Last update: 19-04-2018

220223 - Acoustics

Coordinating unit: 205 - ESEIAAT - Terrassa School of Industrial, Aerospace and Audiovisual Engineering

Teaching unit: 712 - EM - Department of Mechanical Engineering

Academic year: 2018

Degree: MASTER'S DEGREE IN SPACE AND AERONAUTICAL ENGINEERING (Syllabus 2016). (Teaching unit Optional)
MASTER'S DEGREE IN INDUSTRIAL ENGINEERING (Syllabus 2013). (Teaching unit Optional)
MASTER'S DEGREE IN AERONAUTICAL ENGINEERING (Syllabus 2014). (Teaching unit Optional)

ECTS credits: 3 Teaching languages: English

Teaching staff

Coordinator: Andreu Balastegui

Others: Teresa Pàmies, Jordi Romeu,

Teaching methodology

The course is divided into parts:
Theory classes.
Lab sessions.
Self-study for doing exercises and activities.
In the theory classes, teachers introduce the theoretical basics, concepts, methods and results and illustrate them with examples appropriate to facilitate their understanding. Teachers guide students in applying theoretical concepts to solve problems, always using critical reasoning. We propose that students solve exercises in and outside the classroom, to promote contact and use the basic tools needed to solve problems.
In the lab sessions, the teachers introduce the basic concepts of acoustic measurement and numerical simulations and assist the students.
Students, independently, need to work on the materials provided by teachers and the outcomes of the sessions of exercises, in order to assimilate the concepts.
The teachers provide the syllabus and monitoring of activities (by ATENEA).

Learning objectives of the subject

Basic concepts of acoustics across the whole knowledge chain of theory, simulation and measurements.

Study load

Total learning time: 75h	Hours large group:	27h	36.00%
	Self study:	48h	64.00%

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Content

Module 1: Fundamentals of Acoustics

Learning time: 12h

Theory classes: 6h
Self study : 6h

Description:
An introduction to the basic concepts of acoustics from the fundamental definitions and parameters to the outdoor propagation of sound.

Related activities:
Class exercises.

Module 2: Room Acoustics

Learning time: 14h

Theory classes: 8h
Self study : 6h

Description:
An introduction to the basic concepts of the modal behaviour of sound in enclosures and noise insulation.

Related activities:
Class exercises.

Module 3: Computational Acoustics

Learning time: 25h

Theory classes: 18h
Self study : 7h

Description:
VirtualLab is a Finite Element software used to study noise and vibration for small and medium scale mechanical systems.
A brief introduction to VirtualLab will precede a series of practical sessions designed to acquire the basic knowledge needed to solve a proposed problem.

Related activities:
Lab session report.

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Module 4: Measurement Techniques	Learning time: 10h Theory classes: 2h Self study : 8h

Description:
An introduction to measurement instruments and international norms for noise assessment.

Related activities:
Lab session report.

Module 5: Project	Learning time: 14h Theory classes: 4h Self study : 10h

Description:
The students will have to perform a simulation of a proposed acoustical problem. The project will conclude with a written report.

Related activities:
Project report.

Qualification system

Class exercises: 30%
Lab session reports: 30%
Project report: 40%

Bibliography