



LINCOLN UNIVERSITY

DI 234 – Abdominal Vascular

Course Syllabus

Fall 2025

- Instructor:** Dr. Guillermo Paredes, MD, RDMS (ABD, OB/GYN), RVT
- Lecture Schedule:** Thursday, 12:30 PM – 3:15 PM Lecture
Thursday, 9:00 AM – 11:45 AM Lab (9/4/2025 – 11/06/2025)
- 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: gparedes@lincolnuca.edu
- Textbooks:** 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.
(For Lab)
Textbook of Diagnostic Sonography: Vol. 1, Sandra L. Hagen-Ansert, 7th Edition (2011).
ISBN-13: 978-0323073011, ISBN-10: 0323073018
- Prerequisites:** *DI 124*
- Last Revision:** August 22, 2025

COURSE DESCRIPTION

Ultrasound technologies including B-mode, Color, Power and Spectral imaging are used for studying visceral organs. (4 units)

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 films 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.
- Practice using ultrasound machines.
- Hands-on ultrasound laboratory protocols.
- Ultrasound laboratories live & video demonstrations.

¹ Detailed description of learning outcomes and information about the assessment procedure are available at the [Learning Outcomes Assessment](#) section of LU website.

- 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 [LU Library](http://lincolnuca.libguides.com) website (lincolnuca.libguides.com).

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 for 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 topics 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 be gained under the guidance of the laboratory instructor. Students are expected to arrive at 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 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.

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 at 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 documents, a student is allowed to take missed tests within one week. There is no make up for missed or failed midterm. The final examination, if failed, can be

retaken only once. Dictionaries can be used during class time. No electronic devices during the test time.

Exams must be taken during the scheduled time period. 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 circumstances, 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 written exam, any student observed in a situation that could be considered suspicious (e.g., an open book within his/her field of vision, looking around or checking a cell phone or other wireless device, etc.) but no cheating is observed will be warned. Once warned, any applicant found cheating on written exam will be failed for the exam and prohibited from retaking the written exam without permission from the dean.

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

Lectures are 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
- Background information
- Slide content
- Slide design
- Resolution of the problem
- Oral presentation

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 techniques and images in B-mode, M-mode, Color and Spectral Doppler.
- Students required to schedule time and date 2-3 weeks 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 students 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 containers.
- 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 THE CONSENT OF THE INSTRUCTOR.

LECTURE SCHEDULE: Thursday, 9:00 AM – 11:45 AM (Dr. Guillermo Paredes)

**** Thursday, November 27th 2025 = Thanksgiving**

WEEKS	LECTURE #	DATES	TOPICS	QUIZ
Week 1	1	8/28	ANATOMY AND DOPPLER SIGNATURES OF ABDOMINAL VESSELS	
Week 2	2	9/4	ULTRASOUND ASSESSMENT OF THE AORTA, ILIAC VESSELS, AND THE INFERIOR VENA CAVA	
Week 3	3	9/11	ULTRASOUND ASSESSMENT FOLLOWING ENDOVASCULAR AORTIC ANEURYSM REPAIR	
Week 4	4	9/18	ULTRASOUND ASSESSMENT OF MESENTERIC ARTERIES	1
Week 5	5	9/25	ULTRASOUND ASSESSMENT OF HEPATIC VASCULATURE	
Week 6	6	10/2	LIVER HYPERTENSION, CIRRHOSIS, SONOGRAPHIC ASSESSMENT	
Week 7	7	10/9	ULTRASOUND ASSESSMENT OF NATIVE RENAL VESSELS AND RENAL ALLOGRAFTS	
Week 8	8	10/16	MIDTERM WRITTEN EXAM	
Week 9	9	10/23	ACUTE ABDOMEN, ULTRASOUND VASCULAR EXAM IMPLICATION.	
Week 10	10	10/30	MALE PELVIS VASCULARIZATION, TESTICULAR TORSION	
Week 11	11	11/6	FEMALE PELVIS VASCULARIZATION, OVARIAN TORSION	2
Week 12	12	11/13	MISCELLANEOUS ABDOMINAL VASCULAR CONDITIONS	
Week 13	13	11/20	Course Review for Final Exam	
Week 14	14	12/4	Final exam	
Week 15	15	12/11	Presentation Clinical application for Abdominal Vascular Ultrasound	

LAB SCHEDULE

Week #	Dates	Topics:
Week 1	9/4	Abdominal Vascular Protocols, Ergonomics
Week 2	9/11	Aorta and Branches, Anatomy and Pathology
Week 3	9/18	Mesenteric Arteries, Anatomy and Pathology
Week 4	9/25	Hepatic Vascular Landmarks and Relationships
Week 5	10/2	Portal, Venous System, Anatomy and Pathology
Week 6	10/9	IVC and Tributaries, Anatomy and Pathology
Week 7	10/16	Renal Vascular System, Scanning principles
Week 8	10/23	IVC and Tributaries, Anatomy and Pathology
Week 9	10/30	Diagnostic Criteria for Renal Vascularity evaluation.
Week 10	11/6	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. Students will scan the liver, internal body parts to protocol and body parts will be available for lab discussion in weeks listed above.

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, participating 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 to body images, quality of images, demonstrating proper use of the ultrasound machines in control adjustments to obtain the best body images, basic knowledge of anatomy. Exams, protocol to images must be completed within allowed time. Non-completion, poor behavior, disruption, requiring assistants or dishonesty will result in failing exams and course.