Physics 323 : Physical Acoustics-Theory and Applications

Course Outline

General Information

Lecturer:	Professor Junru Wu
Office:	Cook Physical Science Building A526
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Office Hours	M 10-11, W 1-3 and by appointment

Lecture	TR	10:00-11:15	Cook 402

Course Prerequisites: Math 123, 230 or equivalent, Physics 211

Course Description: This is a seminar-type course. It will cover: Fundamentals of Vibration; Transverse Motion: The Vibrating String. Vibrations of Bars; The Two-Dimensional Wave Equation: Vibrations of Membranes and Plates; The Acoustic Wave Equation; Reflection and Transmission; Radiation of Acoustic Waves; Absorption and Attenuation of Sound; Cavities and Waveguides; Pipes, Resonators, and Filters; Selected Nonlinear Acoustic Effects; Shock Waves; Acoustic Cavitation; Acoustic Radiation Force; Acoustic Streaming. It will also discuss applications Including: Vibrational Energy harvests; Sonoluminescence; Noninvasive targeted drug delivery and Cancer treatment.

Course Text: Fundamentals of acoustics, Fourth Edition, by L. E. Kinsler, A. R. Frey, A. B. Coppens, J. V. Sanders, John Wiley & Sons, New York, 1999. ISBN: 978-0-471-84789-2

This text is available at the UVM Bookstore and online.

Chapters: 1, 2, 3, 4, 5, 6, 8, 9, 10, 16.

References: Fundamentals of physical acoustics, by David T. Blackstock, John Wiley & Sons, 2000.

Homework: There will be problems assignment and research papers to read.

Exams: There will be two exams/research projects.