



BROWARD COLLEGE COURSE OUTLINE

LAST REVIEW: 2008-2009 **NEXT REVIEW:** 2013-2014 **STATUS:** A
(i.e. 2003-2004) *(i.e. 2008-2009)* *(A, I, D)*

COURSE TITLE: Practical Aspects of Sonography I

COMMON COURSE NUMBER: SON 1214

CREDIT HOURS: 3

CONTACT HOUR BREAKDOWN
(per 16 week term)

CLOCK HOURS:
(Voc. Course ONLY)

Lecture: 48 Lab:
Clinic: Other:

PREREQUISITE(S): SON 1100, SON 1170

COREQUISITE(S): SON 1111, SON 1121, SON 1211, SON 1804

PRE/COREQUISITE(S):

COURSE DESCRIPTION *(750 character smaximum)*: **A study of the principles of diagnostic ultrasound and practical aspects of scanning techniques, film critique, film identification and patient care and handling as related to sonographic examination. Stressing the operation of diagnostic ultrasound equipment and routine images obtained.**

General Education Requirements – Associate of Arts Degree (AA), meets Area(s): Area
General Education Requirements – Associate in Science Degree (AS), meets Area(s): Area
General Education Requirements – Associate in Applied Science Degree (AAS), meets Area(s): Area

UNIT TITLES

1. Basic Orientation and Terminology
2. Equipment Utilization
3. Image Identification and Evaluation
4. Patient Rapport and Medical Ethics
5. Abdominal Examination
6. Gynecological Examination
7. Obstetric Examination
8. Role of the Sonographer

ASSESSMENT:

Please provide a brief description (250 characters maximum) that details how students will be assessed on the course outcomes. **Quizzes, Assignments, Midterm and Final Exams. All Quizzes and Exams are Comprehensive**

**** Complete the following only if course is seeking general education status ****

GENERAL EDUCATION Competencies and Skills *:

Please highlight in green font all Competencies/Skills from the list below that apply to this course. In the box to the right of the Competency/Skill, enter all specific learning outcome numbers (i.e. 1.1, 2.7, 5.12) that apply.

1. Read with critical comprehension	
2. Speak and listen effectively	
3. Speak and listen effectively	
4. Think creatively, logically, critically, and reflectively (analyze, synthesize, apply, and evaluate)	
5. Demonstrate and apply literacy in its various forms: (highlight in green ALL that apply) (1. technological, 2. informational, 3. mathematical, 4. scientific, 5. cultural, 6. historical, 7. aesthetic and/or 8. environmental)	
6. Apply problem solving techniques to real-world experiences	
7. Apply methods of scientific inquiry	
8. Demonstrate an understanding of the physical and biological environment and how it is impacted by human beings	
9. Demonstrate an understanding of and appreciation for human diversities and commonalities	
10. Collaborate with others to achieve common goals.	
11. Research, synthesize and produce original work	
12. Practice ethical behavior	
13. Demonstrate self-direction and self motivation	
14. Assume responsibility for and understand the impact of personal behaviors on self and society	
15. Contribute to the welfare of the community	

* General Education Competencies and Skills endorsed by '05-'06 General Education Task Force

Common Course Number: SON 1214

UNITS

Unit 1 Basic Orientation and Terminology

General Outcome:

- 1.0 The student shall:** demonstrate an understanding of the basics of sonographic equipment utilization and terminology used in sonographic imaging.

Specific Measurable Learning Outcomes:

Upon successful completion of this unit, the student shall be able to:

- 1.1 Define the terms associated with routine ultrasound scanning
- 1.2 Explain plane anatomy
- 1.3 Explain the standard orientation of ultrasound images in terms of reference points, superior, inferior, left and right, medial and lateral structures.
- 1.4 Demonstrate on a T.V. monitor the standard orientations in the different planes
- 1.5 Demonstrate proper positioning of the patient for routine sonographic examinations
- 1.6 Identify images on T.V. monitor and film in terms of standard orientation
- 1.7 Distinguish between hypoechoic, hyperechoic, anechoic structures on ultrasound images
- 1.8 Describe factors that influence demonstration of various degrees of echogenicity
- 1.9 Place the transducer in the correct orientation to patient for the exam being performed
- 1.10 Utilize safety precautions in using ultrasound equipment
- 1.11 Describe and demonstrate the conditions affecting sound transmission such as the attenuation factors
- 1.12 Explain and use the various types of scanning movements required to produce diagnostic quality sonograms
- 1.13 Recall the role of the American Registry of Diagnostic Medical Sonographers (A.R.D.M.S.) in credentialing general sonographers, cardiac sonographers and vascular sonographers
- 1.14 Explain the role of the S.D.M.S. as a professional organization and relate the importance of sonographer participation in professional organizations
- 1.15 Comprehend and employ appropriate medical terminology, abbreviations, terms and phrases
- 1.16 Educate other health care providers and the public in the appropriate application of ultrasound/noninvasive diagnostic vascular evaluation, including:
 - a. medical terminology
 - b. sonographic/other noninvasive diagnostic vascular terminology
 - c. pertinent clinical signs, symptoms, and laboratory tests
 - d. pertinent legal principles

Common Course Number: SON 1214

UNITS

Unit 2 Equipment Utilization

General Outcome:

- 2.0 The student shall:** demonstrate an understanding of the basics of sonographic instrumentation and safety

Specific Measurable Learning Outcomes:

Upon successful completion of this unit, the student shall be able to:

- 2.1** Select the correct transducer for the exam
- 2.2** Set up the machine for the exam requested
- 2.3** Describe and demonstrate the correct use of gain, range, slope, etc., in obtaining optimum sonograms
- 2.4** Distinguish between power controls and gain controls and determine when each should be used for optimum sonograms and patient safety
- 2.5** Demonstrate knowledge of biological effects of ultrasound
 - a. explain the thermal index (TI) and the rationale for displaying it
 - b. explain the mechanical index (MI) and the rationale for displaying it
- 2.6** Use the keyboard to record proper patient identification information
- 2.7** Demonstrate proficiency in changing probes
- 2.8** Demonstrate proper use of arrow keys and joystick
- 2.9** Demonstrate knowledge of proper use of image processing curves
- 2.10** Describe characteristics of the field of view as related to resolution and attenuation
- 2.11** Demonstrate use of the magnification, right/left invert and black/white invert function
- 2.12** Demonstrate proficiency in use of measurement functions
- 2.13** Appreciate the need for measures to take care of the ultrasound equipment

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UNITS

Unit 3 Image Identification and Evaluation

General Outcome:

- 3.0 The student shall:** demonstrate an understanding of routine images obtained of normal anatomy and normal Doppler patterns.

Specific Measurable Learning Outcomes:

Upon successful completion of this unit, the student shall be able to:

- 3.1** Describe and demonstrate routine documentation associated with a typical ultrasound department
- 3.2** Demonstrate recognition of normal anatomy and Doppler patterns, including the following:
- a. gross sectional anatomy
 - b. embryology
 - c. normal sonographic patterns
 - d. normal Doppler patterns associated with high and low resistance arterial flow, and normal Doppler patterns of venous flow
- 3.3** Name factors which affect resolution
- 3.4** Evaluate anatomical structures in the region of interest and demonstrate structures on films and T.V. monitor
- a. structure is shown in proper perspective
 - b. correct parameter is demonstrated to demonstrate anatomy desired
 - c. patient is positioned properly
 - d. correct technique is utilized for maximum demonstration of part of interest
- 3.5** Demonstrate knowledge of permanent image recording and processing
- 3.6** Demonstrate ability to achieve the greatest reduction of "noise" without impairment of scan
- 3.7** Identify patient information and special labeling on image

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UNITS

Unit 4 Patient Rapport and Medical Ethics**General Outcome:**

4.0 The student shall: demonstrate an understanding of medical ethics and patient-sonographer interaction.

Specific Measurable Learning Outcomes:

Upon successful completion of this unit, the student shall be able to:

- 4.1 Define the role of the sonographer in relationship to the radiologist and the patient
- 4.2 Match sonographic procedures with patient preparation needed for examination
- 4.3 Demonstrate ability to determine and record the patient's history
- 4.4 Understand the medical ethics involved in sonography and adhere to the professional codes of conduct/ethics through the following:
 - a. medical ethics
 - b. pertinent legal principles
 - c. professional interaction skills
 - d. professional scope of practice
- 4.5 Demonstrate knowledge of personal skills and qualifications of a sonographer in terms of courtesy and professional conduct in working with patients
- 4.6 Demonstrate communication skills required on a daily basis in the typical sonography setting
- 4.7 Demonstrate knowledge of patient care and handling in routine and in emergency situations
- 4.8 Demonstrate ability to maintain clinical records
- 4.9 Recognize significant clinical information and historical facts from the patient and the medical records which may impact on the diagnostic examination
- 4.10 Interact with the interpreting physician or other designated physician with oral or written summary of findings as permitted by employer policy and procedure
- 4.11 Employ professional judgment and discretion
- 4.12 Protect the patient's right to privacy and confidentiality
- 4.13 Perform within the Scope of Practice

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UNITS

Unit 5 Abdominal Examination

General Outcome:

- 5.0 The student shall:** demonstrate an understanding of routine sonographic procedures associated with normal abdominal structures.

Specific Measurable Learning Outcomes:

Upon successful completion of this unit, the student shall be able to:

- 5.1** Explain the normal preparations for the sonographic demonstration of the upper abdominal organs
- 5.2** Explain the protocol for scanning the upper abdominal organs
- 5.3** Demonstrate and/or draw diagrams related to the normal anatomy of the upper abdomen
- 5.4** Assess abdominal anatomy and identify gross abdominal structures as demonstrated by ultrasound, such as the liver, gallbladder, aorta and its branches, the IVC stomach, bowel, pancreas, kidneys and spleen
- 5.5** Distinguish abdominal organs location and size
- 5.6** Perform positioning and scanning procedures for the liver and vascular structures
- 5.7** Perform positioning and scanning procedures for the kidneys, adrenals, retroperitoneum and vascular structures
- 5.8** Perform positioning and scanning procedures for the prevertebral vessels
- 5.9** Perform positioning and scanning procedures for the gallbladder and biliary tract
- 5.10** Perform positioning and scanning procedures for the pancreas
- 5.11** Perform positioning and scanning procedures for the spleen
- 5.12** Obtain and evaluate pertinent patient history and physical findings

Common Course Number: SON 1214

UNITS

Unit 6 Gynecological Examination

General Outcome:

- 6.0 The student shall:** demonstrate an understanding of routine sonographic procedures associated with scanning the normal non-pregnant female.

Specific Measurable Learning Outcomes:

Upon successful completion of this unit, the student shall be able to:

- 6.1** Describe the normal anatomy and scanning techniques used to demonstrate the female pelvis
- 6.2** Explain the protocol for scanning the female pelvis
- 6.3** Identify and assess pelvic anatomy on the T.V. monitor and film
- 6.4** Distinguish uterus location, position and size
- 6.5** Identify ovarian location, position and size
- 6.6** Identify other adnexal and vascular structures
- 6.7** Demonstrate knowledge of all preliminary procedures leading to actual examination
- 6.8** Describe the technique for preparing the probe for a transvaginal exam

Common Course Number: SON 1214

UNITS

Unit 7 Obstetric Examination

General Outcome:

7.0 The student shall: demonstrate an understanding of routine sonographic procedures associated with scanning the obstetric patient

Specific Measurable Learning Outcomes:

Upon successful completion of this unit, the student shall be able to:

- 7.1** Draw a diagram of the crown-rump length measurement
- 7.2** Describe the measurement of a gestational sac
- 7.3** Describe proper routine measurements for the first trimester pregnancy
- 7.4** Describe and/or draw diagrams of the routine measurements taken in a second and third trimester pregnancy
- 7.5** Describe the technique to determine fetal lie
- 7.6** Describe the technique used to locate the placenta
- 7.7** Describe the methods used to determine fetal viability and well-being

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UNITS

Unit 8 Role of the Sonographer

General Outcome:

- 8.0 The student shall:** demonstrate an understanding of role and duties of the sonographer in the operation of equipment, patient care and should be able to follow a given exam protocol.

Specific Measurable Learning Outcomes:

Upon successful completion of this unit, the student shall be able to:

- 8.1** Demonstrate personal skills and qualifications of a sonographer.
- 8.2** Demonstrate the correct usage of the ultrasound equipment.
- 8.3** Demonstrate proper imaging and scanning techniques for general exam protocols.
- 8.4** Demonstrate communication skills required to be an effective participant in the health care system.
- 8.5** Recognize the importance of, and employ, ergonomically correct scanning techniques.