



DMS-522: ULTRASOUND PATHOLOGY I (FORMERLY DMS-122)

Effective Term

Fall 2026

BOT Approval Date

01/15/2026

Discipline

DMS - Diagnostic Medical Sonography

Course Number

522

Course Title

Ultrasound Pathology I (formerly DMS-122)

Short Title

Ultrasound Pathology I

Credit Status (CB 04)

D - Credit - Degree applicable

Units**Lecture Units**

3.00

Total Units

3.00

Hours**Lecture Contact Hours**

48-54

Out of Class Hours Lecture

96-108

Total Contact Hours

48 - 54

Total Out of Class Hours

96 - 108

Total Student Learning Hours

144 - 162

Distance Education

No

Catalog Description

This course explores the pathophysiology and sonographic evaluation of abdominal and superficial structures, emphasizing clinical integration and multimodality imaging comparison. Students will examine normal anatomy, common disorders, laboratory correlations, and relevant clinical history for the liver, gallbladder, pancreas, spleen, kidneys, adrenal glands, gastrointestinal tract, breast, thyroid, parathyroid, scrotum, and prostate. Through detailed analysis of sonographic appearance and Doppler flow characteristics, learners will distinguish normal from abnormal findings and correlate them with CT, MRI, mammography, nuclear medicine, and radiographic imaging. Case-based instruction fosters diagnostic reasoning, documentation accuracy, and patient-centered care. (formerly DMS-122)



Requisites

Prerequisite(s)

Prerequisite(s) (must be taken before)

DMS-500 (with a grade of C or better) or Diagnostic Medical Sonography Program graduate certificate/degree or Registered Technologist through ARDMS/CCI/ARRT.

Codes

TOP Code (CB 03)

1227.00* - *Diagnostic Medical Sonography

CIP Code

51.0910 - Diagnostic Medical Sonography/Sonographer and Ultrasound Technician.

Repeatability Code

No

Grading Option

Letter grade OR P/NP

Minimum Qualifications

Minimum Qualifications	And/Or
Diagnostic Medical Technology	End

Learning Objectives

Learning Objectives

Learning Objective

1. Differentiate between the normal liver appearance and the appearance of a cirrhotic liver.
2. Analyze the difference between a cystic lesion and a solid lesion.
3. Evaluate hydronephrosis and describe the different etiologies that cause hydronephrosis.
4. Discover how color flow and pulsed wave doppler characteristics of a pathological process seen on ultrasound will aid in determining a differential diagnosis.
5. Modify imaging techniques and protocols as necessary to improve the imaging process of an observed pathologic finding.
6. Analyze the location of pathology seen on an ultrasound exam and it's relationship to surrounding structures.
7. Interpret the pathophysiology of common disorders affecting abdominal and superficial structures, including their clinical signs, symptoms, and progression
8. Apply cultural competence and awareness of health disparities to the sonographic evaluation of abdominal and superficial structures by adapting communication, imaging techniques, and clinical reasoning to support equitable, patient-centered care across diverse populations.
9. Analyze sonographic pathology and compose accurate reports that reflect ethical standards, professional judgment, and sensitivity to cultural and individual patient differences.

Learning Outcome Information

Course Learning Outcomes

Learning Outcome

1. Students will differentiate the appearance of pathologic conditions as compared to the normal appearance of an abdominal organ using sonographic terminology.
2. Students will analyze pathologic conditions and patient signs and symptoms associated with each organ or exam.
3. Students will compare pertinent patient history and lab values to pathology seen on the ultrasound exam to establish a differential diagnosis.

4. Students will apply culturally competent, patient-centered care principles when interpreting and discussing sonographic findings in diverse clinical scenarios
5. Students will integrate clinical history, lab data, and sonographic findings to support differential diagnosis and patient-centered care
6. Students will apply critical thinking to interpret ultrasound images in the context of pathophysiology and clinical presentation.
7. Students will communicate diagnostic impressions effectively through accurate documentation and written technologist worksheet case presentation.
8. Students will interpret and report sonographic pathology ethically and professionally, with respect for cultural and individual differences.

Content

Course Lecture Content

I. Liver

- A. Normal Anatomy
- B. Disorders
- C. Lab Values
- D. Clinical History
- E. Sonographic Appearance of Related Pathology
- F. Comparison: Sonography vs. CT and MRI
- G. Normal vs. Abnormal Color Flow and Doppler Imaging

II. Gallbladder and Biliary System

- A. Normal Anatomy
- B. Disorders
- C. Lab Values
- D. Clinical History
- E. Sonographic Appearance of Related Pathology
- F. Comparison: Sonography vs. CT and MRI
- G. Normal vs. Abnormal Color Flow and Doppler Findings

III. Pancreas and Retroperitoneal Structures

- A. Normal Anatomy
- B. Disorders
- C. Lab Values
- D. Clinical History
- E. Sonographic Appearance of Related Pathology
- F. Comparison: Sonography vs. CT and MRI
- G. Normal vs. Abnormal Color Flow and Doppler Findings

IV. Spleen

- A. Normal Anatomy
- B. Disorders
- C. Lab Values
- D. Clinical History
- E. Sonographic Appearance of Related Pathology
- F. Comparison: Sonography vs. CT and MRI
- G. Normal vs. Abnormal Color Flow and Doppler Findings

V. Kidneys and Adrenal Glands

- A. Normal Anatomy
- B. Disorders
- C. Lab Values
- D. Clinical History
- E. Sonographic Appearance of Related Pathology

- F. Comparison: Sonography vs. CT and MRI
- G. Normal vs. Abnormal Color Flow and Doppler Findings
- VI. Gastrointestinal System
 - A. Normal Anatomy
 - B. Disorders
 - C. Lab Values
 - D. Clinical History
 - E. Sonographic Appearance of Related Pathology
 - F. Comparison: Sonography vs. CT, MRI, and Plain Film Radiology
 - G. Normal vs. Abnormal Color Flow and Doppler Findings
- VII. Breast
 - A. Normal Anatomy
 - B. Disorders
 - C. Lab Values
 - D. Clinical History
 - E. Sonographic Appearance of Related Pathology
 - F. Comparison: Sonography vs. MRI and Mammography
 - G. Normal vs. Abnormal Color Flow and Doppler Findings
- VIII. Thyroid and Parathyroid
 - A. Normal Anatomy
 - B. Disorders
 - C. Lab Values
 - D. Clinical History
 - E. Sonographic Appearance of Related Pathology
 - F. Comparison: Sonography vs. CT, MRI, and Nuclear Medicine
 - G. Normal vs. Abnormal Color Flow and Doppler Findings
- IX. Scrotum and Prostate
 - A. Normal Anatomy
 - B. Disorders
 - C. Lab Values
 - D. Clinical History
 - E. Sonographic Appearance of Related Pathology
 - F. Comparison: Sonography vs. CT, MRI, and Nuclear Medicine
 - G. Normal vs. Abnormal Color Flow and Doppler Findings
- X. Diversity, Equity, and Inclusion in Sonographic Practice
 - A. Inclusive Patient Communication and Cultural Sensitivity
 - B. Gender-Affirming Imaging Protocols (e.g., breast, scrotum, prostate)
 - C. Trauma-Informed Scanning Techniques Across Body Systems
 - D. Anatomical Variations Across Age, Gender Identity, and Body Type
 - E. Ethical Documentation and Respectful Terminology
 - F. Case Studies Featuring Diverse Populations and Health Disparities
 - G. DEI Considerations in Multimodality Imaging Access and Interpretation

Methods of Instruction

Method

Film/video Viewing and Discussion

Integration

Captioned educational videos will be used by the instructor to demonstrate sonographic appearances of pathology, physiology, or interventional procedures that the student may not be exposed to in the clinical setting. This method will be used to teach students proper identification of unusual pathological findings.

Method

Lecture

Integration

Core content is delivered through instructor-led lectures enhanced by ultrasound images, anatomical diagrams, and clinical case study. Lecture slide show presentations will be used by the instructor to present the clinical indications, lab values, and pathology process of the abdomen, breast, thyroid, and testicular pathologies.

Method

Individual Projects

Integration

Faculty will guide students in the creation and sharing of visual learning tools, such as sketch notes, diagrams, annotated images, and concept maps, that represent key course concepts and complex pathologies. Visual note-taking will be encouraged during lecture sessions, with opportunities for peer exchange to promote collaborative learning and articulation of clinical ideas. Faculty will support format selection and provide formative feedback to ensure clarity, accuracy, and educational value. This creative process fosters individual comprehension, reinforces retention through personalized synthesis, and cultivates a student-generated instructional environment.

Method

Online Activity/Discussion

Integration

Faculty will facilitate a structured online discussion centered on a case study involving a 38-year-old Latina patient with hearing and language barriers. Guided prompts will support analysis of clinical presentation, ultrasound findings, and social determinants of health, while a Learning Diary prompt will encourage individual reflection and self-directed improvement. Peer-to-peer dialogue will emphasize interpreter services, inclusive communication strategies, and ethical responsibilities in sonographic care. This integrated format fosters metacognitive engagement, professional growth, and the application of diversity, equity, and inclusion (DEI) principles in real-world imaging contexts.

Methods of Evaluation**Method**

Quizzes

Integration

Faculty will implement weekly quizzes to monitor and evaluate the student's immediate understanding of concepts in pathology of the abdomen and superficial structures and how it appears on an ultrasound image. Key terminology questions will assess mastery of sonographic vocabulary, while structured multiple-choice questions will target conceptual knowledge of disease processes. Visual learning tools, including diagrams and ultrasound images, will be used to strengthen pattern recognition and diagnostic interpretation skills.

Method

Exams/Tests

Integration

Midterm and Final exams will be used to assess the students ability to retain and process information of pathology conditions; critical thinking skills applied to patient history and symptoms; appearance on an ultrasound image; and differential diagnosis of the abdomen, breast, thyroid, and testicular ultrasound exams to determine the most likely diagnosis.

Method

Class Work

Integration

Students are assessed on the completion of weekly sketchbook entries. These drawings are should include applicable content, creativity, relevance to lecture topics, and participation in group sharing.

Method

Homework

Integration

Students are assessed on the completion of weekly online discussion posts. The instructor will read and reply to weekly posts + one course summary in the CMS discussion "learning diary"; Replies to each student should be made each week. Students receive points for their own post and a reply to a classmate each week. Posts do not have any required length.

Method

Projects

Integration

Student mastery of a selected sonographic concept will be evaluated through a visual presentation project. Evaluation criteria will include clarity of the concept, visual impact, originality, and alignment with relevant anatomical structures or pathological findings. This method emphasizes the student's ability to distill complex material into an educational format that demonstrates understanding and creative synthesis.

Method

Class Participation

Integration

Student understanding of communication barriers and health disparities will be evaluated through participation in a CMS-based case discussion. Comments will be assessed for insight into interpreter services, inclusive communication strategies, advocacy for equitable care, and ethical responsibilities in sonographic practice. Evaluation will emphasize clarity, relevance, and application of DEI principles to clinical imaging scenarios.

Assignments**Assignment Type**

Writing

In-class and/or outside of class

In-class

Outside of class

Formative or Summative

Formative

Assignment

You will take written notes or drawings in your sketchbook during or after each lecture. These notes or sketches are intended to enhance learning by writing you're your "Ah-Ha" moments or the "Lightbulb" moments. , or digital graphics. These "lightbulbs" will be discussed in groups of 2-4 students at the beginning of the next weeks class.

Please watch the video below on sketch noting, before the second class meeting: Sketch noting: <https://www.youtube.com/watch?v=pZgMpjjgCRA&feature=youtu.be>



Supplies: Required textbooks, lap-top or tablet if possible, paper and pen/pencil, colored pencils or markers, one poster board cut into 2 half or quarter, one 8 X 6" artist's sketch pad or similar, or digital graphics- iPad or digital notebook.

Assignment Type

Reading

In-class and/or outside of class

Outside of class

Formative or Summative

Formative

Assignment

Weekly chapter reading assignments:

Objective: To build foundational knowledge in gynecologic and obstetric sonography by engaging with key chapters from the course textbook.

Each week you will complete assigned readings that align with the current area of study. Topics will include:

Gynecology: Anatomy, pathology, and scanning techniques

Obstetrics: First, second, and third trimester imaging protocols and fetal development

Role of Ultrasound in OB Care: Clinical applications, safety, and diagnostic value

Expectations: Read assigned chapters before each class session; Be prepared to discuss key concepts, terminology, and clinical relevance

Complete any accompanying quizzes, worksheets, or reflection prompts

Assignment Type

Writing

In-class and/or outside of class

Outside of class

Formative or Summative

Formative

Assignment

Respond with a written post in the CMS discussion named "Learning Diary". Note the experience you had in clinical training: What exam did you do? What challenges did you have? What successes or new knowledge did you gain? Reflect on your learning and respond to at least 1 classmate per week with encouragement, comment, or a story in relation to their post. A post in the learning diary should be made before each Monday's class session from the previous week. You should have 15 posts and a final summary post to receive 100%

Assignment Type

Writing

In-class and/or outside of class

Outside of class



Formative or Summative

Formative

Assignment

Complete one Poster Project (One concept only)- These posters are the size of a regular poster board cut in half or a quarter. The idea is to have a lightbulb moment (acronym, catchy phrase, or diagram) that will displayed in the classroom for your class and for future classes to learn from. Refer to your sketchbook for ideas. There will be more explanation in the first-class meeting

Assignment Type

Other

In-class and/or outside of class

In-class

Formative or Summative

Formative

Assignment

You will be answering multiple choice and short answer quiz questions from chapter key terms, labeling anatomy diagrams, interpreting ultrasound images, and/or multiple-choice questions.

Assignment Type

Other

In-class and/or outside of class

In-class

Formative or Summative

Summative

Assignment

In this final exam you will answer multiple-choice questions based on anatomy, pathology, scanning protocols, and multimodality imaging comparisons, and image-based case questions featuring ultrasound images with patient history, and/or symptoms in which you will use critical thinking to determine the most likely diagnosis based on sonographic findings and clinical context

Assignment Type

Reading

In-class and/or outside of class

Outside of class

Formative or Summative

Formative

Assignment

Topic: Communicating Across Language and Hearing Barriers in Sonographic Care

Instructions:

Read the posted case study of Ms. Elena Ruiz, a 38-year-old Latina woman with profound hearing loss and limited English proficiency, referred for thyroid ultrasound. Reflect on how communication barriers and social determinants of health affected her imaging experience and clinical outcome.

Your Task:

In your discussion post, address the following:

1. Identify and summarize key disparities in the case, including:

- Patient profile and clinical presentation
- Social determinants of health
- Ultrasound findings and diagnostic challenges

2. Respond to the prompts below using evidence-based reasoning and respectful language:

- How could interpreter services have improved diagnostic accuracy and patient comfort?
- What are best practices for communicating with patients who are both deaf and non-English speaking?
- How can sonographers advocate for equitable care in facilities with limited language access resources?
- What ethical responsibilities do imaging professionals have when communication barriers affect clinical outcomes?

3. Engage with your peers:

After posting, reply to at least one classmate's reflection. Share insights, ask questions, or offer additional strategies for inclusive sonographic care.

Grading Criteria: Thoughtfulness, clarity, relevance to prompts, and respectful peer engagement

Course Materials

Textbooks

Hagen-Ansert, Sandra. S. (2022). Textbook of Diagnostic Sonography. 9th edition. Elsevier.

eBook ISBN: 9780323826495

Hardcover ISBN: 9780323826464

Class Size Information

Class Size

30

Class Size Category

F - Individualized, skills#based instruction/field practice 30

Diversity and Inclusion

Course Design and Materials: Course will incorporate diverse perspectives, authors, and examples that reflect a variety of cultures, identities, and lived experiences. Instructional materials will be reviewed regularly to ensure representation, inclusivity, and alignment with equity-minded practices across disciplines.

Inclusive Learning Environment: Instructors will establish classroom norms and policies that promote respect, civil discourse, and belonging in both online and face-to-face classes. Clear expectations for communication and engagement will support a learning space where all students feel valued and heard.

Accessible Instruction: Course content will be delivered using accessible design. Materials will follow accessibility guidelines within the CMS, including captioned media, readable document formats, and multiple means of engagement to support diverse learning.

Equitable Teaching Practices: Instructors will use transparent and grading criteria, varied assessment methods, and timely feedback to promote fairness and student success. Opportunities for revision, reflection, and multiple demonstrations of learning may be incorporated when appropriate to the discipline.

Culturally Responsive Pedagogies: Instructional strategies will encourage critical thinking about diverse perspectives and systems of power relevant to the course content. Faculty will foster opportunities for students to connect course material to real-world contexts.

Ongoing Reflection and Improvement: Faculty will engage in continuous professional development related to IDEAA principles and reflect on course practices using metacognition to identify opportunities for increased equity, inclusion, and accessibility.

Explain how diversity and inclusion(e.g., gender, culture/race, sexuality, etc.) is infused into the course.

Diversity and inclusion are intentionally infused throughout this course by integrating patient-centered imaging scenarios that reflect a wide range of gender identities, cultural backgrounds, racial and ethnic variations, and sexual orientations. Specific examples of assignments include language barriers and hearing impairment. Instructional content includes anatomical and pathological presentations across diverse populations, with attention to how social determinants of health and cultural beliefs may influence clinical history, imaging access, and diagnostic interpretation. Case-based learning incorporates inclusive language and trauma-informed care principles, particularly when evaluating sensitive structures such as the breast, scrotum, and prostate. Students are encouraged to consider how implicit bias, health disparities, and cultural humility impact sonographic evaluation and documentation. Through multimodality imaging comparison and reflective discussion, learners develop the skills to deliver respectful, equitable care in diverse clinical contexts.

Describe how assignments, instruction, evaluation, course content, and interactions are contextualized for diverse learners promoting an equitable course.

This course is intentionally designed to support diverse learners and promote equity through inclusive assignments, multimodal instruction, fair evaluation, representative content, and respectful interactions. Assignments incorporate varied patient scenarios that reflect anatomical, cultural, and social diversity, encouraging students to apply clinical reasoning across a spectrum of lived experiences. Instruction is delivered through visual, auditory, and kinesthetic methods to accommodate different learning styles, with opportunities for peer collaboration and reflective practice. Evaluation tools are transparent and aligned with both technical competencies and inclusive care principles, ensuring all students are assessed equitably. Course content highlights anatomical variation and health disparities, integrating cultural competence and trauma-informed care into diagnostic interpretation. Interactions are structured to foster empathy, critical thinking, and personal growth, creating a learning environment where all students feel valued and supported.

Interactions**Explain how the course will incorporate student-to-student interaction.**

Students may enter a drawing or digital entry in a sketchbook each week. The students interact by sharing the entry in their sketchbook with one other student at the end of each class. Students will only be sharing what they feel comfortable sharing. They are instructed to not be hesitant to write notes to themselves or worry about their artistic ability. Students participate in reviewing prior quizzes by sharing a quiz question (usually one they missed) with a fellow student- students do not share scores on quizzes. This creates a great interaction, especially the words "I knew that one, I don't know what I was thinking." Promotes support and teaching from fellow students as well.

Explain how the course will incorporate instructor-to-student interaction.

Instructor to student interaction will be contained in the course via case-based lectures, guided image analysis, and real-time feedback during lab and discussion sessions. Faculty will facilitate diagnostic reasoning through case studies, clarifying anatomical and pathological concepts during multimodality comparisons, and provide formative feedback on documentation and scan technique. Interactive review sessions, targeted quizzes, and personalized support during clinical simulations will ensure students receive consistent, responsive guidance aligned with professional sonographic standards.

Explain how the course will incorporate student-to-content interaction.

Students will engage directly with course content through multimodal learning strategies, including lecture-based anatomical analysis, hands-on scanning labs, and case-based assignments. They will interpret sonographic images, correlate findings with clinical history and laboratory data, and compare modalities such as CT, MRI, and nuclear medicine. Structured homework, image review exercises, and diagnostic reasoning tasks will reinforce active engagement with core concepts, while weekly quizzes and visual synthesis projects will deepen understanding of pathology and scanning protocols.

Explain how the course will incorporate student-to-self interaction (metacognitive).

Students will engage in structured reflection activities to monitor their learning progress, evaluate diagnostic reasoning, and identify areas for improvement. Weekly "learning diary" posts, image interpretation logs, and post-lab self-assessments will prompt students to connect course content with their evolving clinical judgment. Through guided prompts and peer discussion, learners will develop metacognitive awareness of how they approach sonographic evaluation, adapt to challenges, and apply feedback to refine their skills