



Biomedical Ultrasound

BIOMEDE 5186

Credit Hours:

3.00 - 3.00

Course Levels:

Undergraduate (1000-5000 level)

Graduate (5000-8000 level)

Course Components:

Lecture

Course Description:

Introduction to use of ultrasound in biomedical applications, including interaction of ultrasound with tissue; generation, reception and interpretation of ultrasonic signals; and clinical instrumentation.

Prerequisites and Co-requisites:

Prereq: 4110 or equiv, and Sr standing; or Grad standing; or permission of instructor.

Course Goals / Objectives:

- Derive the governing equations for elastic, compressional wave propagation in continuous and lossless medium
 - Apply acoustic reflection, transmission and scattering laws to solve wave propagation problems in biological tissue
 - Apply transducer design principles to derive essential instrumentation characteristics of ultrasound imaging systems
 - Describe the strength and weaknesses of ultrasound imaging as a diagnostic tool in comparison to other imaging modalities
 - Describe the current technological challenges and advancement in biomedical ultrasound
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Course Topics:

- Wave equation and solutions
 - Impedance, power and reflection
 - Ultrasound and tissue interaction
 - Transducers, beam pattern and resolution
 - Diagnostic imaging configurations and clinical systems
 - Advanced topics
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Designation:

Elective