THE SCIENCE OF SOUND & MUSIC

Please mute your microphone to avoid feedback loop!

Course Introduction

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About the course

THE SCIENCE OF SOUND & MUSIC

Quartile 2
1 ACOUSTIC AWARENESS

- Pitch presentations
- Exploring acoustic topic
- Preparation of question for SOS Science Quiz

Quartile 3
2 THE SCIENCE OF SOUND

- Lectures and hands-on exercises
- Wide range of topics
- Relation with state-of-art research

Quartile 4
3 SOUNDS GOOD!

- Project work
- Acoustic project related to industry
- Sound Symposium

Weekly layout

Some deviations in weeks 2 and 7!
Communicated via announcements on Canvas or email

Timeslot	Monday	Thursday	Location
1	Test (weeks 3, 5, 7, 8)		Canvas Conference or Teams
2	Test discussion (weeks 3, 5, 7, 8)		Canvas Conference or Teams
3	Lecture		Canvas Conference or Teams
4	Lecture		Canvas Conference or Teams
5		Self study	Canvas Conference or Teams
6		Self study	Canvas Conference or Teams
7		Excercises	Canvas Conference or Teams
8		Excercises	Canvas Conference or Teams

Course material

The Science of Sound (3rd edition). Thomas D. Rossing, F. Richard Moore, Paul A. Wheeler. Addison-Wesley, 2002.

Additional reader as per Module.

Examination

4 x weekly test, 3 best tests count weighting 40 %

Final written exam with questions from all weeks weighting 60 %
Minimum result of final exam = 5 (on a 10 scale)
No course material allowed during exam

Course Content

Week		Contents
1		*Module 1: Physics of sound* Introduction to the main concepts in acoustics: definition of acoustic waves, frequency, wavelengths, speed of sound, impedance, resonance frequency, etc.
2		*Module 1: Vibroacoustics and musical instruments* This week is fully based on the concept source-transmitter-receiver applied to vibro-acoustics and duct acoustics. We will pay attention to sources of vibration of sources of sound, structural and acoustic transmission paths, sound radiation and radiation efficiency and the idea of transfer function.

Course Content

Week	Contents
3	 *Module 2: Sound perception* Introduction of basic aspects of human auditory perception: frequency range, amplitude range. Perceptual descriptors like loudness, pitch, timbre. Spatial perception (direction, distance, compactness of sources, listener envelopment). Resolution, just noticeable differences, masking. Some basic anatomy and physiology and behavioural testing.
4	 *Module 2: Acoustic communication* Speech production and relation to speech perception: anatomy, acoustics, source-filter model of speech production, formants, prosodic features. Influence of room transfer on speech intelligibility. Animal acoustic communication: Types of sound generation, interrelation with sound signal propagation and reception

Course Content

Week	Contents
5+6	 * *Module 3: Room and electro-acoustics* This part of the course covers the principles of free field and diffuse field sound transmission in rooms (calculation- and measurement methods, room acoustic parameters, speech intelligibility, Just Noticeable Differences) with and without the use of electronic reinforcement systems.
7	 *Module 4: Environmental acoustics* Physical aspects of sound propagation in outdoor environments: influence of ground, meteorology, screening and urban environments. Noise control for environmental acoustics by mitigation measures in the transfer path.

*subject to change

THE SCIENCE OF SOUND

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