

LAST REVIEW: 2008-2009 **NEXT REVIEW:** 2013-2014 **STATUS:** A
2007-2008 2012-2013 A

COURSE TITLE: Principles and Protocols of Sonography

COMMON COURSE NUMBER: SON1100

CREDIT HOURS: 3

CONTACT HOUR BREAKDOWN
(per 16 week term)

CLOCK HOURS:
(Voc. Course ONLY)

Lecture: 48 Lab:
Clinic: Other:

PREREQUISITE(S): Program Admission

COREQUISITE(S): SON1170

PRE/COREQUISITE(S):

COURSE DESCRIPTION (750 character smaximum): **An Introduction to the basic approaches to sonographic scanning and scanning protocols for the abdomen and pelvis**

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
2. Scanning Planes
3. Overview of Abdominal Scanning Protocols
4. Overview of Pelvic Scanning Protocols
5. Overview of Obstetrical Scanning Protocols
6. Overview of Scanning Protocols for Superficial Structures
7. Overview of Basic Protocols for Peripheral Vascular Scanning
8. Role and Duties of Sonographer

ASSESSMENT:

Please provide a brief description (250 characters maximum) that details how students will be assessed on the course outcomes. **Quizzes, Exams, Laboratory Practice and observation of cognitive, psychomotor and affective behavior/skills.**

**** 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:

UNITS

Unit 1 General

General Outcome:

- 1.0 The student shall:** demonstrate understanding of clinical skills related to preparing the patient for sonographic exam and the scanning survey.

Specific Measurable Learning Outcomes:

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

- 1.1 Assist patients to and from the exam area
- 1.2 Explain the methods for identifying the patient
- 1.3 Explain the examination and instruct the patient properly
- 1.4 Describe a scanning survey and explain the importance of a survey prior to taking images
- 1.5 Explain the selection of the proper transducer for the exam
- 1.6 Demonstrate knowledge of film cassettes and camera operation
- 1.7 Explain the elements of film labeling
- 1.8 Describe optimal techniques related to field size, power, gain, and contrast for interpretable images
- 1.9 Demonstrate knowledge of presenting films in a logical sequence, justifying techniques and procedures used

Common Course Number: SON1110

UNITS

Unit 2 Scanning planes

General Outcome:

2.0 The student shall: describe standard scanning planes and transducer approaches

Specific Measurable Learning Outcomes:

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

- 2.1 Define plane (planar) anatomy
- 2.2 Define sagittal plane of the body
- 2.3 Define transverse plane of the body
- 2.4 Define coronal plane of the body
- 2.5 Identify the anatomic specifics of a sagittal plane - anterior or posterior approach (anterior, posterior, superior, inferior)
- 2.6 Identify the anatomic specifics of a transverse plane - anterior or posterior approach (anterior, posterior, right lateral, left lateral)
- 2.7 Identify the anatomic specifics of a coronal plane - right or left approach (medial, lateral, superior, inferior)
- 2.8 Discuss organ oriented scanning
- 2.9 Explain the following transducer positions/motions:
 - a. perpendicular
 - b. angled
 - c. intercostal
 - d. subcostal
 - e. sliding; rocking
- 2.10 Describe the following patient positions
 - a. supine
 - b. prone
 - c. right lateral decubitus
 - d. left lateral decubitus
 - e. right posterior oblique
 - f. left posterior oblique
- 2.11 Describe the most basic protocol for scanning and labeling pathology

Common Course Number: SON1100

UNITS

Unit 3 Overview of Abdominal scanning protocols

General Outcome:

3.0 The student shall: explain the basic protocol for abdominal organ and general abdomen sonographic scanning

Specific Measurable Learning Outcomes:

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

- 3.1 Explain the need for specific exam protocols
- 3.2 Explain the rationale for beginning with a survey
- 3.3 Describe the protocol for abdominal aorta scanning
- 3.4 Explain what images are required for an aorta examination
- 3.5 Identify a normal aorta on a sonogram, and determine the scanning plane used
- 3.6 Describe the protocol for imaging the inferior vena cava
- 3.7 Explain what images are needed for scanning the inferior vena cava
- 3.8 Identify a normal inferior vena cava on a sonogram, and determine the scanning plane used
- 3.9 Distinguish between the aorta and inferior vena cava on a sonographic image
- 3.10 Explain the protocol for liver scanning
- 3.11 Describe the images required for scanning the liver
- 3.12 Explain the approaches used for imaging the liver
- 3.13 Explain the required pictures for a liver examination
- 3.14 Identify the scanning plane and anatomical parts of the liver represented on a sonogram
- 3.15 Explain the protocol for scanning the gallbladder and biliary tract
- 3.16 Describe the images required for scanning the gallbladder and biliary ducts
- 3.17 Explain the approaches used for imaging the gallbladder and biliary tract
- 3.18 Explain the required pictures for a gallbladder and biliary examination
- 3.19 Identify the scanning plane and anatomical parts of the gallbladder and biliary system represented on a sonogram
- 3.20 Explain the protocol for scanning the pancreas
- 3.21 Describe the images required for an examination of the pancreas
- 3.22 Explain the approaches used for imaging the pancreas
- 3.23 Explain the required pictures for a pancreas examination
- 3.24 Identify the scanning plane and anatomical parts of the pancreas represented on a sonogram

- 3.25 Explain the protocol for renal and adrenal scanning
- 3.26 Describe the images required for scanning the kidney
- 3.27 Explain the approaches used for imaging the kidney and adrenals
- 3.28 Explain the required pictures for a renal examination
- 3.29 Identify the scanning plane and anatomical parts of the kidneys represented on a sonogram
- 3.30 Explain the protocol for spleen scanning
- 3.31 Describe the images required for scanning the spleen
- 3.32 Explain the approaches used for imaging the spleen
- 3.33 Explain the required pictures for a spleen examination
- 3.34 Identify the scanning plane and anatomical parts of the spleen represented on a sonogram

Common Course Number: SON1100

UNITS

Unit 4 Overview of pelvic scanning protocols

General Outcome:

- 4.0 The student shall:** describe standard scanning protocols for scanning the non-pregnant female pelvis and the male pelvis

Specific Measurable Learning Outcomes:

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

- 4.1 Describe a survey of pelvis structures
- 4.2 Explain the need for verbal or written consent for endocavitary studies
- 4.3 Explain what is meant by an acoustic window
- 4.4 Explain the protocol for scanning the female pelvis
- 4.5 Describe the images required for scanning the uterus and pelvic cavity
- 4.6 Explain the approaches used for imaging the uterus
- 4.7 Explain the required pictures for a female pelvis examination
- 4.8 Describe the images required for imaging the ovaries
- 4.9 Explain the approaches used for imaging the ovaries
- 4.10 Identify the scanning plane and anatomical parts of the female pelvis represented on a sonogram
- 4.11 Explain the advantages of endovaginal sonography
- 4.12 Describe the advantages of transabdominal sonography of the pelvis
- 4.13 Explain the orientation of endovaginal images
- 4.14 Identify the scanning plane represented on a sonogram obtained endovaginally
- 4.15 Identify the structures represented on a sonogram obtained endovaginally
- 4.16 Explain the protocol for scanning the male pelvis
- 4.17 Explain the approaches used for imaging the prostate gland
- 4.18 Identify the scanning plane and general anatomy of the male pelvic structures

Common Course Number: SON1100

UNITS

Unit 5 Overview of Obstetrical Scanning Protocol

General Outcome:

5.0 The student shall: describe the basic scanning protocols related to examination of the obstetrical patient in the first, second and third trimesters

Specific Measurable Learning Outcomes:

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

- 5.1** Describe a survey of the uterus and adnexa in the pregnant female
 - a. first trimester
 - b. second and third trimester
- 5.2** Describe a fetal survey
- 5.3** Describe uses of intracavitary transducers
- 5.4** Describe the protocol for scanning the first trimester obstetrical patient
- 5.5** Explain the required pictures for a first trimester obstetrical study
- 5.6** Explain the approaches used for scanning in the first trimester
- 5.7** Identify the scanning plane and anatomical parts of the obstetric patient represented on a sonogram
- 5.8** Identify the scanning plane and structures associated with the gestational sac, embryo or fetus in the first trimester represented on a sonogram
- 5.9** Identify the fetal and maternal structures associated with a second and third trimester pregnancy represented on a sonogram

Common Course Number: SON1110

UNITS

Unit 6 Overview of Scanning Protocols for Superficial structures

General Outcome:

6.0 The student shall: describe the basic scanning protocols related to scanning superficial structures/small parts

Specific Measurable Learning Outcomes:

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

- 6.1** Describe the purpose of high-resolution transducers
- 6.2** Discuss the use of a water-path or stand-off pad scanning technique
- 6.3** Describe the patient position and scanning protocol for sonographic imaging of the thyroid gland
- 6.4** Identify on a sonogram the scanning plane and anatomy of the thyroid gland
- 6.5** Describe the patient position and scanning protocol for sonographic imaging of the scrotum
- 6.6** Identify on a sonogram the scanning plane and anatomy of the testis
- 6.7** Describe the scanning protocol for sonographic imaging of the breast
- 6.8** Explain the clinical reasoning for breast sonography
- 6.9** Describe the labeling procedure for examination of the breast

Common Course Number: SON1100

UNITS

Unit 7 Overview of Basic Protocols for Peripheral Vascular Scanning

General Outcome:

- 7.0 The student shall:** describe the protocols for scanning the peripheral vascular structures typically imaged in a general sonography department

Specific Measurable Learning Outcomes:

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

- 7.1** Define Duplex scanning
- 7.2** Describe the basic protocol for scanning the popliteal artery
- 7.3** Describe the basic protocol for scanning the carotid arteries
- 7.4** Identify the carotid artery and jugular vein on a sonogram
- 7.5** Identify the plane of scan and anatomic structures demonstrated when viewing an image of the carotid artery
- 7.6** Define the role of sonography in peripheral venous scanning
- 7.7** Describe the basic protocol for scanning the lower extremities
- 7.8** Identify the scanning plane and anatomical structures represented on a sonogram of the lower extremity venous and arterial system

Common Course Number: SON1100

UNITS

Unit 8 Overview of Basic Protocols for Peripheral Vascular Scanning

General Outcome:

8.0 **The student shall** demonstrate an understanding of the 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.