



LINCOLN UNIVERSITY

DI 234 – Abdominal Vascular

Course Syllabus

Spring 2022

Instructor: Dr. Olesya Smolyarchuk
Lecture Schedule: Fridays, 9:00 AM – 11:45 AM
Lab Schedule: Fridays, 12:30 PM – 3:15 PM (02/18 – 04/29/2022)
Credits: 4 units: 3-unit lecture and 1-unit lab
(75 total hours: 45 hours of lectures and 30 hours of lab)
Level: Advanced (A)
Office Hours: By appointment
E-mail: osmolyarchuk@lincolnuca.edu

Textbooks: Diagnostic Medical Sonography. The Vascular System. By Ann Maie Kupinski, 2013
ISBN 978-1-60831-350-1

Introduction to Vascular Ultrasonography. Zwiebel. Pellerito. 6th Edition (2012).
ISBN-13: 978-1437714173, ISBN-10: 143771417X

Additional recommended textbooks and instructional materials will be given during classes.

Prerequisites: *DI 124*
Last Revision: December 29th, 2021

COURSE DESCRIPTION

Ultrasound technologies including B-mode, Color, Power and Spectral imaging are used for studying visceral organs. *Prerequisite: DI 140*

LEARNING OBJECTIVES

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

- Explain the examination and instruct the patient properly
- Describe a scanning survey and explain its importance prior to taking images
- The correct identification of abdominal vessels and the accurate assessment of blood flow in the abdomen
- Describe optimal sonographic techniques for abdominal vascular interpretation.

- Present images in a logical sequence
- Describe the anatomy, physiology, normal variations, and pathology of the abdominal vascular system
- Recognize normal/abnormal imaging, spectral Doppler and color Doppler findings seen with abdominal organs disease
- Explain the significance of clinical tests relevant to pathology within the abdomen
- Recognize ultrasound findings associated with aortic endograft leaks
- Explain the methods of endovascular intervention and postsurgical sonographic appearance of the abdominal blood vessels

COURSE LEARNING OUTCOMES¹

	Course LO	Program LO	Institutional LO	Assessment Activities
1	Recognize the relationship between acoustic principles, hemodynamics, and the sonographic representation of major abdominal vessels and blood flow	PLO 1	ILO 1a, ILO 2a, ILO 3a	In-class activities, quizzes, midterm and final exams, lab activities.
2	Identify the ultrasound findings of abnormal examination of abdominal vessels	PLO 2	ILO 1a, ILO 4a	In-class lab activities.
3	Describe the capabilities and limitations of Doppler ultrasound in assessment of vascular disease	PLO 3	ILO 1a	In-class activities, quizzes, midterm and final exams, lab activities
4	Perform basic scanning of the vascular system of abdomen	PLO 2	ILO 1a	In-class activities, quizzes, midterm and final exams, lab activities

INSTRUCTIONAL METHODS

Instructional methods include lectures and in-class hands-on scanning. Classroom activities are collaborative students may and should help each other. The instructor will be available to help students with all tutorials and other assignments. The previously described topics will be presented through the following activities:

- Assigned text reading;
- Lecture materials;
- Recommended study guide activities;
- Internet resources;
- Group discussions and ultrasound case analysis;
- Quizzes & examinations;
- SIMTICS platform

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

- SonoSim training platform
- Practice using ultrasound machines;
- Hands-on ultrasound laboratory protocols;
- Ultrasound laboratory live & video demonstrations;
- Students' Ultrasound Hands-on self-study.

Assignments and projects require students to actively use resources of the library. Detailed guide to business *resources of the library* as well as the description of Lincoln University approach to *information literacy* are available at the [Center for Teaching and Learning](http://ctl.lincolnuca.edu) website (ctl.lincolnuca.edu).

REQUIREMENTS

- This is a lecture-lab course in which lecture topics are presented by the lecturer and the ultrasound hands-on lab practice is explained and demonstrated by the lab instructor.
- The student is expected to be prepared in advance of the class sessions.
- Preparation includes the following: having read text materials (e.g., textbook readings, and lecture outlines) assigned for that day's activities and bringing required work materials (e.g., textbook, handouts, writing supplies, etc.) to the session.
- Homework includes reading topic prior to the class.
- The student is expected to attend and participate in all course lectures and activities, and complete all quizzes, examinations, and course assignments on time. Therefore, attendance and being on time are crucial for final grade. The student must budget time efficiently and be realistic about all personal and professional commitments that consume time.

ACADEMIC HONESTY

The University maintains a strict policy concerning academic dishonesty, which includes cheating, plagiarism, giving assistance on an examination or paper when expressly forbidden by the instructor, and any other practices which demonstrate a lack of academic integrity. It is the responsibility of the student to know and to adhere to principles of academic honesty. A student found guilty of academic dishonesty will be subject to academic sanctions ranging from assignment failure to course failure.

ULTRASOUND HANDS-ON LABORATORY TRAINING

Ultrasound hands-on laboratory training is primarily focused on providing students with the physical execution of the information presented during the lectures. Practical experience will gain under the guidance of the laboratory instructor. Students are expected to arrive to class on time and stay through the end of Ultrasound laboratory class.

ATTENDANCE AND PARTICIPATION

To successfully complete this course, the student must pass the quizzes, homework, and final exam portions with a 70% or better. Students should attend all the class meetings (lectures and labs). However, considering possible urgent situations, students may be absent from maximum four class meetings with prior notice to the instructor. Three late arrivals will affect the grade.

- **Students who are tardy, who arrive after roll is taken will consider absent.**
- **Students are not allowed to be more than 5 minutes late.**
- **If you are late or absent, a valid excuse such as illness, family emergency, unforeseen heavy traffic or natural disaster is expected.**

- **If you are late because of unforeseen heavy traffic more than 3 times during the semester it will consider as absence.**
- **If a student arrives twice late for a one session (at the beginning of the class and after break more than 5 minutes late) would consider as absent.**

The term grade is based on attendance, class activity, projects, midterm and/or sum of quizzes, final examination, and lab. Individual projects will be assigned at the beginning of the semester.

Homework and project are due by the last meeting before the final examination. No project or homework will be accepted after the due date.

If student misses a class without a valid reason, no make-up for quizzes and presentations is allowed. With valid document, a student is allowed to take missed tests within one week. The valid document must be provided as soon as possible after the student returns from the illness and as determined by the instructor. There is no make up for missed or failed midterm. The final examination, if failed, can be retaken only once. If failed second time, the subject is considered failed. The course is considered failed if student fails Lab final examination. Dictionaries can be used during the class time. No electronic devices during the test time.

Exams must be taken during the scheduled time. 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. In such a circumstance, the student should make every reasonable attempt to contact the instructor before the exam period is over (or as soon as possible). While make-up exams will cover the same content area as a missed exam, the exam format and specific questions may be different.

During the exam, any student observed in a situation that could be considered suspicious (e.g., an open book or notebook within his/her field of vision, looking around or checking a cell phone, or other wireless devices, helping the examinee-sonographer to take images by guiding manually or verbally, etc.) but no cheating is observed, will be warned. Once warned, any applicant found cheating on the exam will be failed for the exam and prohibited from retaking the exam without permission from the dean.

Student cannot leave the room during the test/exam. As soon as student leaves, the exam is considered finished.

Lecture is not a substitute for textbooks. Students should read textbooks and use other sources to be prepared for the tests. Lecture is to guide the student for preparation to subject.

IN-CLASS PRESENTATION (PROJECT)

Each student can choose the topic for presentation or will be assigned one by the instructor. The presentation should be approximately 10 minutes long, 5 minutes discussion. The topics and format for the presentation will be discussed in class. A final draft of the presentation must be submitted for review one week prior to the presentation.

Evaluation Criteria for Presentation:

- Clinical statement 2%
- Background information 2%
- Slide content 2%
- Slide design 1%

- Resolution of the problem 2%
- Oral presentation 1%

TESTING:

Ultrasound Hands-on Laboratory Examination:

- Final ultrasound hands-on examination – students have to demonstrate understanding of information presented during lectures and hands-on laboratory training.
- Students have to perform different ultrasound protocols and demonstrate scanning technique and images in B-mode, M-mode, Color and Spectral Doppler.
- Student is required to schedule time and date 2-3 week ahead for Ultrasound hands-on laboratory examination.
- Students need to be at the Ultrasound Lab, ready to start scanning at the exact scheduled time. (It is recommended that the student arrive about 15 minutes prior to the scheduled exam time.)
- If a student is late for the scheduled exam time, the time CANNOT be changed, and the student will NOT get a full hour! The student will only have the remaining time left in the hour.
- Only one-time **RETESTS** will be given to students with a valid excuse such as illness, family emergency, unforeseen heavy traffic, or natural disaster.

GRADING

Evaluation		Weighting
Lecture	Attendance	10%
	Tests/Quizzes	10%
	Presentation	10%
	Midterm	20%
	Final exam	20%
Laboratory	Attendance	10%
	Scanning Performance	20%
Total		100%

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

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, he or she should notify the instructor before the class period begins.
- Students are expected to treat faculty and fellow students with respect. For example, students must not disrupt class by leaving and reentering during class, must not distract class by making noise, and must be attentive to comments being made by the instructor and by peers.
- Never speak while the instructor is speaking.
- **Disruptive behavior will not be tolerated**
- 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 during lecture and ultrasound laboratory classes.**
- **Drinks only in closed container.**
- Please turn off your cell phones.
- 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).
- To encourage the free flow of conversation, no part of any class may be recorded on audio or video media without the permission of the instructor. You may record notes by hand or by typing into a mobile computer.
- **THE PRESENCE OF GUESTS TO LISTEN TO ANY PART OF A CLASS REQUIRES A CONSENT OF THE INSTRUCTOR.**

LECTURE SCHEDULE

WEEKS	LECTURE #	DATES	TOPICS	QUIZ
WEEK 1	1	01/28	ANATOMY AND DOPPLER SIGNATURES OF ABDOMINAL VESSELS	
WEEK 2	2	02/04	ULTRASOUND ASSESSMENT OF THE AORTA, ILIAC VESSELS, AND THE INFERIOR VENA CAVA	1
WEEK 3	3	02/11	ULTRASOUND ASSESSMENT FOLLOWING ENDOVASCULAR AORTIC ANEURYSM REPAIR	2
WEEK 4	4	02/18	ULTRASOUND ASSESSMENT OF MESENTERIC ARTERIES	3
WEEK 5	5	02/25	ULTRASOUND ASSESSMENT OF HEPATIC VASCULATURE	4
WEEK 6	6	03/04	LIVER HYPERTENSION, CIRRHOSIS, SONOGRAPHIC ASSESSMENT	5
WEEK 7	7	03/11	ULTRASOUND ASSESSMENT OF NATIVE RENAL VESSELS AND RENAL ALLOGRAFTS	6
WEEK 8		03/25	MIDTERM	
WEEK 9	8	04/01	ACUTE ABDOMEN, ULTRASOUND VASCULAR EXAM IMPLICATION.	7
WEEK 10	9	04/08	FEMALE PELVIS VASCULARIZATION, OVARIAN TORSION	8
WEEK 11	10	04/15	MALE PELVIS VASCULARIZATION, TESTICULAR TORSION	9
WEEK 12	11	04/22	HEMODIALYSIS, ACCESS GRAFTS and FISTULAE	10
WEEK 13	12	04/29	MISCELLANOUS ABDOMINAL VASCULAR CONDITIONS	
WEEK 14	13	05/06	FINAL EXAM	
WEEK 15		05/13	PRESENTATION	

LAB SCHEDULE

Week #	Dates	Topics:
Week 1	02/18	Abdominal Vascular Protocols, Ergonomics
Week 2	02/25	Aorta and Branches, Anatomy and Pathology IVC and Tributaries, Anatomy and Pathology
Week 3	03/04	Mesenteric Arteries, Anatomy and Pathology.
Week 4	03/11	Hepatic Vascular Landmarks and Relationships.
Week 5	03/25	Midterm Exam.
Week 6	04/01	Renal Vascular System, Scanning principles.
Week 7-8	04/08-04/15	Portal, Venous System, Anatomy and Pathology
Week 8-9	04/22 04/29	Tumor Vascularity. Final Exam.

Note: Instructor may change this syllabus and course schedule any time according to the judgment as to what is best for the class. Any changes will be declared ahead of time in class.

Lab Grading Requirements:

***Scanning to performance:** Effective use of lab time, development of scanning skills, applying techniques, effective use of ultrasound machine (s) controls, IE: TGC, Depth PRF, Freq. Transducers to improve images on each patient. No Cell Phones Allowed.

***Attendance:** Being punctual, participation and working during class time. Absents, late arrivals, non-use of class times, early leaves will reflect student(s) lower and or failing grade.

***Mid Term, Final:** Exams will focus on protocol, annotations, quality of images, demonstrating proper use of the ultrasound machines in control adjustments to obtain the best body images, basic knowledge of anatomy. The length of the examination will depend on the type of the ultrasound protocol and must be completed within allowed time. The score (%) will be determined by calculating the ratio of the correct / incorrect images acquired and recorded by the student. Depending on the quantity, each image of the protocol will be valued at certain number of points. The points for missed (or completely incorrect) ultrasound images will be subtracted from the total 100% score. The added score of the correct ultrasound images (according to the protocol requirements) will represent the total examination grade. Non-completion, poor behavior, disruption, requiring assistants or dishonesty will result in failing exam and course. To successfully complete this exam, the student must pass it with a total score 70% or better.