EE-490(a) **Lab in acoustics**

Lissek Hervé

Cursus	Sem.	Type
Electrical and Electronical Engineering	MA1, MA3	Opt.

Language of teaching	English
Credits	4
Withdrawal	Unauthorized
Session	Winter
Semester	Fall
Exam	During the semester
Workload	120h
Weeks	14
Hours	**4 weekly**
TP	4 weekly
Number of positions	

It is not allowed to withdraw from this subject after the registration deadline.

Summary

Apply the knowledge acquired in Electroacoustics, Audio Engineering and Propagation of Acoustic Waves lectures.

Content

1. TP1: Matlab - programming of tools for acoustics and audio
2. TP2: Analysis and synthesis of a piano note
3. TP3: Audiometry
4. TP4: Auditory localization
5. TP5: Reverberant room
6. TP6: Absorption in impedance tube
7. TP7: Acoustic expertise
8. TP8: Simulation of spherical sound sources with COMSOL
9. TP9: Simulation 1D acoustic waveguide with COMSOL
10. TP10: Simulation of the impedance tube (TP6) with COMSOL
11. TP11: Assessment of Thiele & Small parameters for a loudspeaker
12. TP12: Coherent sources / interferences
13. TP13: Measurement of sources directivity

Keywords

Sound synthesis
3D sound perception
Room acoustics
Acoustic absorption
Loudspeakers
Acoustc expertise

Learning Prerequisites

Required courses

Audio Engineering or Propagation of acoustic waves

Recommended courses

Electroacoustics

Important concepts to start the course

Acoustic waves
Transmission lines
Physical measurement
Characterization of physical systems, impulse response
Signal processing, Fourier analysis

Learning Outcomes

By the end of the course, the student must be able to:

- Argue hypothesis justifying a physical observation
- Formulate physical explanations
- Synthesize experimental results
- Organize the work within a team of students

Transversal skills

- Use a work methodology appropriate to the task.
- Give feedback (critique) in an appropriate fashion.
- Identify the different roles that are involved in well-functioning teams and assume different roles, including leadership roles.

Teaching methods

1 laboratory fiche given every week.
4 hours to perform the work described in the fiche
1 assistant providing help if required
Report the work within a 15 days deadline

Expected student activities

Report the work

Assessment methods

Report correction

Supervision

Office hours	Yes
Assistants	Yes
Forum	No

Resources

Bibliography

Mario Rossi, Audio, PPUR, 2007
Vincent Martin, Elements d'acoustique générale, PPUR 2007

Ressources en bibliothèque

- Eléments d'acoustique générale / Martin
- Audio / Mario

Moodle Link

- https://go.epfl.ch/EE-490_a