

Essentials of Sonography

Student Workbook

Jackson College

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Dear Student,

Welcome to Essentials of Sonography I'm excited to have begin and look forward to assisting each student with his or her educational goals. The student workbook is meant to provide a structured, comprehensive hands-on tool for the student. JCC promotes autonomy and encourages students to take the "student-centered approach; putting an emphasis on demonstrating and modeling skill sets. The student-centered style will encourage a *"see one, do one, teach one" method.*

I recognize that students have multiple learning styles, along with unique backgrounds. I will work to identify each student's learning style. A student might hear comments like: "I show JCC students how to properly do a task or work through a skill and then I'll help them master the task or problem solution through demonstration. It's important that students can independently solve similar problems by using and adapting demonstrated methods and theories."

I will work diligently to create trusting relationships and create a positive learning environment. Student's ideas and suggestions will create a well-rounded and diverse course for all learners.

DMS 108 Essentials of Sonography

Instructor

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Course Description:

This course will address the high priorities in the health care field such as good character, strong work ethic, and professional traits and behaviors that apply to all health care workers. Affective domain as well as the ability to process and understand physical relationships among objects will be assessed through scanning exercises.

Required Texts:

Essentials of Sonography and Patient Care Third Edition, Craig, M., W. B. Saunders Co., 2006.
 ISBN **ISBN-10:** 1416001700, **ISBN-13:** 978-1416001706

Course Objectives:

At the completion of this course the student will show by oral or via demonstration that he/she understands and is competent to perform or demonstrate the following:

1. General pertinent patient care related to sonography.
2. Explain and demonstrate proper affective Domain, which includes, but is not limited to the following:
 - Receiving / Attending - willingness to become aware
 - Responding - appreciating or internalizing
 - Valuing - accepting, preferring, becoming committed to.
 - Conceptualizing / Organizing - incorporating into a value system
 - Characterizing by value - orientation toward / identification with.
3. Universal Precautions.
6. The history of ultrasound and its medical uses.
7. Sonographic terminology.
8. Sonographic scanning planes.
10. Scanning motion and transducer manipulation.
11. Professional interactions, verbal, non-verbal, & in writing with patients, peers and health care teams.
12. Demonstrate knowledge of sonographic anatomy
13. Perform and demonstrate basic scanning techniques
14. Explain and demonstrate proper ergonomics while scanning.
16. Demonstrate an ability to communicate in an appropriate and constructive manner.
17. Recognize and gain awareness of spatial recognition abilities.

Associate Degree Outcomes

The goals of this course include the successful achievement of measurable outcomes defined by Jackson Community College as vital to the educated individual at the Associates Degree level. The ADO assessed in this course is: ADO 7- Critical thinking at the developing level.

Attendance Policy

Your success in this course relies heavily on your attendance. It is not possible to advance and excel in the scanning skills needed prior to beginning your clinical experience if you are not here on a consistent basis.

One absence will not result in any penalty to your grade. Subsequent absences will result in a deduction of 20 points each. Three or more absences will result in a failing grade for this course.

Tardiness is a disruption to the instructor as well as to your classmates. If the weather looks like it may delay you in getting to class, give yourself a little more time for your trip. Please be mindful of this and make every attempt show up on time.

Student and Facilitator's Responsibilities

- **Student Responsibilities:**

Students are expected to participate and be prepared for each session. It is presumed by the facilitator that assignment, including reading, will be completed on time prior to material on subjects being presented; such preparations allows the student the best learning opportunities to understand material presented and pose questions in areas requiring clarity. The pace of this course makes it very difficult for a student to catch up once a student falls behind.

It is highly suggested by the instructor that students utilize as many references as possible to enhance their learning and understanding.

Facilitator's Responsibilities:

The facilitator's responsibilities include facilitate learning by providing and explaining the necessary materials for each student to understand the assignments and develop course goals, objectives, and performance objectives to a near mastery level. See JCC DMS Handbook for a listing of these goals, course objectives and performance objectives. Knowledge gained from this course should aid students in their clinical experiences. Classes will begin on time weather permitting.

DMS Lab Rules

1. Show up for class on time and be prepared to participate
2. Take advantage of all opportunities to scan.
3. Take the initiative to be involved in every learning opportunity.
4. Accept constructive criticism from instructors and fellow students.
5. Seek to help others with challenging situations.
6. Ask questions or volunteer information pertinent to your knowledge.
7. Demonstrate appropriate communication to others.
8. Demonstrate and maintain a positive attitude.
9. Demonstrate patience for others.
10. Show respect for the patient's/model's modesty and dignity.
11. Demonstrate concern for patient's/model's comfort.
12. Communicate effectively and appropriately with others.
13. Behave in a manner that promotes friendliness and cooperation.
14. Demonstrate eagerness to perform assigned tasks.
15. Demonstrate a willingness to work with/for others to accomplish goals.
16. Demonstrate an ability to communicate in an appropriate and constructive manner.
17. Demonstrate professionalism in attendance and conduct.
18. Demonstrate respect for the equipment and lab environment
19. Bring your own towel.
20. Do not monopolize scanning opportunities.
21. Clean transducers between patients/models.
22. No scanning without supervision from lab instructors.
23. Computer use is limited to lab related material.
24. Students are responsible for learning experiences.
25. All students must submit a signed or unsigned scan model consent form.
26. Scan models must first sign a scan model release form.
27. Shut down and clean machines in your area before you leave the lab.
28. No eating or drinking in the lab.
29. No cell phone use during lab sessions

Weekly Lessons and Assignments:

<u>Date</u>	<u>Topic</u>	<u>Due Date</u>
Week 1	Introductions What IS expected and what TO expect Lab policies and Orientation Q & A CAAHEP Accreditation Affective domain What is Ultrasound and how does it work?	
Week 2	Spatial Recognition skills MSI: Ergonomics and exercises Scanning planes Machine overview and cleaning Draping, gel application, Universal Precautions Small Parts Scanning Intro to Thyroid Anatomy	Read Chapter 1 Read Chapter 2
Week 3	Introduction scripts Small Parts Scanning Thyroid	Read Chapter 4
Week 4	Small Parts Scanning Thyroid Scan Test Affective Domain Evaluation #1	Read Chapter 6 and develop your introduction script and share in class.
Week 5	Special Procedures Discussion Vascular Scanning Intro to Carotid Ultrasound Patient History Explanation of Procedure	Read Chapter 3
Week 6	Vascular Scanning Carotid Ultrasound Patient History Explanation of Procedure	Read Chapter 5 Student SWOT I analysis.
Lesson 7	Vascular Scanning Carotid Ultrasound Test Patient History Explanation of Procedure	Midterm Consultations
Lesson 8	Abdominal Scanning Carotid Ultrasound Test Explanation of Procedure Scanning Windows. Tips and Technique Affective Domain Evaluation #2	Read Chapter 9 and formulate 1 ethical question to discuss with the class
Lesson 9	Abdominal Scanning Intro to Abdominal Vasculature Explanation of Procedure Scanning Windows. Tips and Technique	Formulate 1 additional ethical question to discuss with the class

Lesson 10	Abdominal Scanning Abdominal Vasculature Scan Test Explanation of Procedure Scanning Windows. Tips and Technique	Read Chapter 10 and formulate 1 question related to the job market or compensation to discuss with the class
Lesson 11	Final Scan Test	Read Chapter 11 and formulate 1 statement or declaration of what it means to be a professional sonographer. Student SWOT II analysis
Lesson 12	Scheduled Consultations Final Affective Domain Evaluation	Dress appropriately for consultation

Grading System:

Assessment Tool	<u>Quantity</u>	<u>Points</u>
Scan Test	3	60
SWOT analysis part 1 and part 2	2	60
Affective Domain Evaluation	2	80
Final Scan Test	1	100
Final Affective Domain Evaluation	1	100
Total		400

Grading Scale:

95-100%- 4.0

90-94%-3.5

85-89%-3.0

80-84%-2.5

75-79%-2.0

70-74%-1.5

65-69%-1.0

60-64%-0.5

Academic Honesty Policy

Academic honesty is expected of all students. It is the ethical behavior that includes producing their own work and not representing others' work as their own, either by plagiarism, by cheating, or by helping others to do so.

Plagiarism is the failure to give credit for the use of material from outside sources. Plagiarism includes but is not limited to:

- Using data, quotations, or paraphrases from other sources without adequate documentation
- Submitting others' work as your own
- Exhibiting other behaviors generally considered unethical

Cheating means obtaining answers/material from an outside source without authorization. Cheating includes, but not limited to:

- Plagiarizing in all forms
- Using notes/books without authorization
- Copying
- Submitting others' work as your own or submitting your work for others
- Altering graded work
- Falsifying data
- Exhibiting other behaviors generally considered unethical

Collaboration

While JCC encourages students to collaborate in study groups, work teams, and with lab partners, each student should take responsibility for accurately representing his/her own contribution.

Consequences/Procedures

Faculty members who suspect a student of academic dishonesty may penalize the student by taking appropriate action up to and including assigning a failing grade for the paper, project, report, exam, or the course itself. Instructors must document all instances of academic dishonesty beyond those of a very minor nature, in writing to the academic dean.

The Office of the Academic Deans will record and track students who have been reported as having cheated. If the same student cheats in other courses, the dean will enact sanctions appropriate to level of infraction. The sanction will be selected in consultation with the involved faculty. The Dean can administer consequences up to and including suspension.

Student Appeal Process

In the event of a dispute, all parties should follow the Academic Complaint policy. This policy is presented in Student Rights and Responsibilities (Student Handbook) and the Master Agreement.

Student Complaints/Academic

A student complaint is any non-civil rights related complaint generated by the student concerning the work-related activities of any member of the bargaining unit (such as grade disputes). Instructors shall not be subject to any disciplinary action as a result of a student grievance over strictly academic issues. The following steps are required of students wishing to file a complaint:

1. Student Meets with Instructor

Students must initiate a conference with the instructor with whom they have a complaint no later than the end of the fourth week of the Fall or Winter/Spring semester following the relevant incident/dispute. One representative, who must be from JCC (a current student, instructor or administrator) may be requested by each party to participate in this informal meeting.

2. Student Puts complaint in Writing

If the conflict isn't resolved in the meeting between the student and instructor, the student, if he/she chooses to pursue the matter further must put the complaint in writing using the form provided and submit it to the appropriate Department Chair.

3. Department Chair Holds an Informal Hearing

The Department Chair will convene a meeting with the student and the instructor following the guidelines in the faculty manual. The department chair will conduct any necessary investigation prior to the meeting.

4. Complaint Submitted to Dean

If the student or instructor is unsatisfied with the results of the meeting with the department chair, the formal written complaint and the instructor's written statement of facts as he/she understands them will be submitted to the supervising Dean. The Dean shall promptly provide the instructor and the Association President with a true and complete copy of the student's written statement(s).

5. Dean Holds a Hearing

Within five (5) work days of the time the instructor and the Association should have received the copies of the student's written

statement(s), the Dean shall contact the instructor and the Association President to arrange a formal hearing. Parties of interest shall include the student, the ombudsman (if the student so desires), the instructor, his/her Association representative and the Department Chair. Other individuals may be present at the hearing but they may not participate in the proceedings.

6. Dean Issues a Resolution

Within five (5) work days after the hearing, the Dean will distribute a written resolution of the complaint to the student, instructor and the Association President. The written resolution will state the facts as assessed by the Dean and indicate that appropriate action will be taken. No statement of disciplinary action will be disclosed to the student until final resolution of the complaint. If the College plans to discipline the instructor, as a result of this complaint, the instructor and the Association President will be notified, in writing, accompanying the written resolution of the complaint.

7. Appealed to the Executive Vice President

In the event that either the student or the instructor is not satisfied with the Dean's disposition of the complaint, the disposition may be appealed to the Executive Vice-President within five (5) work days.

8. Executive Vice President Holds a Meeting

Within five (5) days of the Executive Vice-President's receipt of an appeal, he will arrange a meeting with the parties of interest and their respective representatives in an attempt to resolve the matter.

9. Executive Vice President Rules on the Appeal

Within five (5) work days after the meeting with the Executive Vice-President, the Executive Vice-President shall give a written disposition of the matter.

10. Appeal through Grievance

The disposition of the Executive Vice- President may be the subject of a grievance, initiated at Step 2 under the grievance procedure contained in the Master Agreement. 2005-2008 Agreement between JCC and JCCFA

What the Beginner Student Should Know

Basic Transducer skills:

- Gently hold the probe and make *small* movements with just the tip of your fingers.
- Don't "wrap" your hand around the probe this will lead to clumsy, uncontrolled movements.
- Relax; make the transducer an extension of your hand. Your hand is the tool that guides the transducer and your fingertips are what "steers" the beam.
- Place the transducer firmly on the skin to maintain good contact with the gel and skin surface. Watch out for "heavy hand" syndrome...
- Become ambidextrous

Imaging Essentials:

- Keep the image CENTERED (transverse)- As you move along (up and down) keep the vessel centered on the screen
- Keep the sound beam (transducer) perpendicular to the structures being imaged. This ensures that many echoes will return to the transducer. Move the beam around till you find the optimal image.
- When in the sagittal view, keep the sound beam level

Moving the Probe

- Sliding: Moving the transducer along the surface of the skin, medial, lateral, caudad, or cephalad
- "Heel-Toe" or Rocking: In the long axis of the beam move the beam "uphill" or "downhill". In transverse, the vessel will move from side to side
- Angling (tipping): Moving the beam across the axis, side to side. In the long axis view the view will be lateral and medial'
- Rotating: Twisting the transducer

Imaging Techniques: Screen Orientation/Vessel Anatomy

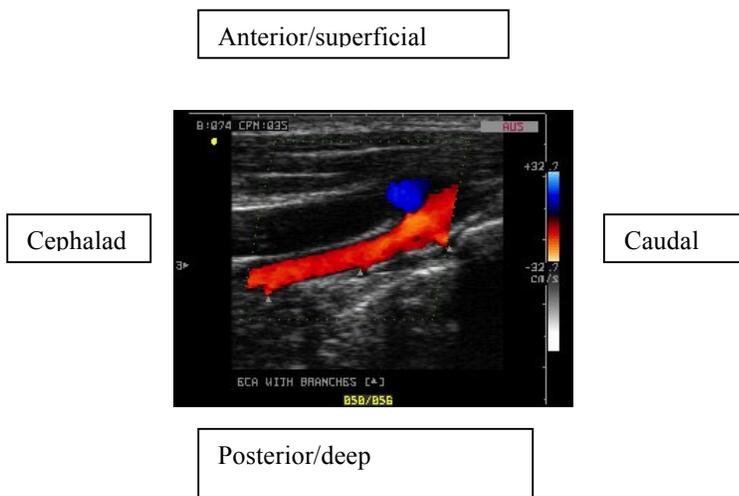
Screen Orientation

When you look at the screen, you should assume that you are looking at the person facing you in anatomical position. When we talk about screen orientation it is the direction or position on the screen. Using the transducer as a guide, keep the “notch” to the patient’s right at all times. Do not flip the transducer or image when switching from right to left.

The top of the screen is ALWAYS anterior/superficial, whether you are in transverse or sagittal. The bottom is ALWAYS posterior/deep, again whether you are in transverse or sagittal.

When you are scanning in transverse, the left side of the screen is the patient's right; the right side is the patient's left. Medial and lateral will vary depending on what you are imaging.

The image below represents the ECA in sagittal view



Carotid Vasculature

- Right common carotid artery-Begins at the innominate bifurcation and ends at the internal and external bifurcations
- Left common carotid artery-Begins at the aortic arch (second branch) and ends at the external and internal carotid bifurcation
- Internal Carotid artery- Begins at the common carotid bifurcation and terminates at the circle of Willis. The ICA is a low resistant vascular bed
- External Carotid artery-Begins at the common carotid bifurcation- **The number one way to determine ECA from ICA is the extra-cranial branches. There are eight branches.** The ECA is a high-resistant vessel

Carotid Vasculature Imaging Windows

- Anterior Window- The probe is positioned along the anterior portion of the neck. The probe will be upright between the trachea and sternocleidomastoid muscle. The vessels are closer to the probe with this approach, making the vessels slightly fuzzier looking. This approach is useful for thick necks. Have the patient's head straightforward for this approach, with chin slightly lifted.
- Lateral Window- The probe is positioned lateral on the neck (side of neck). Perpendicular to the ear. The walls of the vessels are typically brighter from the window. The patient's head should be slightly turned with chin slightly lifted.
- Posterior Window- The probe is positioned on the posterior neck, laying the probe back and angling the sound beam towards the face. This approach is best for imaging the distal ICA.

Abdominal Vasculature

ARTERIES

- Aorta-Originates at the aorta valve of the heart. Tapering distally and terminates at the common iliac bifurcation. The aorta courses left lateral of the midline.

VEINS

- Inferior Vena Cava (IVC)-Terminates at the right atrium of the heart. Courses right lateral of the midline

DMS 108 Essentials Of Sonography
Practical Scan Exam 1=Thyroid imaging

Section I

Student demonstrated universal precautions at all time.

()yes ()no

Student introduces him/herself

()yes ()no

Student explains procedure to patient

()yes ()no

Student properly draped the patient showing respect for their modesty

()yes ()no

Student demonstrates appropriate ergonomics

()yes ()no

_____ /5 points

Section II

Student can demonstrate the Longitudinal right thyroid Points

_____ Demonstrates item(1) _____ Appropriate Technique (2)

Student can demonstrate a longitudinal left thyroid.

_____ Demonstrates item(1) _____ Appropriate Technique(2)

Student can demonstrate a transverse right thyroid.

_____ Demonstrates item(1) _____ Appropriate Technique(2)

Student can demonstrate a transverse left thyroid.

_____ Demonstrates item(1) _____ Appropriate Technique(2)

Student can demonstrate the isthmus region of the thyroid gland.

_____ Demonstrates item(1) _____ Appropriate Technique(2)

Total Points: _____ /20

Student Name : _____

Instructor Signature : _____

What is the Affective Domain?

This summary was compiled by [Karin Kirk](#), SERC.

Background

The affective domain is part of a system that was published in 1965 for identifying, understanding and addressing how people learn. Part of *Bloom's Taxonomy*, this classification of educational objectives includes the cognitive domain, the affective domain and the psychomotor domain.

The cognitive domain is organized in a hierarchy that begins with the straightforward acquisition of knowledge, followed by the more sophisticated cognitive tasks of comprehension, application, analysis, synthesis, and evaluation.

The psychomotor domain relates to the learning of physical movements. The members of the original committee did not write a book on about the psychomotor domain.

More information

- [Learning Domains or Bloom's Taxonomy \(more info\)](#)
- [Benjamin Bloom publishes Taxonomy of Educational Objectives: The Classification of Educational Goals \(more info\)](#)
- [Krathwohl's Taxonomy of Affective Domain](#)

Definitions of the affective domain

The affective domain describes learning objectives that emphasize a feeling tone, an emotion, or a degree of acceptance or rejection. Affective objectives vary from simple attention to selected phenomena to complex but internally consistent qualities of character and conscience. We found a large number of such objectives in the literature expressed as interests, attitudes, appreciations, values, and emotional sets or biases. [from [Krathwohl et al, 1964](#)]

Here are descriptions of each step in the taxonomy, starting at the most basic level. (*From [Krathwohl's Taxonomy of Affective Domain](#)*)

Receiving: is being aware of or sensitive to the existence of certain ideas, material, or phenomena and being willing to tolerate them. Examples include: to differentiate, to accept, to listen (for), to respond to.

Responding: is committed in some small measure to the ideas, materials, or phenomena involved by actively responding to them. Examples are: to comply with, to follow, to commend, to volunteer, to spend leisure time in, to acclaim.

Valuing: is willing to be perceived by others as valuing certain ideas, materials, or phenomena. Examples include: to increase measured proficiency in, to relinquish, to subsidize, to support, to debate.

Organization: is to relate the value to those already held and bring it into a harmonious and internally consistent philosophy. Examples are: to discuss, to theorize, to formulate, to balance, to examine.

Characterization: by value or value set is to act consistently in accordance with the values he or she has internalized. Examples include: to revise, to require, to be rated high in the value, to avoid, to resist, to manage, to resolve.

What is the relevance of the affective domain in education?

If we are striving to apply the continuum of Krathwohl et al. to our teaching, then we are encouraging students to not just receive information at the bottom of the affective hierarchy. We'd like for them to respond to what they learn, to value it, to organize it and maybe even to characterize themselves as science students, science majors or scientists.

We are also interested in students' attitudes toward science, scientists, learning science and specific science topics. We want to find teaching methods that encourage students and draw them in. Affective topics in educational literature include attitudes, motivation, communication styles, classroom management styles, learning styles, use of technology in the classroom and nonverbal communication. It is also important not to turn students off by subtle actions or communications that go straight to the affective domain and prevent students from becoming engaged.

In the educational literature, nearly every author introduces their paper by stating that the affective domain is essential for learning, but it is the least studied, most often overlooked, the most nebulous and the hardest to evaluate of Bloom's three domains. In formal classroom teaching, the majority of the teacher's efforts typically go into the cognitive aspects of the teaching and learning and most of the classroom time is designed for cognitive outcomes. Similarly, evaluating cognitive learning is straightforward but assessing affective outcomes is difficult. Thus, there is significant value in realizing the potential to increase student learning by tapping into the affective domain. Similarly, students may experience affective roadblocks to learning that can neither be recognized nor solved when using a purely cognitive approach.

**Jackson Community College
Essentials of Sonography DMS 108
Affective Domain Evaluation Form #1**

Student:	
Evaluator:	
Date:	

Directions: Rate the performance on a scale of 1-4 utilizing the following criteria.

1 = UNACCEPTABLE PERFORMANCE

(Student demonstrates this skill less than 74% of the time)

2 = BELOW AVERAGE PERFORMANCE

(Student demonstrates this skill greater than 75% of the time)

3 = AVERAGE PERFORMANCE

(Student demonstrates this skill greater than 85% of the time)

4 = ABOVE AVERAGE PERFORMANCE

(Student demonstrates this skill greater than 95% of the time)

Initiative

Student demonstrates the ability to act independently and be self-motivated. This includes the following

	1. Takes advantage of all opportunities to scan.
	2. Takes the initiative to be involved in every learning opportunity.
	3. Accepts constructive criticism from instructors and students.
	4. Seeks to help others with challenging situations.
	5. Asks questions or volunteers information pertinent to their knowledge.
	Subtotal score (20 pts. Possible)

Interpersonal skills

Student demonstrates professionalism and empathy when others. This includes the following:

	1. Demonstrates appropriate communication others.
	2. Student demonstrates and maintains a positive attitude.
	3. Demonstrates patience for others
	4. Shows respect for the patient's modesty and dignity.
	5. Demonstrates concern for patients comfort.
	6. Communicates effectively and appropriately with others.
	Subtotal score (24 pts. Possible)

Professionalism

Student demonstrates professionalism when dealing with others. This includes the following:

	1. Behaves in a manner that promotes friendliness and cooperation
	2. Demonstrates eagerness to perform assigned tasks.
	3. Demonstrates a willingness to work with/for others to accomplish goals.
	4. Demonstrates an ability to communicate in an appropriate and constructive manner
	5. Demonstrates professionalism in attendance and conduct.
	Subtotal score (20 pts. Possible)

**Jackson Community College
Essentials of Sonography DMS 108
Affective Domain Evaluation Form #2**

Student:	
Evaluator:	
Date:	

Directions: Rate the performance on a scale of 1-4 utilizing the following criteria.

1 = UNACCEPTABLE PERFORMANCE

(Student demonstrates this skill less than 74% of the time)

2 = BELOW AVERAGE PERFORMANCE

(Student demonstrates this skill greater than 75% of the time)

3 = AVERAGE PERFORMANCE

(Student demonstrates this skill greater than 85% of the time)

4 = ABOVE AVERAGE PERFORMANCE

(Student demonstrates this skill greater than 95% of the time)

Initiative

Student demonstrates the ability to act independently and be self-motivated. This includes the following

	1. Takes advantage of all opportunities to scan.
	2. Takes the initiative to be involved in every learning opportunity.
	3. Accepts constructive criticism from instructors and students.
	4. Seeks to help others with challenging situations.
	5. Asks questions or volunteers information pertinent to their knowledge.
	Subtotal score (20 pts. Possible)

Interpersonal skills

Student demonstrates professionalism and empathy when others. This includes the following:

	1. Demonstrates appropriate communication others.
	2. Student demonstrates and maintains a positive attitude.
	3. Demonstrates patience for others
	4. Shows respect for the patient's modesty and dignity.
	5. Demonstrates concern for patients comfort.
	6. Communicates effectively and appropriately with others.
	Subtotal score (24 pts. Possible)

Professionalism

Student demonstrates professionalism when dealing with others. This includes the following:

	1. Behaves in a manner that promotes friendliness and cooperation
	2. Demonstrates eagerness to perform assigned tasks.
	3. Demonstrates a willingness to work with/for others to accomplish goals.
	4. Demonstrates an ability to communicate in an appropriate and constructive manner
	5. Demonstrates professionalism in attendance and conduct.
	Subtotal score (20 pts. Possible)

**Jackson Community College
Essentials of Sonography DMS 108
Affective Domain Evaluation Form #3 Final**

Student:	
Evaluator:	
Date:	

Directions: Rate the performance on a scale of 1-4 utilizing the following criteria.

1 = UNACCEPTABLE PERFORMANCE

(Student demonstrates this skill less than 74% of the time)

2 = BELOW AVERAGE PERFORMANCE

(Student demonstrates this skill greater than 75% of the time)

3 = AVERAGE PERFORMANCE

(Student demonstrates this skill greater than 85% of the time)

4 = ABOVE AVERAGE PERFORMANCE

(Student demonstrates this skill greater than 95% of the time)

Initiative

Student demonstrates the ability to act independently and be self-motivated. This includes the following

	1. Takes advantage of all opportunities to scan.
	2. Takes the initiative to be involved in every learning opportunity.
	3. Accepts constructive criticism from instructors and students.
	4. Seeks to help others with challenging situations.
	5. Asks questions or volunteers information pertinent to their knowledge.
	Subtotal score (20 pts. Possible)

Interpersonal skills

Student demonstrates professionalism and empathy when others. This includes the following:

	1. Demonstrates appropriate communication others.
	2. Student demonstrates and maintains a positive attitude.
	3. Demonstrates patience for others
	4. Shows respect for the patient's modesty and dignity.
	5. Demonstrates concern for patients comfort.
	6. Communicates effectively and appropriately with others.
	Subtotal score (24 pts. Possible)

Professionalism

Student demonstrates professionalism when dealing with others. This includes the following:

	1. Behaves in a manner that promotes friendliness and cooperation
	2. Demonstrates eagerness to perform assigned tasks.
	3. Demonstrates a willingness to work with/for others to accomplish goals.
	4. Demonstrates an ability to communicate in an appropriate and constructive manner
	5. Demonstrates professionalism in attendance and conduct.
	Subtotal score (20 pts. Possible)

What is Spatial Recognition Awareness?

Spatial Recognition Awareness

Spatial ability refers to an individual's capacity to visualize and mentally manipulate 3D objects. Since sonographers manually manipulate 2D and 3D sonographic images to generate multi-viewed logical, sequential renderings of an anatomical structure, it can be assumed that spatial ability is central to the perception and interpretation of these medical images. A significant relationship between the students' spatial ability scores and their scanning performance scores was found. This study suggests that the use of spatial ability tests for admission to sonography programs may improve student selection as well as assist programs in adjusting instruction and curriculum for students who demonstrate low spatial ability.

Visual-Spatial Ability

Visual-spatial ability refers to the neuro-psychological processing of spatial relations of image properties.¹ Furthermore, it is defined as the "ability to generate, retain, retrieve, and transform well-structured images. Complex in nature, it is not a unitary construct, but rather exists in several forms," with each emphasizing different aspects of the process of image generation, storage, retrieval, and transformation.² Sonographers create relationships among the sonography images produced and give meaning to the anatomical structures they see on sonographic images. However, they rarely see the entirety of the anatomical object being scanned. Therefore, sonographers must be able to construct a series of images that logically represents the whole object. This requires an ability to mentally rotate and transform 2D images and create a series of views that represents the 3D structure.

Improving Sonography: Spatial Ability Is Key to Becoming a Successful Sonographer, Study Finds

ScienceDaily (Oct. 16, 2010) — Diagnostic ultrasounds are the most widely used medical tests in the world. Though the technology is more than 50 years old, scientists continue to discover new uses for it, ranging from more targeted cancer treatments to liposuction. As the technology becomes more complex, a sonographer's skill level is even more important. Now, researchers at the University of Missouri may have found one of the keys to becoming a successful sonographer: spatial ability.

Doug Clem, clinical assistant professor of MU's diagnostic ultrasound program in the MU School of Health Professions, led the study of ultrasound students' spatial abilities. The study is the first to show how students' spatial abilities correlated to their results on scanning proficiency tests. Spatial ability is the ability to process and understand physical relationships among objects. This is important in sonography because ultrasounds are not like other medical tests, such as x-rays or CT scans. A sonographer cannot capture the entire object at once, but instead must collect a series of images and assemble them into a logical sequential order for a physician to read.

"It's operator dependent," said Sharlette Anderson, clinical instructor of MU's diagnostic ultrasound program. "I can scan the entire liver, but I'm not giving the radiologist images of every millimeter of the liver. I am giving him specific images and anything that I see that looks abnormal. If I miss an abnormality, the radiologist never sees it and the diagnosis is missed."

The study tested first-year ultrasound students' spatial abilities prior to any major coursework. Then, scientists tracked students' results on standard scanning proficiency tests over two semesters. Initially, the study showed little association between spatial ability and scanning proficiency. However, by the end of the academic year, students with greater spatial abilities were much more likely to have scored high on scanning tests.

Clem sees spatial ability tests as a potential consideration for admission to a sonography program. Currently, the program uses academic criteria like grade point average and ACT scores to evaluate undergraduate applications. Other professions, including dentistry and engineering, have used spatial ability testing for years. Spatial ability is affected by genetics, but recent research has shown that individuals can improve their spatial ability. Participating in certain hobbies, such as playing video games, working puzzles and other similar activities can encourage spatial ability development.

"Even though you may be a really strong academic student, you may not learn to scan as easily as other people might." Clem says. "Some of our best students, straight-A students, will need extra time or extra clinical time to get past their scanning competency tests. This poses a challenge for selecting the best candidates for admission, and we think that

spatial ability testing may turn out be one more piece of the puzzle that is needed to select the right individual."

The study was published in the *Journal of Diagnostic Medical Sonography*. Clem worked with Anderson and Moses Hdeib, director of the diagnostic ultrasound program. The team has started a second study, in cooperation with several universities, community colleges and proprietary schools from across the country. Through this larger study, Clem hopes to further validate the results of the first study by increasing the number of students observed. Depending on the results of the second study, the department will consider changing admission requirements next summer.

Story Source:

The above story is reprinted (with editorial adaptations by ScienceDaily staff) from materials provided by [University of Missouri-Columbia](#), via [Eur](#)

Student SWOT analysis I

Instructions:

For this assignment you will write a 2-3 page student SWOT analysis. Please organize your paper using the APA format. This paper should include supportive references (think of the affective domain, spatial ability tests, critical thinking) and responses to each category of the SWOT analysis.

Include the reference of the spatial ability test you completed

Objective:

The SWOT (Strengths, Weakness, Obstacles, Threats) analysis is a tool used to identify areas of strengths, natural abilities, and reveal where a student could be if the identified weaknesses and obstacles are eliminated. Additionally, the SWOT analysis will encourage students to take control of his or her educational goals.

Strengths:

What am I good at? What do others think I am good at? What do I enjoy doing? What areas am I competent in that are not just subject specific? (Think in wider terms of emotional and social intelligence too, skills identified in class) What subjects do I get good marks in? Are there particular learning styles that I lean towards? What have you identified from this course that your good at?(think about the skills you have learned so far) What did your spatial ability test reveal?

Weaknesses

Are there any specific subjects, skills or areas that I am weaker in (including multiple intelligences and emotional literacy, skills I struggle in this class)? Do I have any specific learning difficulties, eg dyslexia? What did your spatial ability test reveal?

Opportunities

How can I use my strengths to overcome my weakness? What strategies could I devise or use to appeal to my strengths and compensate for my weaknesses. What motivates me? How could I (or my teacher) make small adjustments to help me learn more effectively?

Threats

What makes me feel uncomfortable in class?(think of specific skills, spatial awareness, affective domain) What hinders me or stops me from learning? What de-motivates me

Student SWOT analysis II

Instructions:

For this assignment you will write a 2-3 page student SWOT analysis. Organize your paper using the APA format. Provide a comparison analysis from the beginning of class.(use the first SWOT analysis) What improved for you? What threats did you remove? What new strengths did you identify? This paper should include supportive references (think of the affective domain, spatial ability tests, critical thinking) and responses to each category of the SWOT analysis.

Include the reference of the spatial ability test you completed.

Objective:

The SWOT (Strengths, Weakness, Obstacles, Threats) analysis is a tool used to identify areas of strengths, natural abilities, and reveal where a student could be if the identified weaknesses and obstacles are eliminated. Additionally, the SWOT analysis will encourage students to take control of his or her educational goals.

Strengths:

What am I good at ? What do others think I am good at? What do I enjoy doing? What areas am I competent in that are not just subject specific? (Think in wider terms of emotional and social intelligence too, skills identified in class) What subjects do I get good marks in? Are there particular learning styles that I lean towards? What have you identified from this course that your good at?(think about the skills you have learned so far) What did your spatial ability test reveal?

Weaknesses

Are there any specific subjects, skills or areas that I am weaker in (including multiple intelligences and emotional literacy, skills I struggle in this class)? Do I have any specific learning difficulties, eg dyslexia? What did your spatial ability test reveal?

Opportunities

How can I use my strengths to overcome my weakness? What strategies could I devise or use to appeal to my strengths and compensate for my weaknesses. What motivates me? How could I (or my teacher) make small adjustments to help me learn more effectively?

Threats

What makes me feel uncomfortable in class?(think of specific skills, spatial awareness, affective domain) What hinders me or stops me from learning? What de-motivates me?

Scan Subject Release Form

I _____ give my permission to be a scan subject for the Jackson Community College Diagnostic Medical Sonography Program. I understand that if, while being scanned any questionable scan appearances are noted by the instructors, that I will seek my own medical service and advice as suggested by any DMS instructor.

I further release Jackson Community College of any responsibilities for any and all physical/mental conditions that may be believed to have resulted from any scanning session whereby I was utilized as a scan subject.

I further agree to monitor the time I was scanned and to complete accurate scan time reporting sheets as directed by the DMS instructor/s.

Signature _____ Date _____

Notes: