



# **LINCOLN UNIVERSITY**

## **DI 145 – Echo Scanning (Lab)**

### **Summer 2013 Course Syllabus**

**DATES: 06/10/2013 – 07/26/2013**

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

**COURSE CODE: DI 145**

**CREDIT HOURS: 3 units**

**TIME: Tuesdays, Wednesdays, Thursdays, Fridays; 5:30 pm – 9:15 pm**

**LAB INSTRUCTOR: Diana Wagle, RDCS/AE (ARDMS)**

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

**COURSE DESCRIPTION:**

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

Students will learn and master their scanning skills of echocardiographic procedures. Topics include basic knowledge of Echo protocol, stress echo, related diagnostic imaging, and related noninvasive cardiac testing.

**COURSE PREREQUISITE: DI 135**

**READING ASSIGNMENT: Attached (page 5 of this syllabus)**

**GOALS AND OBJECTIVES FOR ULTRASOUND ADULT HEART IMAGING:**

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

- ✓ Utilize the principles of instrumentation to set up the ultrasound equipment for scanning
- ✓ Perform a standard ECHO protocol
- ✓ Apply appropriate measurements and scanning techniques: 2-D, Color Doppler, Spectral Doppler, CW, PW, Pedoff probe, M-Mode
- ✓ Determine the cardiac hemodynamic and detect the presence of basic pathology
- ✓ Obtain knowledge of Stress Echo Test, Contrast Echo and Bubble Study

**STUDENT RESPONSIBILITIES:**

Students are expected to be prepared in advance before the class sessions. Being prepared includes the following: wear uniform (Lincoln logo scrubs), don't use cell phones in class, attend all classes, be on time to class, participate in scanning lab, ask questions, memorize protocols, bring appropriate materials to class (e.g. notebook, writing utensils, handouts) have reading materials (e.g. textbooks lectures & outlines), collect images/studies for review, use class time effectively and efficiently, and PRACTICE, PRACTICE, more PRACTICE scanning during lab hours and self lab hours. The harder you work in the school lab the easier it will be in the real one.

## **SCANNING LAB RULES:**

### **Lab hours:**

- ✓ **Lab hours are posted front door & bulletin board** (please respect class time, do not disturb when class time is in session)
- ✓ **Each student has a maximum time of 45-60min. (times may vary according to instructor or the number of students participating in the lab. class)**
- ✓ **Timer could be used to track accurate time**
- ✓ **Use student suggestion envelope/box for questions or concerns**

### **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, put away chairs & other 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 students' 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 is the only machine that has Echo application and used for Echo lab class):**

- ✓ 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 safely move around equipment (ultrasound machines, patient tables)

## **IN-CLASS SCANNING**

Students are to perform Echo scanning protocol, which would be graded by the instructor based on quality of images, correct measurements, and order of the views, logic and common sense of the order. All scanning must be completed and graded **AT LEAST A WEEK BEFORE your FINAL HANDS-ON ULTRASOUND LAB EXAMINATION** (see schedule below). In-class scanning will account for 20 percent of your final grade.

**Evaluation Criteria for Scanning:**

- ✓ Completion of the demographic information
- ✓ Knowing the Echo Protocol
- ✓ Order of Echo Views
- ✓ Quality of the images
- ✓ Proper measurements of the heart structures
- ✓ Ability to differentiate and recognize structures of the heart on US images.
- ✓ Ability to evaluate pathology if any
- ✓ Creativity in obtaining the images
- ✓ Ability to answer question instructor might have about particular study.

**GRADING SCALE**

**HANDS-ON LAB EXAM:**

- Each student will be assigned 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 will perform ECHO protocol independently from lab instructor;
- Students have to conduct and demonstrate finished ultrasound protocols with required sonograms qualities: proper use of transducers, scanning modes (B-scan, Color-, Power-, and Spectral Doppler), accurate measurements of anatomical structures, and proper image labels if needed;
- Students have to submit final performance of scanning all required by course ECHO protocol throughout the semester;
- Students have to conduct **full standard protocol** in final lab exam;
- Final exam dates are scheduled in the syllabus (see schedule below);
- Students must pass the final exam with **AN AVERAGE OF 72-69% (grade “C”) OR BETTER OR YOU WILL FAIL THE ENTIRE COURSE AND WILL NEED TO TAKE LAB CLASS AGAIN.**

**GRADING:**

<b>Attendance</b>	10%
<b>Scanning, quizzes, project, homework</b>	20%
<b>Performance of scanning protocols (hands-on skills)</b>	20%
<b>Final exam</b>	50%
<b>Total</b>	100%

100-91	A
90-89	A-
88-86	B+
85-81	B
80-79	B-
78-76	C+

75-71	C
70-69	C-
68-66	D+
65-51	D
<b>50≤</b>	<b>F</b>

**SCHEDULE: Summer 2013****DI 145 — Echo Scanning (Lab)**

DATES		ULTRASOUND HANDS-ON SCANNINGS
T	11 JUN	Review anatomical structures of the heart in ECHO views
W	12 JUN	Review ECHO protocol
TH	13 JUN	Diastology of the normal adult heart(review)
F	14 JUN	Diastology of the normal adult heart (normal measurements)
T	18 JUN	Pathology of diastolic function of the heart
W	19 JUN	Review measurements of all normal heart structures
TH	20 JUN	Systolic function, Volumes, Ejection Fraction
F	21 JUN	Simpson method, dP/dT, and LV mass index
T	25 JUN	Left Ventricular Hypertrophy (grades and estimation)
W	26 JUN	Left ventricle wall motion evaluation, coronary artery segments
TH	27 JUN	Regurgitations (MR, TR, PI, and AI)
F	28 JUN	Stenosis (AS, MS, TS, and PS)
T	2 JUL	Stress Echo (purpose, evaluation, conclusion)
W	3 JUL	Cardiomyopathy
TH	4 JUL	<b><i>Independency Day (no class)</i></b>
F	5 JUL	Hypertensive heart (Systemic)
T	9 JUL	Pericardial diseases
W	10 JUL	Valve pathologies (obtained and congenital)
TH	11 JUL	Presentations, Homework
F	12 JUL	Presentations, Homework
T	16 JUL	Evaluation of the left side of the heart
W	17 JUL	Evaluation of the right side of the heart
TH	18 JUL	Prediction of the intracardiac pressure
F	19 JUL	Prosthetic Valves (types, normal PG and blood flow velocity)
T	23 JUL	Segments of the heart walls
W	24 JUL	Review ECHO protocol
TH	25 JUL	Preparation for final exam
F	26 JUL	<b>Final hands-on examination</b>

The syllabus updated 06/19/2013

**Note:** Instructor may change this syllabus and course schedule at any time according to the circumstance of the class and overall students' performance. Any changes will be declared ahead of time in class.

**READING ASSIGNMENT:**

1.		<p>The Echocardiographer's Pocket Reference, Second Edition [Spiral-bound]</p> <p>By Terry Reynolds and Pamela Kidd (July 2000)</p> <p>ISBN-10: <b>0963576798</b>, ISBN-13: <b>978-0963576798</b> Approximate price \$120</p>
2.		<p>Clinical Echocardiography Review: A Self-Assessment Tool</p> <p>By Allan L. Klein and Craig R. Asher (Mar 28, 2011)</p> <p>ISBN-10: <b>160831054X</b>, ISBN-13: <b>978-1608310548</b> Approximate price \$118-\$120</p>
3.		<p>Practice of Clinical Echocardiography: Text with DVD-ROM, 3e</p> <p>By Catherine M. Otto (Nov 26, 2007)</p> <p>ISBN-10: <b>1416036407</b>, ISBN-13: <b>978-1416036401</b> Approximate price \$200-\$100</p>
4.		<p>Feigenbaum's Echocardiography</p> <p>By William F. Armstrong and Thomas Ryan (Dec 16, 2009)</p> <p>ISBN-10: <b>0781795575</b>, ISBN-13: <b>978-0781795579</b> Approximate price \$140-\$120</p>
5.		<p>Echocardiographer's Pocket Reference, 3rd edition</p> <p>By Terry Reynolds (Jan 1, 2008)</p> <p>ISBN-10: <b>001405101X</b>, ISBN-13: <b>978-0014051014</b> Approximate price \$120</p>
6.		<p>Echocardiography</p> <p>By Mark Allen, Diane M. Kawamura, Marveen Craig and Mimi C. Berman (Jan 15, 1999)</p> <p>ISBN-10: <b>0397552629</b>, ISBN-13: <b>978-0397552627</b> Approximate price \$70-\$30</p>