



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: Abdomen Sonography I

COMMON COURSE NUMBER: SON 1111

CREDIT HOURS: 3

CONTACT HOUR BREAKDOWN

(per 16 week term)

CLOCK HOURS:

(Voc. Course ONLY)

Lecture: **48** Lab:

Clinic: Other:

PREREQUISITE(S): SON1100, SON1170

COREQUISITE(S): SON1121, SON1211, SON1214 and SON 1804

PRE/COREQUISITE(S):

COURSE DESCRIPTION *(750 character maximum)*: An introduction to the cross-sectional anatomy of abdominal area and its recognition on sonographic visualization systems.

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. Vascular System
3. The Liver
4. Gallbladder and Biliary
5. Pancreas
6. Renal
7. Adrenal Glands
8. Spleen
9. Retroperitoneum

ASSESSMENT:

Please provide a brief description (250 characters maximum) that details how students will be assessed on the course outcomes. Quizzes, Midterm and Final Exams – all are comprehensive tests.

**** 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 1111

UNITS

Unit 1 General

General Outcome:

- 1.0 The student shall:** be able to demonstrate an understanding of gross abdominal anatomy, physiology, laboratory tests, and sonographic anatomy

Specific Measurable Learning Outcomes:

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

- 1.1** Draw and label the gross upper abdominal organs and vascular structures in both the longitudinal and transverse dimensions
- 1.2** Identify the gross upper abdominal anatomy as demonstrated by sonography and common anatomic drawings
- 1.3** Explain the physiology and circulatory patterns of the upper abdominal organs and the related lab examinations
- 1.4** Explain scanning techniques associated with obtaining general abdomen sonograms
- 1.5** Recognize the sonographic appearance of normal abdominal structures, including anatomic variants and normal Doppler patterns associated with:
 - a. organs
 - b. vasculature
 - c. supporting structures
 - d. peritoneal cavity and potential spaces
 - e. anterior and posterior abdominal wall
 - f. gastrointestinal tract

Common Course Number: SON 1111

UNITS

Unit 2 Vascular System

General Outcome:

- 2.0 The student shall:** be able to demonstrate an understanding of advanced anatomy and physiology of the abdominal vascular system

Specific Measurable Learning Outcomes:

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

- 2.1 Define the origin of the aorta and vena cava.
- 2.2 Diagram the path of the aorta and inferior vena cava in detail.
- 2.3 Describe at least four main tributaries of the inferior vena cava and their origin.
- 2.4 Describe at least four main tributaries of the aorta, their circulation and their origin relative to the sections of the aorta.
- 2.5 Diagram the distribution of the main vessels to the viscera and mesentery.
- 2.6 Describe in detail the hepatic portal circulation.
- 2.7 Describe the origin, circulation and path of the following venous structures:
 - A. splenic vein
 - B. superior mesenteric vein
 - C. inferior mesenteric vein
 - D. portal vein
 - E. hepatic vein
 - F. renal veins
 - G. suprarenal veins
 - H. lumbar veins
 - I. azygos vein
- 2.8 Describe the origin, circulation and path of the following arteries:
 - A. celiac trunk
 - a. hepatic artery
 - 1) gastroduodenal artery
 - 2) cystic artery
 - b. left gastric artery
 - c. splenic artery
 - B. superior mesenteric artery
 - C. inferior mesenteric artery
 - D. renal arteries
- 2.9 Recognize the normal sonographic appearance of the vascular anatomy.
- 2.10 Explain scanning techniques associated with obtaining sonograms of the vascular structures in the abdomen
- 2.11 Describe techniques for Doppler evaluation of the vessels in the abdomen
- 2.12 Recognize normal spectral waveforms, color-flow and amplitude Doppler patterns associated with the hemodynamics of abdominal vasculature

Common Course Number: SON 1111

UNITS

Unit 3 The Liver**General Outcome:**

3.0 The student shall: demonstrate an understanding of advanced gross and sonographic anatomy and physiology of the liver.

Specific Measurable Learning Outcomes:

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

- 3.1 Describe the location and size of the liver.
- 3.2 Describe in detail the segmental anatomy of the liver.
- 3.3 Identify the sonographic landmarks for the segmental anatomy of the liver.
- 3.4 Describe the position, size, and boundaries of the four anatomical (traditional) lobes of the liver.
- 3.5 Explain the location, shape, and function of the four fossae of the liver.
- 3.6 Describe the formation and tracks of the vascular and biliary structures of the liver.
- 3.7 Illustrate the surface and internal anatomy of the liver and adjacent structures in cross-section.
- 3.8 Explain the appearance, frequency, and significance of congenital anomalies (i.e. Reidel's lobe).
- 3.9 Explain the functions for which the liver is responsible.
- 3.10 Select the pertinent laboratory and other diagnostic tests for liver evaluation.
- 3.11 Recognize the normal sonographic patterns and appearance of the liver.
- 3.12 Explain scanning techniques and Doppler applications associated with obtaining sonographic examination of the liver and its' vasculature

Common Course Number: SON 1111

UNITS

Unit 4 Gallbladder and Biliary System

General Outcome:

- 4.0 The student shall:** demonstrate an understanding of advanced gross and sonographic anatomy and physiology of the gallbladder

Specific Measurable Learning Outcomes:

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

- 4.1** Describe the internal and surface anatomy, size and position by recognizing the normal sonographic pattern of the:
- A. gallbladder
 - B. cystic duct
 - C. hepatic ducts
 - D. common bile duct
 - E. vaterian system
 - F. related arterial, venous and lymphatic systems
- 4.2** Illustrate the cross-sectional anatomy of the hepatobiliary system and adjacent structures.
- 4.3** Describe congenital anomalies that affect the gallbladder, hepatic, cystic and common bile ducts.
- 4.4** Explain production, composition and function of bile.
- 4.5** Select the pertinent laboratory tests and diagnostic procedures for evaluating the function of the biliary tree.
- 4.6** Recognize the normal sonographic appearance of the gallbladder and biliary system
- 4.7** Explain scanning techniques associated with obtaining sonograms of the gallbladder and biliary system

Common Course Number: SON 1111

UNITS

Unit 5 Pancreas

General Outcome:

5.0 The student shall: demonstrate an understanding of advanced gross and sonographic anatomy and physiology of the pancreas.

Specific Measurable Learning Outcomes:

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

- 5.1** Describe the various positions and size of the normal pancreas.
- 5.2** Define the internal and surface anatomy of the pancreas.
- 5.3** Illustrate the cross-sectional anatomy of the pancreas and adjacent structures.
- 5.4** Describe congenital anomalies affecting the pancreas.
- 5.5** Identify the enzymes/secretions by explaining the functions of the pancreas
- 5.6** Describe the normal echo pattern associated with the pancreas as compared to surrounding organs.
- 5.7** Select the pertinent laboratory tests and other diagnostic procedures to evaluate the function of the pancreas.
- 5.8** Recognize the normal sonographic appearance of the pancreas.
- 5.9** Explain scanning and Doppler techniques of the pancreas and it's vasculature

Common Course Number: SON 1111

UNITS

Unit 6 Renal

General Outcome:

6.0 The student shall: demonstrate an understanding of advanced gross and sonographic anatomy and physiology of the kidneys.

Specific Measurable Learning Outcomes:

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

- 6.1** Identify anatomy of renals
- 6.2** Describe physiology of renals
- 6.3** Describe the location and size of the kidneys.
- 6.4** Recognize and describe the internal and surface anatomy and the normal sonographic appearance of the following renal structures:
 - A. cortex
 - B. hilus (renal arteries and veins)
 - C. medulla
 - D. pyramids
 - E. major calyces
 - F. arcuate arteries
 - G. other intrarenal arteries and veins
 - H. renal pelvis
- 6.5** Illustrate the cross-sectional anatomy of the renal system and adjacent structures
- 6.6** Explain the congenital anomalies that may affect the kidneys and ureters.
- 6.7** Recall the functions of the kidneys
- 6.8** Select the pertinent laboratory tests and radiologic procedures for evaluating the function of the renal system.
- 6.9** Explain scanning and Doppler techniques of renals and renal vasculature

Common Course Number: SON 1111

UNITS

Unit 7 Adrenal (Suprarenal) Glands

General Outcome:

7.0 The student shall: demonstrate an understanding of advanced gross and sonographic anatomy and physiology of the adrenals

Specific Measurable Learning Outcomes:

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

- 7.1** Recognize and describe the internal and surface anatomy, size, position and the normal sonographic pattern of the adrenal glands and adjacent anatomy.
- 7.2** Illustrate the cross-sectional anatomy of the adrenal glands and adjacent structures.
- 7.3** Identify the congenital anomalies affecting the adrenal glands.
- 7.4** Explain the functions of the adrenal gland.
- 7.5** Select the pertinent laboratory tests and other diagnostic procedures for evaluating the function of the adrenal glands.
- 7.6** Discuss anatomy, physiology, and scanning techniques of adrenals

Common Course Number: SON 1111

UNITS

Unit 8 Spleen

General Outcome:

8.0 The student shall: demonstrate an understanding of advanced gross and sonographic anatomy and physiology of the spleen.

Specific Measurable Learning Outcomes:

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

- 8.1** Describe the location, size and position of the spleen.
- 8.2** Explain the internal and surface anatomy of the spleen.
- 8.3** Illustrate cross-sectional anatomy of the spleen and adjacent structures.
- 8.4** Describe the appearance and the significance of splenic congenital anomalies.
- 8.5** Recall the functions of the spleen.
- 8.6** Select the pertinent laboratory tests and radiologic procedures for evaluating the spleen.
- 8.7** Recognize the normal sonographic appearance and pattern of the spleen.
- 8.8** Explain scanning and Doppler techniques for the spleen and associated vasculature

Common Course Number: SON 1111

UNITS

Unit 9 Retroperitoneum**General Outcome:**

- 9.0 The student shall:** demonstrate an understanding of advanced gross and sonographic anatomy and physiology of the lymph nodes and retroperitoneal structures.

Specific Measurable Learning Outcomes:

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

- 9.1** Illustrate the lymphatic drainage system.
- 9.2** Explain the functions of the lymphatic system.
- 9.3** Distinguish between normal and abnormal sonographic appearances of the retroperitoneum.
- 9.4** Explain examination techniques associated with the retroperitoneum