

North Hennepin Community College

PHYS 1220: Allied Health Physics

A. COURSE DESCRIPTION

Credits: 2

Lecture Hours/Week: *.*

Lab Hours/Week: *.*

OJT Hours/Week: *.*

Prerequisites: None

Corequisites: None

MnTC Goals: None

This course provides the allied health or paramedical student with a concentrated treatment the basic physics principles of ultrasound which would be needed for follow on courses in the Allied Health field. Completion of one college level science course and college algebra is strongly recommended.

B. COURSE EFFECTIVE DATES: 05/28/2002 - Present

C. OUTLINE OF MAJOR CONTENT AREAS

1. The student will become familiar with the basic physics of ultrasound, with medical applications to be stressed. The course covers the aspects of continuous and pulsed ultrasound; transducer operation; the physics of beam forming and scanning; imaging Instruments including memory and display technologies. Doppler signal processing will be extensively covered, including spectral and color Doppler displays with concentration on analysis, artifacts, performance and safety issues.

D. LEARNING OUTCOMES (General)

1. Understand the basic concepts of wave physics, including period, frequency, and wavelength
2. Understand the concept of pulsed ultrasound waves
3. Be familiar with the formation of echoes (returned pulses) and the limitations placed on these echoes by attenuation.
4. Understand the mechanics and electronics of the transducer.
5. Be knowledgeable of how beams are formed, how focusing is achieved, how automatic scanning is accomplished, and the trade offs involved in Detailed Resolution.
6. Understand the mechanics and electronics of the imaging Instrument.
7. Be knowledgeable of signal procession, image processing, and display processing is accomplished.
8. Be familiar with the basic forms of fluid flow, the Doppler shift and its application to the detection of turbulent flow in the vicinity of stenoses. A complete understanding of the importance of Doppler Angle as it relates to the detection of fluid flow.
9. Understand Doppler Color Displays; ability to understand color theory as it relates to the ability of enhancing Doppler-Shift and Doppler-Power display information.

E. Minnesota Transfer Curriculum Goal Area(s) and Competencies

None

F. LEARNER OUTCOMES ASSESSMENT

As noted on course syllabus

G. SPECIAL INFORMATION

None noted