



DMS-520: ABDOMEN & SUPERFICIAL STRUCTURES SCANNING LAB (FORMERLY DMS-120)

Effective Term

Fall 2026

BOT Approval Date

01/15/2026

Discipline

DMS - Diagnostic Medical Sonography

Course Number

520

Course Title

Abdomen & Superficial Structures Scanning Lab (formerly DMS-120)

Short Title

Abdomen Scan Lab

Credit Status (CB 04)

D - Credit - Degree applicable

Units

Lab Units

1.50

Total Units

1.50

Hours

Lab Contact Hours

72-81

Out of Class Hours Lab

0.00

Total Contact Hours

72 - 81

Total Out of Class Hours

0 - 0

Total Student Learning Hours

72 - 81

Is this an existing Extensive Lab?

No

Do you want to propose this for Extensive Lab?

No

Distance Education

No



Catalog Description

This course offers a thorough introduction to abdominal and superficial structure sonography, focusing on patient care, clinical lab interpretation, and the integration of sonographic findings with clinical symptoms. Students explore normal and pathological imaging across various organ systems using gray-scale and Doppler techniques. Lab practical's include abdominal, thyroid, breast, and testicular exams, utilizing live volunteers or high-fidelity ultrasound phantoms to develop scanning skills, anatomical identification, and pathology recognition. (formerly DMS-120)

Requisites

Corequisite(s)

Corequisite(s) (must be taken simultaneously)

DMS-522

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. Perform and document complete ultrasound examinations of abdominal, superficial structures, and vascular structures using proper scanning techniques, image annotation, gray-scale, and doppler imaging.
2. Document an abdominal aorta examination including the aorta and the anterior and lateral branches. Include proper image annotation, scanning techniques, and Doppler techniques
3. Apply appropriate sonographic terminology when describing normal and abnormal anatomy of the abdomen and superficial structures.
4. Collect and document complete patient history and relevant laboratory data to support accurate sonographic interpretation.
5. Distinguish normal from abnormal findings across abdominal and small parts structures using gray-scale and Doppler imaging.
6. Prepare and execute scanning protocols, including patient positioning, scanning planes, transducer selection, and machine settings for abdominal and superficial exams.
7. Acquire diagnostic-quality sonographic images, assess image quality, and annotate structures using standardized protocols.
8. Document technical remarks and measurements on examination worksheets using accurate sonographic terminology and protocol-based reporting.
9. Compare sonographic findings with other imaging modalities (CT, MRI, radiography) to support differential diagnosis and clinical decision-making.
10. Evaluate diverse anatomical, cultural, and psychosocial factors influencing sonographic practice to ensure respectful, patient-centered care across varied populations.

Learning Outcome Information

Course Learning Outcomes

Learning Outcome

1. Students will complete and analyze a full abdomen ultrasound examination including proper labeling, imaging protocol, and measurements for scanning the abdominal organs.
2. Students will perform a breast exam on the phantom provided, using proper annotation of the images and correct protocol and measurements.
3. Students will complete and analyze a thyroid ultrasound exam with proper image annotation and demonstrate correct imaging protocol and measurements.
4. Students will complete and analyze a testicular ultrasound exam on the phantom provided, using proper annotation of the images and correct protocol and measurements.
5. Students will obtain and evaluate a sonographic image of the portal vein with color flow and doppler waveform.
6. Students will develop and demonstrate inclusive sonographic practice by adapting scanning techniques, communication strategies, and patient care protocols to meet the anatomical, cultural, and individual needs of patients from diverse backgrounds.

Content

Course Lab Content

- I. General Scanning Principles
 - A. Anatomic Definitions
 - B. Scanning Terminology and Definitions
 - C. Transducer Orientation and Manipulation
 - D. Image Annotation and Labeling Standards
 - E. Interpretation of Sonographic Characteristics
 - F. Patient Preparation and Positioning
 - G. Preliminary Report and Documentation
 - H. CAAHEP Emphasis: Image Optimization and Protocol Adherence
- II. Abdominal Wall and Superficial Tissues
 - A. Subcutaneous Tissue Layers
 - B. Muscle Groups and Sonographic Appearance
 - C. Scanning Techniques and Protocols
 - D. CAAHEP Emphasis: Recognition of Normal vs. Abnormal Tissue Planes
- III. Vascular Structures
 - A. Patient Preparation and Equipment Considerations
 - B. Scanning Techniques for Vascular Imaging
 - C. Arterial Anatomy
 1. Aorta
 2. Celiac Artery and Branches
 3. Superior Mesenteric Artery
 4. Renal Arteries
 5. Inferior Mesenteric Artery
 6. Common Iliac Arteries
 - D. Venous Anatomy
 1. Inferior Vena Cava
 2. Superior Mesenteric, Renal, Splenic, and Common Iliac Veins
 3. Portal and Hepatic Veins
 - E. Relationship of Arteries and Veins
 - F. Doppler Imaging Techniques
 - G. CAAHEP Emphasis: Hemodynamic Evaluation and Flow Interpretation
- IV. Liver

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- A. Anatomy and Vascular System
 - B. Liver Function Tests and Clinical Correlation
 - C. Patient Instructions and Scanning Technique
 - D. Technical Considerations
 - E. Sonographic Appearance of Normal and Abnormal Liver
 - F. Congenital Anomalies and Pathology
 - G. Doppler Imaging of Hepatic Vasculature
 - H. CAAHEP Emphasis: Integration of Clinical History and Lab Data
- V. Gallbladder and Biliary System
- A. Anatomy and Sectional Views
 - B. Laboratory Values
 - C. Variants and Congenital Anomalies
 - D. Sonographic Examination Techniques
 - E. Pathology and Sonographic Appearance
 - F. Doppler Imaging of Biliary Flow
 - G. CAAHEP Emphasis: Documentation and Protocol Consistency
- VI. Pancreas and Retroperitoneal Structures
- A. Anatomy and Sonographic Correlation
 - B. Laboratory Values and Indications
 - C. Scanning Technique and Protocol
 - D. Pathology and Sonographic Appearance
 - E. Doppler Imaging Considerations
 - F. CAAHEP Emphasis: Recognition of Pancreatic Variants and Vascular Relationships
- VII. Spleen
- A. Anatomy and Laboratory Values
 - B. Sonographic Appearance and Technique
 - C. Pathology and Doppler Imaging
 - D. CAAHEP Emphasis: Clinical Relevance in Trauma and Hematologic Disorders
- VIII. Gastrointestinal Tract
- A. Examination Preparation
 - B. Anatomy of Bowel Wall, Esophagus, and Appendix
 - C. Pathology and Sonographic Appearance
 - D. Scanning Techniques
 - E. CAAHEP Emphasis: Identification of GI Emergencies and Sonographic Limitations
- IX. Kidneys and Urinary Tract
- A. Anatomy and Renal Function Tests
 - B. Sonographic Appearance and Technique
 - C. Congenital Anomalies and Pathology
 - D. Doppler Imaging of Renal Vasculature
 - E. CAAHEP Emphasis: Correlation with Urinalysis and Clinical Symptoms
- X. Adrenal Glands
- A. Anatomy and Laboratory Values
 - B. Sonographic Technique and Pathology
 - C. CAAHEP Emphasis: Identification of Adrenal Masses and Pediatric Considerations
- XI. Thyroid, Parathyroid, and Neck
- A. Anatomy and Laboratory Values
 - B. Sonographic Scanning Techniques
 - C. Pathology and Doppler Imaging
 - D. CAAHEP Emphasis: Integration of Endocrine Function and Imaging Findings

XII. Breast

- A. Anatomy and Normal Variants
- B. Instrumentation and Scanning Technique
- C. Pathology and Sonographic Appearance
- D. Ultrasound-Guided Interventional Techniques
- E. CAAHEP Emphasis: Role of Sonography in Breast Cancer Detection and Biopsy Guidance

XIII. Scrotum and Prostate

- A. Anatomy and Sonographic Technique
- B. Pathology and Doppler Imaging
- C. Technical Considerations
- D. CAAHEP Emphasis: Male Reproductive Imaging and Emergency Conditions

XIV. Inclusive Sonographic Practice

- A. Gender-Affirming Care in Ultrasound
- B. Cultural Sensitivity in Patient Interaction
- C. Trauma-Informed Scanning Techniques
- D. Inclusive Terminology and Documentation
- E. Mock Patient Scenarios: Transgender and Diverse Populations
- F. CAAHEP Emphasis: Ethical and Professional Standards in Diverse Clinical Settings

Methods of Instruction

Method

Film/video Viewing and Discussion

Integration

Media presentations, such as, webinars and internet resources will be presented demonstrating sonographic images and scanning protocols.

Method

Lecture

Integration

Lecture will be used to present material about anatomy, physiology, laboratory tests and pathology as seen by ultrasound.

Method

Observation and Demonstration

Integration

Student will observe as the instructor demonstrates an examination and scanning techniques on an ultrasound machine using a student model.

Method

Scanning activities

Integration

Scanning, by the student, using an ultrasound machine and a student model, ultrasound simulator, or ultrasound phantom to practice and enhance scanning skills.

Method

Observation and Demonstration



Integration

Faculty-Led Demonstrations

Instructors will model scanning techniques and protocol adherence using simulators, phantoms, and live volunteers.

Method

Individualized Instruction

Integration

Supervised Hands-On Practice

Students will engage in structured lab sessions with real-time feedback on technique, image quality, and patient interaction.

Method

Directed Study

Integration

Interactive Lectures and Case Studies

Core concepts such as anatomy, pathology, lab values, and clinical correlation will be taught through multimedia presentations and group discussion.

Method

Role Playing/Simulation

Integration

Scenario-based simulation will be used to teach principles of gender-affirming and trauma-informed sonographic care. The instructor will introduce the clinical context and communication strategies during a pre-lab briefing, followed by paired role-play to explore both patient and sonographer perspectives. Students will then engage in hands-on scanning using testicular phantoms to apply respectful interaction techniques and protocol adherence. A facilitated group debrief and guided reflection will reinforce inclusive care strategies and promote critical thinking.

Methods of Evaluation

Method

Class Participation

Integration

Students will be evaluated on their active participation during group review sessions of abdominal and small parts ultrasound images. These sessions will focus on assessing proper labeling, image quality, and anatomical accuracy. Through guided critique, students will demonstrate their ability to evaluate the diagnostic utility of sonographic images and identify potential pathology. Participation will reflect each student's engagement, critical thinking, and ability to articulate observations using appropriate clinical terminology. This method supports development of interpretive skills essential for professional practice.

Method

Class Work

Integration

Students will be evaluated on their ability to identify and explain the spatial relationships among major abdominal organs and vascular structures. Assessments will be faculty observation of the model and focus on the students understanding of anatomical orientation, structural interconnectivity, and the relevance of these relationships to sonographic imaging. This evaluation supports the development of spatial reasoning and reinforces foundational knowledge essential for accurate abdominal ultrasound interpretation.



Method

Exams/Tests

Integration

Exams and Tests will be used to assess ability to retain and process information on abdomen and small parts imaging.

Method

Final Performance

Integration

Students will complete a comprehensive practical examination designed to assess their proficiency in performing a full abdominal ultrasound. Evaluation will focus on the student's ability to acquire diagnostic-quality images of key abdominal structures, adhere to standardized imaging protocols, demonstrate anatomical accuracy, and apply proper labeling and annotation techniques. This summative assessment reflects clinical readiness and supports alignment with professional sonography standards.

Method

Homework

Integration

Students will be evaluated on their ability to research and present a comprehensive sonographic case study. Assessment will focus on the clarity of writing, organization of clinical information, and depth of research. Emphasis will be placed on the student's ability to synthesize patient data, including demographics, clinical presentation, imaging findings, and relevant outcomes, to demonstrate understanding of disease processes and diagnostic application in ultrasound.

Method

Psychomotor skills testing

Integration

Psychomotor skills testing will be used to evaluate students ability to complete an entire assigned examination demonstrating scanning techniques to produce images using an ultrasound machine including an accurate write-up of the exam.

Method

Quizzes

Integration

Quizzes will monitor and evaluate the student's immediate understanding of concepts in abdomen and small parts scanning techniques.

Method

Role-playing/Simulation

Integration

Student performance will be evaluated through direct observation using a structured rubric that assesses respectful communication, adherence to gender-affirming and trauma-informed care principles, and technical proficiency during hands-on scanning. Role-play interactions will be assessed for empathy, clarity, and professionalism. Post-lab reflection worksheets will be reviewed for insight, critical thinking, and application of inclusive care strategies. Instructor feedback and peer discussion during the debrief will further support formative evaluation and continuous improvement.



Assignments

Assignment Type

Other

In-class and/or outside of class

In-class

Formative or Summative

Formative

Assignment

In-Class Assignment: Abdominal Anatomy Modeling Workshop

Objective: This hands-on activity will help you visualize and understand the spatial relationships between major abdominal organs and vascular structures.

What You'll Do: During class, you'll work individually or in small groups to build a 3D model of the abdominal cavity using colored play-dough. Each color will represent a different organ or vessel. Your model should include the following key structures:

Organs: Liver, spleen, kidneys, pancreas

Vessels: Aorta, inferior vena cava (IVC), celiac trunk, superior mesenteric artery (SMA), renal arteries and veins, iliac arteries and veins

Your Task: Shape and place each structure in anatomically correct positions; Demonstrate how these structures relate to one another spatially; Be prepared to explain your model to the class, highlighting key anatomical relationships and clinical relevance

Why It Matters: This activity reinforces your ability to correlate sonographic anatomy with physical structure, which is essential for accurate scanning and interpretation in clinical practice.

Assignment Type

Other

In-class and/or outside of class

In-class

Formative or Summative

Formative

Assignment

Image Acquisition Lab Assignment

Objective: To develop hands-on proficiency in performing ultrasound scans and producing diagnostic-quality images across key anatomical regions.

What You'll Do: During scheduled lab sessions, you will perform ultrasound scans of the following areas: Abdomen; Thyroid; Breast; Testicles.

Scans will be conducted using a combination of live volunteers, simulators, and phantoms. For each scan, you are expected to:

Apply correct scanning protocols and patient positioning; Optimize grayscale settings for clear image quality; Use Doppler imaging when appropriate to assess vascular flow; Annotate images accurately using standard sonographic terminology

Upload to the digital PACS, a complete set of annotated images for each region scanned, demonstrating proper technique, optimization, and documentation.

Why It Matters: This lab assignment reinforces your ability to acquire and interpret sonographic images in a clinical setting, preparing you for real-world patient care and certification standards.



Assignment Type

Other

In-class and/or outside of class

In-class

Formative or Summative

Formative

Assignment

Technologist Worksheet Documentation Assignment

Objective: To practice accurate and professional documentation of sonographic exams using standardized technologist worksheets.

What You'll Do: For each lab exam you perform—including abdominal, thyroid, breast, and testicular scans—you will complete a technologist worksheet that includes the following components:

Patient History: Brief summary of relevant clinical information and indications for the exam

Measurements: Accurate dimensions of anatomical structures and/or pathology as observed during the scan

Technical Remarks: Notes on scanning technique, image quality, challenges encountered, and equipment settings

Preliminary Impressions: Observations based on sonographic findings using correct and objective terminology

Expectations: Use appropriate sonographic language and abbreviations; Ensure clarity, accuracy, and professionalism in all entries; Submit completed worksheets at the end of each lab session for review

Why It Matters: This assignment reinforces your ability to document sonographic exams in a clinical format, preparing you for real-world technologist responsibilities and certification standards.

Assignment Type

Writing

In-class and/or outside of class

In-class

Formative or Summative

Formative

Assignment

Perform a testicular ultrasound on an ultrasound phantom representing a mock patient. A transgender woman is presenting with discomfort and swelling. The patient expresses anxiety about the procedure due to past medical trauma and misgendering. Your role is to:

Introduce the procedure using affirming language.

Ensure privacy and comfort throughout the scan.

Adapt scanning technique to accommodate patient concerns.

Document written findings on a technologist worksheet using inclusive and medically accurate terminology.

Assignment Type

Other



In-class and/or outside of class

In-class

Formative or Summative

Formative

Assignment

Assignment: Image Critique and Peer Review

Objective:

To strengthen your ability to evaluate sonographic images by presenting your work for constructive feedback from peers and instructors.

What You'll Do:

You will select sonographic images from your lab scans: such as abdominal, thyroid, breast, or testicular exams, and present them either during lab sessions or in the designated online discussion forum. Your presentation should include:

- A brief description of the scan and its clinical context
- Annotations or notes highlighting key anatomical structures
- Observations on image quality, optimization, and technique

Your Role as a Reviewer:

You'll also review your classmates' images, offering respectful, constructive feedback focused on:

- Diagnostic clarity
- Anatomical accuracy
- Use of proper scanning protocols and labeling

Why It Matters:

This assignment helps you develop critical thinking, visual analysis, and collaborative skills essential for clinical practice. Learning to give and receive feedback prepares you for real-world teamwork and continuous improvement.

Assignment Type

Other

In-class and/or outside of class

In-class

Formative or Summative

Summative

Assignment

Final Practical Exam

Using the instructor provided rubric, perform a complete abdominal or small parts scan under timed conditions, demonstrating scanning technique, proper image acquisition, and documentation.

Assignment Type

Writing

In-class and/or outside of class

In-class

Formative or Summative

Summative



Assignment

Post a final summary of the course in the CMS Discussion. Reflect on new knowledge this semester. What were your strengths? What were your weaknesses? Summarize the course in terms of course strengths and suggestions for improvements.

Assignment Type

Reading

In-class and/or outside of class

In-class

Formative or Summative

Formative

Assignment

Read the following article "How Physicians Can Deliver Better Gender-Affirming Care"

Source: Sermo (2025)

Evaluate respectful communication strategies in a class discussion.

Follow-up in the lab using groups of two: one acting as the sonographer, the other as the mock patient while using testicular phantoms, perform the ultrasound protocol while practicing trauma-informed interaction and protocol adherence. Roles rotate to ensure everyone practices both perspectives.

Debrief and Reflection: participate in a group discussion on challenges, insights, and strategies for improving inclusive care.

Assignment Type

Reading

In-class and/or outside of class

Outside of class

Formative or Summative

Formative

Assignment

Read chapter 23, pages 789-804, of the assigned textbook "Diagnostic Ultrasonography" by Sandra Hagen-Ansert. In the online CMS discussion or sketchbook: summarize the imaging protocol for the scrotum and testicular imaging protocol. This reading will support the application of scrotal/testicular exam protocols to evaluate both normal and disease processes found in the male patient. Apply your knowledge in the campus lab or clinical hospital to complete a diagnostic scrotal/testicular exam. Review the exam with your preceptor.

Course Materials**Textbooks**

Hagen-Ansert, Sandra. (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.

Students put patient care didactic knowledge into practice in this course by performing a patient interview before starting the imaging exam, recognizing cultural differences from their own, practicing appropriate communication, and practicing patient positioning and draping. Course objectives and learning outcomes are supported through the concurrent clinical observation course and practice within the hospital environment. Prior foundational knowledge of patient care scenarios and case studies are also put into practice that seeks to foster knowledge, empathy, and patient advocacy in developing future healthcare professionals. Sonography students and, as future graduates, will encounter scanning patients from diverse populations.

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

The course resources are offered in multiple forms to offer diverse learning methods to students. Audio learners can utilize voice-over lectures; Visual learners can utilize power-point diagrams, textbook, lab demonstrations, and videos; Hands-on learners can utilize lab simulation and practice concepts or protocols in the campus lab.

This course promotes equity by designing assignments, instruction, evaluation, content, and interactions to support diverse learners. Students engage with inclusive case studies, multimodal instruction, and flexible assessments that reflect varied backgrounds, learning styles, and clinical realities. Course content incorporates culturally responsive scenarios, gender-affirming patient care, and trauma-informed practices. Course reflective activities, and hands-on labs ensure all students can succeed while developing the clinical and cultural competence essential for inclusive sonographic care.

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

Students will be scanning each other in the campus lab with interaction that supports tutoring and encouragement for each other in their scanning ability.

Peer Feedback and Reflection

After lab practical's, students provide constructive feedback on each other's scanning technique, image quality, and patient interaction. Guided reflection prompts help students evaluate their own and their peers' growth.

Skill-Building Through Role Play

Mock patient scenarios, including culturally diverse and DEI-focused cases, are performed in pairs or teams, allowing students to practice inclusive care and professional dialogue.

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

This course provides opportunities for students to observe instructor demonstrations of patient care or scanning protocols and then practice what was observed. Instructors interact through face to face lab opportunities where students may ask questions. The CMS houses announcements, syllabi, voice-over lectures, and course schedule through modules. Instructor uses real-life experience stories during lectures to enhance student learning. Instructor encourages use of office hours or meeting after class if student needs assistance or guidance.

Interactive Demonstrations and Q&A

Faculty lead live scanning demonstrations, encouraging students to ask questions, interpret findings, and discuss clinical relevance.

Individualized Feedback and Skill Assessment

Instructors observe student performance and offer personalized feedback on scanning proficiency, documentation, and patient interaction. Structured rubrics and checklists guide formative and summative evaluations.

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

The CMS houses announcements, syllabi, voice-over lectures, and course schedule through modules. Lab protocol rubrics are used extensively during lab sessions for step by step scanning instruction, reference, and reading assignments.

Hands-On Imaging Labs: Students interact directly with sonographic content by scanning live volunteers, simulators, and high-fidelity phantoms. This tactile engagement reinforces anatomical recognition, scanning protocols, and image interpretation.

Case-Based Learning Modules: Students analyze real-world scenarios that integrate patient history, lab data, and sonographic findings. These modules challenge students to apply content knowledge to clinical decision-making.

Protocol Practice and Reinforcement: Students repeatedly engage with scanning protocols, image labeling standards, and documentation formats—ensuring mastery through repetition and refinement.

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

This course provides opportunities for students to think about how they will provide the best patient care and diagnostic interpretation from beginning to end of their interaction with each patient they care for. Students are encouraged to practice positive self-talk and reflect on real-life clinical experiences and knowledge gained from clinical observations.

DEI Reflection Activities Following inclusive care simulations (e.g., transgender patient scenarios), students reflect on their biases, assumptions, and growth in cultural humility. These reflections deepen empathy and ethical awareness.

End-of- Semester Reflections: At the conclusion of the semester, students write brief reflections on what they've learned, what challenged them, and how they plan to improve.