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.
<b>4a</b>	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.
<b>5a</b>	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
<b>6a</b>	Show creativity by thinking of new and better goals, ideas, and solutions to problems; to be resourceful problem solvers.
<b>7a</b>	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)

*Students graduating our BS in Diagnostic Imaging program will be able to:*

<b>1</b>	Demonstrate ability of accurate patient positioning techniques, and use of imaging technology
<b>2</b>	Adapt imaging procedures based on patient's needs and clinical limitations.
<b>3</b>	Practice effective oral and written communication skills in the clinical setting

## APPENDIX B: CLASSIFICATION OF LU CURRICULUM COURSES:

Code	Classification	Description
<b>Courses &lt; 10, and 300A/300B</b>	Review (R)	Review courses are supplemental courses that are not a part of any program.
<b>Courses 10 - 99</b>	Introductory (I)	Introductory undergraduate courses are designed to acquaint students with foundational concepts, ideas, and competences in a specific field of study as well as general education disciplines. General Education courses provide a background in the liberal arts and expose students to the fundamental aspects of human culture. They also

		help students to develop analytical and communication skills and foundation for advanced work in the major field of study.
<b>Courses 100 - 199</b>	Developed (D)	Developed undergraduate courses build upon the concepts, ideas, and competences introduced in the Introductory level; expanding students' understanding of the specific field of study.
<b>Courses 200 - 286</b>	<b>Advanced (A)</b>	<b>Advanced courses in undergraduate programs are intended to bring students' comprehensive knowledge of concepts, ideas, and skills in the specific field of study to the highest level within the baccalaureate programs.</b>
<b>Courses 288 - 299</b>	Bachelor Assessment (BA)	Bachelor Assessment courses are structured to provide opportunity to assess students' achievements of set program learning outcomes.
<b>Courses 300 level w/o graduate prerequisites</b>	Mastery 1 (M1)	Mastery 1 courses introduce graduate level concepts and ideas in a specific field of study and provide an opportunity to initiate the development of graduate level competences.
<b>Courses 300 level with graduate prerequisites</b>	Mastery 2 (M2)	Mastery 2 courses build upon students' execution of Mastery 1 learning outcomes and allow for further development of students' mastery of concepts, ideas, and competences in the specific field of study.
<b>Courses 398, 399</b>	Mastery 2 / Assessment (M2A)	Mastery 2/Assessment courses are structured to provide opportunity to assess students' achievements of set program learning outcomes.
<b>Courses 400 level</b>	Mastery 2 / Research (M2R)	Mastery 2/Research courses employ individual research project to deepen students' understanding of the subject developed in lower level courses and to equip students with knowledge and skills required by MS and DBA degree programs.
<b>Courses 500 level</b>	Doctorate Assessment (DA)	Doctoral Assessment courses are doctorate level seminars and research activities fostering the highest level of professional expertise by providing continuous assessment and development of students' ideas and analytical skills in the context of the doctorate program.