



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 II

COMMON COURSE NUMBER: SON1215

CREDIT HOURS: 3

CONTACT HOUR BREAKDOWN

(per 16 week term)

CLOCK HOURS:

(Voc. Course ONLY)

Lecture: 48

Lab:

Clinic:

Other:

PREREQUISITE(S): SON1100, SON1170, SON1211, SON1111, SON 1121, SON 1214, SON1804

COREQUISITE(S): SON1212, SON1112, SON1122, SON1814

PRE/COREQUISITE(S):

COURSE DESCRIPTION *(750 character smaximum)*: Offering more advanced principles of diagnostic ultrasound, adding knowledge of pathological processes. Further presenting the practical aspects of scanning techniques, film critique, film identification and patient care and handling as related to sonographic examination. Stressing the correlation of all patient data, including sonographic images obtained to assist in the differential diagnosis process.

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. General Orientation and Terminology
2. Equipment Utilization
3. Image Identification and Evaluation
4. Patient Rapport and Medical Ethics
5. Abdominal Examination
6. Gynecological and Obstetrical Examination
7. 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, Exams, - Midterm and Final – all comprehensive. Attendance is required for successful completion, Case studies are required

**** 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: SON1215

UNITS

Unit 1 General Orientation and Terminology

General Outcome:

- 1.0 The student shall:** demonstrate an understanding of scanning techniques and procedures used in a routine sonographic department.

Specific Measurable Learning Outcomes:

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

- 1.1** Define the terms associated with pathological states of the general abdomen and female reproductive system
- 1.2** Demonstrate appropriate planes, orientations, and scanning motions utilized for routine sonographic exams
- 1.3** Explain the role of the gain controls in sound transmission and attenuation in normal and pathological states
- 1.4** Demonstrate on diagrams and/or sonograms the standard views obtained in routine abdomen and pelvic examinations
- 1.5** Demonstrate proper positioning of the patient for routine sonographic examinations
- 1.6** Distinguish between normal and abnormal anatomy and vasculature on sonograms, and normal and abnormal blood flow patterns on Doppler spectral displays and/or color-flow images
- 1.7** Demonstrate techniques to distinguish between hypoechoic, hyperechoic, anechoic structures on ultrasound images
- 1.8** Demonstrate understanding of acquiring patient information, i.e., history, lab data, clinical signs, etc., to correlate with sonographic images
- 1.9** Describe safety precautions to be utilized in using ultrasound equipment
- 1.10** Demonstrate the various types of scanning movements required to produce diagnostic quality sonograms
- 1.11** Outline the broad features of ultrasound as a medical diagnostic tool
- 1.12** Contrast ultrasound with other imaging and investigative technologies such as X-rays, Magnetic resonance imaging, and radionuclides

- 1.13** Recognize the importance of continuing education through the following:
 - a. professional journals
 - b. conferences
 - c. lectures
 - d. in-house educational offerings
 - e. professional organizations and resources
 - f. recent developments in sonography
 - g. research, statistics and design

- 1.14** Understand the policies, protocols and procedures for the general ultrasound function of the ultrasound laboratory, including the following:
 - a. administrative procedures
 - b. quality control procedures
 - c. elements of quality assurance program
 - d. records maintenance
 - e. personnel and fiscal management
 - f. trends in health care systems

- 1.15** Demonstrate recognition of examination findings that require immediate clinical response, and demonstrate knowledge of when to notify the interpreting physician of such findings

- 1.16** Demonstrate understanding of pertinent legal issues

- 1.17** Review data from current and previous examinations to produce a written/oral summary of technical findings, including relevant interval changes, for the interpreting physician's reference.

- 1.18** Demonstrate ability to identify life-threatening situations and implement emergency care as permitted by affiliate procedure, including the following:
 - a. infection control and universal precaution procedures
 - b. pertinent patient care procedures
 - c. principles of psychological support
 - d. emergency conditions and procedures
 - e. first aid and resuscitation techniques

Common Course Number: SON1215

UNITS

Unit 2 Equipment Utilization

General Outcome:

- 2.0 The student shall:** demonstrate an understanding of various modes of display and instrumentation utilized in sonographic examination.

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 and explain the reason(s) for the choice
- 2.2** Describe a multi-element transducer probe
- 2.3** Describe the methods used to focus a sound beam
- 2.4** Describe and/or recognize on a sonogram or picture the A-mode display
- 2.5** Describe and/or recognize on a sonogram the B-mode display
- 2.6** Outline schematically the various ultrasound and Doppler instruments and indicate the role and action of each functional block in the devices
- 2.7** Describe and demonstrate instrument performance tests
- 2.8** Demonstrate understanding of the need for implementing a quality assurance program
- 2.9** Critically review the application of the various imaging and Doppler modes in the clinical setting
- 2.10** Demonstrate knowledge of proper use of image processing options. i.e., preprocessing and postprocessing
- 2.11** Appreciate the need for measures to take care of the ultrasound equipment
- 2.12** Demonstrate understanding of biological effects publications, and the importance of minimizing patient exposure to acoustic energy

Common Course Number: SON1215

UNITS

Unit 3 Image Identification and Evaluation

General Outcome:

3.0 The student shall: demonstrate an understanding of sonographic documentation of normal and abnormal states.

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 pathological states vs. normal anatomy
- 3.3** Describe the principal artifacts that can occur in sonographic imaging and discuss how they may be eliminated or their effects minimized.
- 3.4** Demonstrate anatomical parts on films or other hard-copy sonograms and evaluate structures of interest
 - a. structure is shown in proper perspective
 - b. structure is centered and target area is demonstrated to best advantage for that particular exam
 - c. patient is positioned properly
 - d. correct technique is utilized for maximum demonstration of structure of interest
 - e. optimal scanning planes and orientation and scanning motion are demonstrated
 - f. pertinent measurements are obtained or identified
- 3.5** Demonstrate knowledge of permanent image recording and processing
- 3.6** Demonstrate ability to achieve the greatest reduction of "noise" and other artifacts without impairment of scan
- 3.7** Recognize, explain, and/or minimize acoustic artifacts
- 3.8** Relate those artifacts that are "useful" in ultrasound imaging

Common Course Number: SON1215

UNITS

Unit 4 Patient Rapport and Medical Ethics

General Outcome:

- 4.0 The student shall:** demonstrate an advanced 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** Through role play, demonstrate the role of the sonographer in interacting with the patient and the radiologist
- 4.2** Instruct the patient in correct preparation needed for examination
- 4.3** Demonstrate ability to determine and record the patient's history and correlate history, lab data, etc. with sonographic findings
- 4.4** Understand the medical ethics involved in sonography
- 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** Obtain and evaluate pertinent patient history and physical findings
- 4.8** Extend standard diagnostic testing protocol as required by patient history or initial findings

Common Course Number: SON1215

UNITS

Unit 5 Abdominal Examination

General Outcome:

- 5.0 The student shall:** demonstrate an understanding of the sonographic procedures associated with scanning normal and abnormal abdominal structures.

Specific Measurable Learning Outcomes:

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

- 5.1** Explain the reasons for the usual preparations for the sonographic demonstration of the upper abdominal organs
- 5.2** Explain the protocol for scanning the upper abdominal organs
- 5.3** Explain ways to modify protocol as indicated by patient history or initial sonographic findings
- 5.4** Demonstrate the normal anatomy of the upper abdomen and distinguish normal structures from abnormal
- 5.5** 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
- 5.6** Distinguish abdominal organs location, size and echogenicity
- 5.7** Utilize case studies to evaluate the patient, correlating all available information such as history, clinical findings, lab data, other diagnostic studies, sonographic data, blood flow information, etc., and discuss the medical ethics of individual cases

Common Course Number: SON1215

UNITS

Unit 6 Gynecological and Obstetrical Examination

General Outcome:

- 6.0 The student shall:** demonstrate an understanding of the procedures associated with the sonographic examination of the normal and abnormal female pelvis in the non-pregnant patient and in the pregnant patient.

Specific Measurable Learning Outcomes:

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

- 6.1** Distinguish normal anatomy from pathological states
- 6.2** Explain the advantages and disadvantages of transvaginal scanning techniques and transabdominal scanning techniques
- 6.3** Identify and assess pelvic structures, normal and abnormal on hard copy sonograms
- 6.4** Distinguish normal from pathological structures associated with the uterus
- 6.5** Distinguish normal from pathological structures associated with the ovaries
- 6.6** Identify other adnexal structures
- 6.7** Discuss potential legal implications of intracavitary scanning
- 6.8** Utilize case studies to evaluate the patient, correlating all available information including history, clinical findings, lab data, other diagnostic studies, etc., and discuss the medical ethics associated with individual cases
- 6.9** Describe all procedures associated with sonographic examination of the pregnant patient
- 6.10** Identify on diagrams, films videotape or other presentations, fetal structures and distinguish normal from abnormal
- 6.11** Demonstrate knowledge associated with scanning the abnormal pregnancy

Common Course Number: SON 1215

UNITS**Unit 7 Role of the Sonographer****General Outcome:**

- 7.0 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:

- 7.1 Demonstrate personal skills and qualifications of a sonographer.
- 7.2 Demonstrate the correct usage of the ultrasound equipment.
- 7.3 Demonstrate proper imaging and scanning techniques for general exam protocols.
- 7.4 Demonstrate communication skills required to be an effective participant in the health care system.
- 7.5 Recognize the importance of, and employ, ergonomically correct scanning techniques.