



LINCOLN UNIVERSITY

DI 261 – Advanced Abdomen and Small Parts Scanning (Lab)

Course Syllabus

Spring 2025

Instructor: Dr. Olesya Smolyarchuk
Lecture Schedule: Tuesday 9:00 AM – 11:45 AM, Wednesday 12:30 PM – 3:15 PM.
Credits: 3 units (90 lab hours)
Pre-requisites: *DI 251*
Level: Advanced (A)
Office Hours: Tuesday by appointment
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TEXTBOOKS:

Textbook of Diagnostic Sonography Sandra L. Hagen-Ansert, Eight Edition
ISBN-10: 0323028039

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

Last Revision: January 2025

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

CATALOG DESCRIPTION

This course is the completion of courses on anatomy and pathology of the abdominal and superficial structures in ultrasound imaging. Areas include: thyroid, parathyroid, breast, neck, gastrointestinal tract, lymphatic system. (3 units)

COURSE OBJECTIVES

Upon completion, students should be able to:

- Demonstrate knowledge and understanding of the anatomy, physiology and normal variations of the abdomen, abdominal vascular systems, and small parts.
- Understand and expand the routine ultrasound protocols and presenting sonographic images in a logical sequence.
- Describe the proper scanning technique and commonly used sonographic acoustic windows.
- Utilize the principles of instrumentation to set up the ultrasound equipment for acquiring optimal quality of diagnostic images.
- Demonstrate an increased knowledge of the applications of the ultrasound Doppler.
- Be familiar with the standard measurements and diagnostic criteria for duplex evaluation of the abdomen.
- Recognize sonographic signs of abdominal pathological findings.
- Correlate sonographic and laboratory data.

Recognize and be able to compensate for common pitfalls in the diagnosis of abdominal and small parts pathologies.

COURSE LEARNING OUTCOMES¹

	Course Learning Outcome	Program LO	Institutional LO	Assessment activities
1	Employ proper hands-on techniques to master and expand the routine ultrasound protocols.	PLO 5	ILO 1a ILO 3a	In-class hands-on scanning; laboratory live & video demonstrations; self-study scanning training; midterm/final exams.
2	Utilize the principles of instrumentation, related to field size, TGC, focal zones, color scale, gain, depth, etc. for image interpretation.	PLO 4 PLO 5	ILO 1a, ILO 7a	In-class hands-on scanning; laboratory live & video demonstrations
3	Recognize sonographic signs of vascular pathological findings and differential diagnosis.	PLO 5	ILO 6a	Ultrasound case analysis and group discussions; quizzes

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

4	Explain the significance of clinical tests relevant to pathology. Correlate sonographic and laboratory data.	PLO 3 PLO 4 PLO 7	ILO 6a ILO 7a	Case studies; presentations and discussions of students' projects.
5	Demonstrate knowledge of diagnostic criteria for duplex evaluation of the vascular system.	PLO 5 PLO 7	ILO 7a	Case studies and group discussions.

INSTRUCTIONAL METHODS

Instructional methods will include:

- In-class hands-on scanning, using ultrasound machines and other lab equipment
- Live demonstration of abdominal and small parts ultrasound imaging
- The instructor's guidance to developing students' scanning skills.
- Students' ultrasound hands-on self-study training: **20 lab hours minimum** of independent scanning throughout the semester
- Group work, discussions, and ultrasound case analysis
- Ultrasound lab video demonstrations
- SIMTICS platform
- SonoSim training platform
- Presentations and discussions of students' projects.

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).

Homework:

The goal of the homework is to help students achieve the course learning objectives. Homework consists of two parts. The first part is to read the textbooks, previous course lectures and printed materials to review the topic and be ready for the class. The second part of the homework consists of a project presented at the end of the course.

Project Presentation:

Each student will perform library research on a selected topic in the field of Abdominal organs Scanning and present the findings along with their own images during a lab class orally, using Power Point.

A 10-minute presentation will be followed by a 5-minute question period.

Students should include enough background information, ultrasound images received during classes and their description, images, and references, for their peers to be able to understand the topic.

Each student will choose the topic of his/her presentation with the instructor's approval.

Evaluation Criteria for Presentation:

- Clinical statement: 2%
- Background information: 2%
- Slide content: 2%

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- Slide design: 1%
- Resolution of the problem: 2%
- Oral presentation: 1%

Total: 10% of all the course grading elements

Hands-On Lab Examination:

During the final ultrasound hands-on examination, students have to demonstrate the understanding of the information presented during the course laboratory training.

1. The knowledge of the anatomy, physiology, terminology, normal variations, and pathology of the human abdomen and small parts with vascular system.
2. In-depth knowledge of the ultrasound scanning protocols and the ability to present images in a logical sequence.
3. The knowledge of the ultrasound machine capabilities for the optimal quality of diagnostic images (frequency, TGC, B-mode, focal zones, color scale, gain, depth, etc.).
4. Ability to demonstrate the optimal scanning technique and proper images acquisition in B-, Color-Modes, and M-mode.
5. The utilization of different acoustic windows to achieve the best picture quality possible.
6. The knowledge of the elements of the proper image labeling.
7. The explanation of the sonographic findings and differential diagnosis of abdominal and small parts pathology.

Since the intent of the lab examination is for students to demonstrate the knowledge of the scanning protocol, students are not allowed to ask questions and discuss the scanning procedures with classmates.

Reference materials are not allowed.

ASSESSMENT ACTIVITIES RELATED TO COURSE LEARNING OUTCOMES

Students' scanning techniques, speed, and accuracy will be evaluated daily during scanning in the lab. Their knowledge of abdominal pathology and small parts pathology, terminology, and syndromes will be examined and assessed orally during the lab classes.

SCANNING LAB RULES

Audio and video recordings are prohibited without consent of an instructor and present students.

Lab Hours:

Lab hours are posted on the front door. Please respect class time, try not to enter when a class is in session, or be quiet if you come late.

Use student submission envelope for questions or concerns.

Sign in on the preferred machine with your name, start time and finish time. You must re-sign in if you want to continue to scan after you finish it. Ask a lab assistant.

Respect Others and Lab:

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- **No eating or drinking in the lab.**
- **No cell phones** (exit the room if must use phone).
- **No perfume or scented lotions**
- **No long nails**
- **Clean up after yourself** (table, transducer, put away chairs and other equipment, trash, etc.).
- **Inform instructor or staff of needed supplies or equipment broken.**
- **Keep a low tone of voice.** The lab is small; speaking loudly can be very disruptive to students who need their concentration on scanning.
- **Do not interrupt students' scanning time.** Ask the students whether it is okay to ask them questions while they are scanning.
- Never leave your **personal property** unattended. Although Lincoln University does have a zero tolerance for theft, the university is not responsible for lost or stolen items. Any students caught stealing will be prosecuted.
- **Please do not remove any objects from the lab** (books and study materials).
- **Leave personal conversation outside the lab.**
- **Outside patients:** reconcile with instructor or Lab assistant.
- **No children are allowed in the lab.**

Machines (Acuson, Phillips, and GE):

- Please kindly shut down the machine after the scanning class and check cords, **they should not be on the floor.**
- Do not erase any information on machines (only instructors and lab assistants may do).
- Please inform lab assistants of needed supplies (baby wipes, paper towels, gel).
- **Wipe down the transducer and cords** after every patient, using the antiseptic spray/wipes.
- Change paper after every patient, and place pillow under paper, not on top.
- Please safely move around the equipment (ultrasound machines, chairs, and patient tables).

Attendance and Participation:

- **Students are not allowed to be more than 5 minutes late at the beginning of the class or after break, who arrive after roll is taken will not allowed to stay in the class.**
- If you are late or absent, a valid excuse such as illness, family emergency, or natural disaster is expected.
- If you are late because of unforeseen heavy traffic more than 1 time during the semester it will consider as absence.
- No requirements to make up any work missed as a result of an absence. However, it is your responsibility to obtain notes from other class members regarding the class session you missed.
- Instructor may dismiss a student from the course after missing 3 consecutive class meetings.

COURSE GUIDELINES:

- To successfully complete this course, the students must pass the midterm and final exam portions with a 70% or better. **Students should attend all the class meetings - labs.**

- The term grade is based on attendance, class activity, project, midterm, and final examination. Individual projects will be assigned at the beginning of the semester. **Project is due by the last meeting. No project will be accepted after the last class.**
- If students have missed a class without a valid reason, no make-up for presentations will be allowed.
- **Midterm cannot be retaken.**
- **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.** No electronic devices during the test time. A student must take the exam 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.**
- Students cannot leave the room during the test/exam. As soon as a student leaves, his/her exam is considered finished.
- Students should read textbooks, review lectures from previous course, and use other sources to be prepared for the exam.

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.

Midterm/Final Exam Grading System

Midterm and Final Exams will be performed on the scheduled days in the presence of the lab instructor.

The length of the examination will depend on the type of the ultrasound protocol. The type of the protocol for the exam will be chosen by the instructor for each student individually.

The score (%) will be determined by acquiring the ratio of the correct / incorrect images recorded by the student.

Depending on the quantity of the required images of the particular protocol, each image will be valued at certain number of points.

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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.

To successfully complete this exam, the student must pass it with a total score 70% or better.

GRADING

All activities will be graded according to the points as shown below.

Grade	A	A-	B+	B	B-	C+	C	C-	D+	D	F
Points	94-100	91-93	87-90	84-86	81-83	78-80	76-77	74-75	72-73	70-71	0-69

The final grade for the course will be given as the total weighted score for all activities according to the percentage shown in the table below.

Activity	Percent
Class Attendance and Participation	10%
Presentation	10%
Scanning Performance: Midterm Exam	40%
Scanning Performance: Final Exam	40%
TOTAL	100%

CLASS TOPICS SCHEDULE

Dates	Topics
Week 1	Aorta. AAA Screening. IVC Pancreas. Various Scanning Techniques and Image Optimization.
Week 2	Importance of Image Optimization for Correct Image Interpretation. Liver. Various Scanning Techniques. Measurements and Diagnostic Criteria
Week 2	Liver. Scanning Techniques. Measurements and Diagnostic Criteria
Week 3	Liver Segments. Vascular Landmarks and Duplex Evaluation of the Portal Venous System
Week 3	Portal Hypertension. Hepatitis and Cirrhosis. Liver Surface Evaluation
Week 4	Gallbladder & Biliary System. Patient Positioning, Approaches and Techniques
Week 4	Gallbladder & Biliary System. Patient Positioning, Approaches and Techniques
Week 5	Spleen. Image Optimization and Alternative Scanning Approaches
Week 5	Retroperitoneum. Kidneys and Adrenal Glands. Various Scanning Techniques and Approaches
Week 6	Kidneys. Renal Pathologies. Case Study.
Week 6	Urinary System. Urinary Bladder Volume Calculation
Week 7	Full Abdominal Protocol
March 12	Spring Recess 03/18-22/2025. Midterm
Week 8	Ultrasound of the Neck. Thyroid and Parathyroid Gland.
Week 8	Thyroid Gland
Week 9	Lymph Nodes. Salivary Glands.
Week 9	Lymph Nodes. Case studies.
Week 10	Abdominal Wall. Abdominal Wall Hernias. Case Studies
Week 10	Breast. Proper Image Annotation. Correlation of Mammographic and Sonographic Findings
Week 11	Sonographic Characteristics of Breast Lesions. Case Studies
Week 11	Prostate Gland Evaluation. Case studies
Week 12	Ultrasound Evaluation of Scrotum.
Week 12	Focused Assessment by Sonography in Trauma F.A.S.T. Exam
Week 13	Gastrointestinal Tract. Appendix.
Week 14	Chest and Lung Ultrasound. Emergency Ultrasound Evaluation for Pneumothorax. Case Studies
May 13	Final Exam
May 14	Presentation