



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: Abdominal Sonography II

COMMON COURSE NUMBER: SON1112

CREDIT HOURS: 3

CONTACT HOUR BREAKDOWN

(per 16 week term)

CLOCK HOURS:

(Voc. Course ONLY)

Lecture: 48

Lab:

Clinic:

Other:

PREREQUISITE(S): SON1100, SON1170, SON 1111, SON1121, SON1211, SON1804, SON1214

COREQUISITE(S): SON1122, SON1212, SON1215, SON1814

PRE/COREQUISITE(S):

COURSE DESCRIPTION (750 character smaximum): **An in-depth presentation of sonograms of the abdominal area stressing deviations from the norm and the studies to make a diagnostically acceptable study.**

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. Liver
4. Gallbladder and Biliary
5. Pancreas
6. Renal
7. Adrenal Glands
8. Spleen
9. Retroperitoneum and peritoneum
10. Gastrointestinal System

ASSESSMENT:

Please provide a brief description (250 characters maximum) that details how students will be assessed on the course outcomes.
Quizzes, Midterm Exam and Final Exam – All 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: SON1112

UNITS

Unit 1 General

General Outcome:

- 1.0 The student shall: demonstrate an understanding of correlation of clinical, laboratory and sonographic and Doppler data in the identification and demonstration of pathophysiologic processes in the abdomen**

Specific Measurable Learning Outcomes:

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

- 1.1 Explain the common pathology related to the upper abdomen and correlate with special scanning techniques
- 1.2 Explain the normal preparations for the sonographic demonstration of the upper abdominal organs
- 1.3 Explain the protocol for scanning the upper abdominal organs
- 1.4 Discuss basic concepts of the causes of disease
- 1.5 Discuss gastrointestinal diseases
- 1.6 Demonstrate knowledge of human systemic and sectional anatomy and physiology, vasculature, and blood flow
- 1.7 Explain the effects of physiological and pathological conditions on anatomy and blood flow
- 1.8 Identify sonographic representation of normal and abnormal anatomy
- 1.9 Obtain pertinent measurements related to sonographic evaluation of normal and abnormal structures.
- 1.10 Demonstrate knowledge related to sonographic and Doppler evaluation of abdominal vasculature and blood flow in normal and pathologic states
- 1.11 Integrate patient history and physical findings to determine appropriate area(s) of interest for obtaining diagnostic examinations
- 1.12 Demonstrate knowledge and understanding of related imaging, laboratory and testing procedures as they contribute to the clinical evaluation of disease and pathology
- 1.13 Demonstrate ability to integrate knowledge about multi-system pathologies, such as the

sonographic manifestations in the abdomen that may be found with AIDS patients

- 1.14** Demonstrate knowledge of application of optimal scanning techniques and imaging for specific areas of interest, i.e., scanning motions, planes and orientation
- 1.15** Demonstrate knowledge of when and how to modify the scanning protocol based on the sonographic findings and the differential diagnosis
- 1.16** Recognize, identify, and demonstrate knowledge of appropriate documentation of abnormal sonographic and Doppler patterns of disease processes, pathology, and pathophysiology of all the abdominal organs, vasculature and supporting structures
- 1.17** Identify and describe the sonographic and Doppler patterns in clinical diseases which may occur in the following categories:
 - a. iatrogenic
 - b. degenerative
 - c. inflammatory
 - d. traumatic
 - e. neoplastic
 - f. infectious
 - g. obstructive
 - h. congenital
 - i. metabolic
 - j. immunologic
- 1.18** Recall the anatomy, physiology, laboratory data and sonographic and Doppler information from Term I and be able to integrate such information into knowledge of pathological conditions associated with the abdomen

Common Course Number: SON1112

UNITS

Unit 2 Vascular System

General Outcome:

- 2.0 The student shall:** demonstrate an understanding of the blood flow and pathophysiological processes of the abdominal vascular system.

Specific Measurable Learning Outcomes:

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

- 2.1** Name and describe at least four types of aneurysms
- 2.2** Describe three pathological conditions associated with veins
- 2.3** Create high quality diagnostic scans demonstrating the appropriate anatomy in all planes pertinent to the vascular system
- 2.4** Select the correct equipment settings appropriate to individual body habitus
- 2.5** Distinguish between the normal and abnormal sonographic appearance of the vascular anatomy and between normal and abnormal blood-flow patterns as demonstrated with Doppler and imaging techniques

Common Course Number: SON1112

UNITS

Unit 3 Liver

General Outcome:

- 3.0 The student shall:** demonstrate an understanding of the pathophysiological processes of the liver.

Specific Measurable Learning Outcomes:

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

- 3.1** Differentiate between normal and abnormal sonographic appearances and explain the clinical significance and manifestations of the following masses affecting the liver:
- a. cystic
 - 1) single
 - 2) multiple
 - 3) echinococcus
 - b. hepatoma
 - c. metastatic
 - d. abscess
 - 1) pyogenic
 - 2) amebic
 - e. hemangioma
 - f. lymphoma
 - g. other benign masses
 - h. other malignant masses
- 3.2** Describe the sonographic appearance of intrahepatic and extrahepatic biliary obstruction and explain the clinical causes of these conditions
- 3.3** Describe the sonographic appearance of the liver secondary to congestive heart failure and explain the clinical effects
- 3.4** Describe the sonographic appearance and explain the clinical significance of the following hepatocellular diseases:
- a. hepatitis
 - b. cirrhosis
 - c. fatty disease
- 3.5** Describe vascular flow patterns associated with hepatocellular disease
- 3.6** Demonstrate understanding of the role of Doppler techniques in evaluation of portal hypertension
- 3.7** Describe techniques used to relieve pressure associated with portal hypertension

- 3.8** Describe the role of sonography in the evaluation of shunt patency
- 3.9** Create high quality diagnostic scans, demonstrating the appropriate anatomy in all planes pertinent to the liver
- 3.10** Select the correct equipment settings appropriate to individual body habitus
- 3.11** Distinguish between the normal and abnormal appearance of the liver

Common Course Number: SON1112

UNITS

Unit 4 Gallbladder and Biliary System

General Outcome:

- 4.0 The student shall:** demonstrate an understanding of the pathophysiological processes of the gallbladder

Specific Measurable Learning Outcomes:

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

- 4.1** Differentiate between the normal and abnormal sonographic appearance of the gallbladder by explaining the pathological process in the following diseases:
- a. jaundice
 - b. cholelithiasis
 - c. cholecystitis
 - 1) acute
 - 2) chronic
 - d. cholesterosis
 - e. diverticulosis
 - f. benign tumors
 - g. carcinoma
- 4.2** Differentiate between the normal and abnormal sonographic appearance of the biliary system by explaining the clinical significance of the following abnormalities of the hepatobiliary tree:
- a. choledocholithiasis
 - b. cholangitis
 - c. helminthiasis
 - d. benign tumors
 - e. carcinoma
 - f. biliary cirrhosis
- 4.3** Create high quality diagnostic scans demonstrating the appropriate anatomy in all planes/orientations pertinent to the biliary system
- 4.4** Select the correct equipment settings appropriate to individual body habitus
- 4.5** Distinguish between normal and abnormal appearances of the biliary system
- 4.6** Demonstrate knowledge of sonographic and Doppler evaluation of portal and hepatic vasculature and blood flow in the normal and pathological state
- 4.7** Identify sonographic representation of pertinent measurements associated with the biliary system and recall normal and abnormal values

Common Course Number: SON1112

UNITS

Unit 5 Pancreas

General Outcome:

- 5.0 The student shall:** demonstrate an understanding of the pathophysiological processes of the pancreas.

Specific Measurable Learning Outcomes:

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

- 5.1** Differentiate between normal and abnormal sonographic appearances of the pancreas by explaining the clinical significance of the pathological processes in the following diseases:
- a. acute pancreatitis
 - b. acute hemorrhagic pancreatitis
 - c. chronic pancreatitis
 - d. pancreatic cysts
 - e. pancreatic pseudocysts
 - f. benign tumors
 - g. malignant neoplasms of the pancreas
- 5.2** Create high quality diagnostic scans demonstrating the appropriate anatomy in all planes/orientations pertinent to the pancreas
- 5.3** Select the correct equipment settings appropriate to individual body habitus
- 5.4** Distinguish between the normal and abnormal sonographic appearance of the pancreas
- 5.5** Assess the pancreatic duct size and condition
- 5.6** Determine the effects of pancreatic neoplasm on the common bile duct size and function

Common Course Number: SON1112

UNITS

Unit 6 Renal

General Outcome:

- 6.0 The student shall:** demonstrate an understanding of the pathophysiological processes of the kidneys.

Specific Measurable Learning Outcomes:

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

- 6.1** Differentiate between the normal and abnormal sonographic appearance of the kidneys by explaining the clinical significance of the pathological processes in the following conditions:
- a. hydronephrosis
 - b. dysplastic or hypoplastic kidney
 - c. renal carbuncle or perirenal abscess
 - d. renal sinus lipomatosis
 - e. benign renal tumors
 - f. malignant tumors
 - g. metastatic disease to the kidneys
 - h. renal cystic disease
 - i. chronic renal failure
 - j. renal transplant and rejection
 - k. renal calculi
 - l. unilateral renal agenesis
 - m. ectopic kidney
 - n. other renal **variants**, i.e., horseshoe, etc.
- 6.2** Create high quality diagnostic scans demonstrating the appropriate anatomy in all planes/orientations pertinent to the kidneys
- 6.3** Name the correct equipment settings appropriate to individual body habitus
- 6.4** Distinguish between the normal and abnormal appearance of the kidneys.
- 6.5** Discuss urogenital pathology and correlate sonograms with other diagnostic imaging studies
- 6.6** Discuss pathology of renals and implications of abnormal laboratory findings
- 6.7** Compare the normal and pathological anatomy of the human renal system to include the adrenals
- 6.8** Describe the scanning techniques common to sonographic imaging of the renals and adrenals

- 6.9** Identify sonographic and Doppler representation of normal and abnormal vasculature and blood flow associated with the kidneys – native and transplanted

- 6.10** Identify sonographic representation of normal and abnormal measurements pertinent to normal and pathological kidney structures

Common Course Number: SON1112

UNITS

Unit 7 Adrenal Glands

General Outcome:

7.0 The student shall: demonstrate an understanding of the pathophysiological processes of the adrenal (suprarenal) glands

Specific Measurable Learning Outcomes:

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

- 7.1** Differentiate between the normal and abnormal sonographic appearance related to the adrenal glands and explain the clinical significance of the pathological processes in the following conditions:
- a. primary adrenal tumors
 - b. secondary adrenal tumors
 - c. adrenal cysts
 - d. Addison's disease
 - e. Cushing's syndrome
 - f. adrenal hemorrhage in the neonate
- 7.2** Create high quality diagnostic scans demonstrating the appropriate anatomy in all planes/orientations pertinent to the adrenal glands
- 7.3** Select the correct equipment settings appropriate to individual body habitus.
- 7.4** Distinguish between normal and abnormal sonographic appearances of the adrenal gland
- 7.5** Discuss pathology of the adrenals and the significance of clinical laboratory data in the diagnosis of adrenal pathology

Common Course Number: SON1112

UNITS

Unit 8 Spleen

General Outcome:

8.0 The student shall: demonstrate an understanding of the pathophysiological processes of the spleen.

Specific Measurable Learning Outcomes:

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

- 8.1** Identify regressive and circulatory changes affecting the spleen
- 8.2** Summarize the effect of systemic infections and anemia to the spleen
- 8.3** Identify those conditions that cause splenomegaly and explain their clinical significance
- 8.4** Differentiate between the normal and abnormal sonographic appearance of the spleen
- 8.5** Explain the clinical significance of primary tumors and cysts which involve the spleen and describe their sonographic appearances
- 8.6** Identify metastatic diseases which may involve the spleen
- 8.7** State four diseases of the spleen seen in children and young adults
- 8.8** Create high quality diagnostic scans demonstrating the appropriate anatomy in all planes/orientations pertinent to the spleen
- 8.9** Select the correct equipment settings appropriate to individual body habitus

Common Course Number: SON1112

UNITS

Unit 9 Retroperitoneum and Peritoneum

General Outcome:

- 9.0 The student shall:** demonstrate an understanding of the pathophysiological processes of the lymph nodes, retroperitoneum and peritoneal spaces.

Specific Measurable Learning Outcomes:

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

- 9.1** Identify the following pathological conditions as associated with the retroperitoneum
- a. mesenteric cysts
 - b. peritoneal implants (seeding)
 - c. ascites
 - d. Gardner's syndrome (dermoid tumor)
 - e. retroperitoneal lymphadenopathy
 - f. retroperitoneal fibrosis
- 9.2** Create high quality diagnostic scans demonstrating the appropriate anatomy in all planes/orientations pertinent to the retroperitoneum
- 9.3** Select the correct equipment settings appropriate to individual body habitus
- 9.4** Distinguish between normal and abnormal sonographic and Doppler patterns associated with structures in the retroperitoneum

Common Course Number: SON1112

UNITS

Unit 10 Gastrointestinal System

General Outcome:

10.0 The student shall: demonstrate an understanding of the pathophysiological processes of the gastrointestinal system.

Specific Measurable Learning Outcomes:

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

- 10.1** Describe the capabilities and limitations of sonographic evaluation of the G.I. system
- 10.2** Describe the preparation for, and overall procedures for, ultrasound examination of the G.I. system
- 10.3** Identify the G.I. tract anatomy as demonstrated by sonographic imaging and anatomic drawings
- 10.4** Discuss gastrointestinal diseases
- 10.5** Recognize, identify, and appropriately document the ultrasound representation of normal anatomy and pathological states of the gastrointestinal tract, including, but not limited to:
 - a. inflammation and inflammatory conditions
 - b. wall thickening
 - c. intestinal obstruction
 - d. neoplasm
 - e. variations in normal bowel patterns