Bossier Parish Community College
Master Syllabus

Course Prefix and Number: SONO 210 **Credit hours**: 1

Course Title: Physics and Instrumentation II

Course Prerequisites: Enrollment in the DMS program courses is limited to those students who have been selected and admitted to the professional phase of the program. Program courses are sequenced by semester and must be taken as a group each semester per program requirements and policies. Completion of SONO 201

Textbook(s):
Required Textbooks: Understanding Ultrasound Physics: Sidney Edelman 4th edition

Course Description:

Lectures and related demonstrations covering advanced areas of ultrasonic propagation principles, transducer parameters, acoustic artifacts, possible biologic effects, advanced equipment types, contrast-enhanced imaging, and quality control procedures. An introduction to Doppler physics is included.

Learning Outcomes:

A. Demonstrate knowledge and application of image production and optimization.
1) Contrast-enhanced imaging
2) Harmonics
2) Emerging technologies
3) Image storage devices
4) Introduction to Doppler
5) Acoustic Artifacts

B. Demonstrate knowledge of a quality control and improvement program.
1) Lab accreditation
2) Credentialing organizations
3) Equipment operation and maintenance
    a) Phantom testing
    b) Records maintenance

To achieve the learning outcomes, the student will or will be able to:
- List and compare the various kinds of flow encountered in blood circulation.
- Explain how a stenosis affects flow.
- Explain how the Doppler effect is applied in sonography.
- List the ways in which Doppler information is presented.
- Define and discuss the Doppler effect, the Doppler shift, and the Doppler angle.

- Explain how two-dimensional flow information is color-encoded on a sonographic display.
- Compare Doppler-shift with Doppler-power color displays.
- Explain how flow detection is localized to a specific site in tissue by using pulsed Doppler techniques.
- Describe spectral analysis.
- Discuss examples of how spectral analysis is applied to evaluate flow conditions at the site of measurement and proximal and distal to it.
- List reasons for incorrect presentation of anatomic structures on sonographic gray-scale images.
- List reasons for incorrect presentation of motion and flow information on spectral and color-Doppler displays.
- Describe how specific artifacts can be recognized.
- Explain how to avoid the pitfalls and misdiagnoses artifacts can cause.
- Explain how to determine whether a sonographic or Doppler instrument is working properly.
- List the devices that are available to test various performance characteristics of instruments.
- Compare a test object with a phantom.
- Describe how instrument output is measured.

Course Requirements: **In order to pass the course, the student must earn 76% of the total possible points on the unit tests for the course and make a minimum score of 70% on the final exam. The student must achieve an overall course average of 76%. Grades will not be rounded. Failure to complete any of the course requirements listed below will result in an "F" for the course.**

The student will:

- Participate in/complete all classroom/laboratory experiences (such as discussion questions; quizzes; section test; case studies; concept mapping; DVD, video, web-site, or reading assignments).
- Be held responsible for the content of the entire course. The final exam is mandatory, will be cumulative, and worth 25% of the overall grade for the course.

Course Grading Scale:

93 –	100%=	A
85 –	92%=	B
76 –	84%=	C
68 –	75%=	D
0 –	67%=	F

Attendance Policy: The college attendance policy (for the classroom) is available at http://catalog.bpcc.edu/content.php?catoid=5&navoid=369#class-attendance

Course Fees: (if applicable)

Nondiscrimination Statement

Bossier Parish Community College does not discriminate on the basis of race, color, national origin, gender, age, religion, qualified disability, marital status, veteran's status, or sexual orientation in admission to its programs, services, or activities, in access to them, in treatment of individuals, or in any aspect of its operations. Bossier Parish Community College does not discriminate in its hiring or employment practices.

COORDINATOR FOR SECTION 504 AND ADA
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