

--- Course Description ---

MECH 584 Advanced Engineering Acoustics

Designation

MECH 584, section 101 - catalogue number 45429 - 3 credits

Coordinator

Dr. Murray Hodgson, Professor, 822-3073

Prerequisites

Students should normally have taken an engineering or physics course in acoustics at the undergraduate level and be registered as graduate students.

Objective

To provide students with a thorough conceptual understanding of, and some practical experience with, fundamental and topical acoustical phenomena and their applications in research. To provide students with experience in researching, preparing and giving university lectures.

Format

The course will consist of about 12, 2-3 hour lectures on fundamental topics in acoustics (see below). Some of the lectures will be given by invited and departmental specialists in the field of acoustics. The remaining lectures will be prepared and given by the students under the supervision of the course coordinator. Lecture topics will be chosen, and assigned to students, on the basis of their interests and backgrounds.

Students will also undertake a small project related to their lecture topic. The objective is to reinforce the lecture material and give students experience of acoustical theory, analysis and experimentation. A report on the project work will be prepared for evaluation.

Evaluation (subject to change)

Lecture presentation =	40 %
Project report =	40 %
Final exam =	<u>20 %</u>
Total =	<u>100 %</u>

The final exam will consist of 1 question (requiring about 10 minutes to answer) on core lecture topics. Each will be chosen from three given to students beforehand.

Lecture topics and lecturers:

1. Sound sources, waves, propagation (MH)
2. Reflection / transmission at fluid interfaces (MH)
3. Sound transmission through partitions (MH)
4. Sound propagation in ducts, pipes (MH)
5. Sound in rooms – wave approach (MH)
6. Sound in rooms – geometric approach (MH)
7. Outdoor sound propagation
8. Underwater sound propagation (Prof. S. Dosso, SEOS, U.Vic.)
9. Ultrasound (Prof. R. Rohling, ECE/MECH, UBC)
10. Sound-absorbing materials
11. Active noise control