LINCOLN UNIVERSITY

DI 114 – Vascular Anatomy and Hemodynamics

Fall 2014 Course Syllabus

DATES: 08/28/2014 – 12/11/2014

COURSE TITLE: Vascular Anatomy and Hemodynamics

COURSE CODE: DI 114

CREDIT HOURS: 3 units, 45 lecture hours

TIME: Thursday 3:30 pm – 6:15 pm

INSTRUCTOR: Marina Kay, RDMS, RVT

CONTACT INFORMATION: email: kaymarina@yahoo.com or mkay@lincolnuca.edu

COURSE DESCRIPTION:
This course provides the knowledge of gross anatomy of the central, peripheral and cerebrovascular systems, principles of the dynamics of blood circulation in the human body, the factors that influence blood flow, and hemodynamic consequences of occlusive disease.

COURSE PREREQUISITE: DI 110

READING ASSIGNMENT:
Introduction to Vascular Ultrasonography. William J. Zwiebel, John S. Pellerito. 5th Edition.
ISBN-10: **0721606318**; ISBN-13: **978-0721606316**

SUGGESTED TEXTBOOKS:
Ultrasound Physics and Instrumentation. Frank R. Miele. 4th edition. Volume II
ISBN-10: **1933250070**; ISBN-13: **978-1933250076**

Vascular Ultrasound: How, Why and When. Abigail Thrush, Tim Hartshorne. 3rd Edition.
ISBN-10: **0443069182**; ISBN-13: **978-0443069185**

COURSE OBJECTIVES:

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

- Demonstrate the basic understanding of the normal physiology and physical principles of the blood circulation
- Describe the anatomy, physiology and normal variations of central and peripheral arterial and venous systems
- Understand the use of color Doppler and pulsed wave Doppler in the process of vascular evaluation
- Be able to perform the Doppler waveform analysis
- Describe standard measurements for duplex vascular evaluation
- Recognize abnormalities that can occur in the presence of vascular obstruction
- Differentiate normal from abnormal blood flow patterns
- Know the different diagnostic criteria for peripheral arterial disease
- Apply the diagnostic criteria and link Doppler image information to the manifestations of cerebrovascular disease
- Understand normal venous physiology by the evaluation of Doppler imaging
- Recognize the significance of venous pathophysiology by the use of ultrasound imaging
- Apply the diagnostic criteria to determine the extent of venous insufficiency
- Determine the presence of thrombosis in deep and superficial venous systems

CLASSROOM PROTOCOL:

- All students are expected to display professionalism in preparation for hospital work. That means: arriving on time, remaining quiet when others are speaking, and paying attention to whoever has the floor in the classroom.
- Students are expected to attend and be prepared for all regularly scheduled classes.
- If a student knows in advance that he or she will need to leave early, the student should notify the instructor before the class period begins.
- Students are expected to treat faculty and fellow students with respect.
- Students engaging in disruptive behavior in class will be asked to leave and may be subject to other penalties if the behavior continues.
- No eating, sleeping or personal grooming is permitted in the classroom.
- ***Drinks are allowed only in closed containers.***
- The cell phones should be turned off.
- If you use a computer in class, please use it only to take notes, to access course materials from the course webpage, or to locate information relevant to the class discussion. Do not use your computer to surf the web, check emails, or send/receive text messages, as these activities are distracting to those around you (and decrease your chances of getting the most out of your time in class).
- Never leave your personal property unattended. Lincoln University is not responsible for lost or stolen items, though Lincoln University does have a zero tolerance for theft; any students caught stealing will be prosecuted.

STUDENT RESPONSIBILITIES:

Students are expected to be prepared in advance before the class sessions. Being prepared includes the following: no cell phones in class, attending all classes, being on time for classes, participating in the class activities, asking questions, bringing appropriate materials to classes (e.g. notebook, writing utensils, handouts), having read texted materials (e.g. textbooks, lectures & outlines), using class time effectively and efficiently.

INSTRUCTIONAL METHODS:

The topics will be presented through the aid of the following activities:

- Assigned text readings and lecture outlines (handouts);
- Demonstration of lectures by using the Power Point;
- Recommended study guide activities;
- Internet resources;
- Group discussions and ultrasound case analyses;
- Quizzes & examinations;
- Students' in-class presentations and discussions.

GRADING:

Attendance	10%
Homework	10%
Presentations	10%
Quizzes and Tests	20%
Mid-term Exam	25%
Final Exam	25%
Total	100%

100-95	A
94-90	A-
89-87	B+
86-84	B
83-81	B-
80-78	C+

77-76	C
75-74	C-
73-72	D+
71-70	D
69≤	F

LECTURES SCHEDULE:

Dates	Lectures	Topics	Quiz
28-Aug	Lecture 1	Human Circulatory System. Systemic and Pulmonary Blood Circulation	
4-Sep	Lecture 2	Gross Anatomy of the Central and Peripheral Arterial System	1
11-Sep	Lecture 3 Part I	Physiology and Hemodynamics of the Arterial System. Types of Pressures. Blood Flow Characteristics	2
18-Sep	Lecture 3 Part II	Physical Principles of Fluid Dynamics. Poiseuille's Law, Bernoulli Equation, Reynolds Number	3a
25-Sep	Lecture 4	Arterial Doppler Waveform Analysis. Steady and Pulsatile Flow. Peripheral Resistance. Effects of Stenosis and Exercise on the Arterial Flow	3b
2-Oct	Lecture 5 Part I	Gross Anatomy of the Extracranial and Intracranial Cerebrovascular System	4
9-Oct	Lecture 5 Part II	Physiology and Hemodynamics of the Cerebrovascular System. Spectral and Color Doppler Analysis	5a
16-Oct		Midterm Exam	
23-Oct	Lecture 6 Part I	Anatomy of the Peripheral Venous System.	5b
30-Oct	Lecture 6 Part II	Peripheral Venous System. Muscle Pump Mechanism. Venous Valvular Function	6a
6-Nov	Lecture 7	Hemodynamics of the Peripheral Venous System. Effect of Respiration on Venous Pressure. Spectral and Color Doppler Analysis	6b
13-Nov	Lecture 8 Part I	Abdominal Venous System Anatomy and Hemodynamics. Portal Venous System	7
20-Nov	Lecture 8 Part II	Abdominal Venous System B-scan, Spectral and Color Doppler Analysis	8a
27-Nov		Fall Recess	
4-Dec		Review and Presentations	8b
11-Dec		Final Exam Make-Ups	

The syllabus updated: 07/19/2014
Note: Instructor may change this syllabus and course schedule at any time according to the needs of the class.