

Course guide

320110 - A - Acoustics I

Last modified: 11/04/2025

Unit in charge: Terrassa School of Industrial, Aerospace and Audiovisual Engineering
Teaching unit: 739 - TSC - Department of Signal Theory and Communications.

Degree: BACHELOR'S DEGREE IN AUDIOVISUAL SYSTEMS ENGINEERING (Syllabus 2009). (Compulsory subject).

Academic year: 2025 **ECTS Credits:** 6.0 **Languages:** Catalan, Spanish

LECTURER

Coordinating lecturer: Nogueiras Rodriguez, Albino

Others: Esquerra Lluçia, Ignasi

PRIOR SKILLS

It is strongly recommended for students to have passed the Physics subject.

DEGREE COMPETENCES TO WHICH THE SUBJECT CONTRIBUTES

Specific:

CE24-ESAUD. Ability to carry out acoustic engineering projects on: acoustic insulation and conditioning of premises; public address systems; specification, analysis, and selection of electroacoustic transducers; noise and vibration measurement, analysis, and control systems; environmental acoustics; underwater acoustics systems. (Specific Technology Module: Sound and Image)

TEACHING METHODOLOGY

Face-to-face sessions:

- a) In the classroom: the lecturer explains subject content, give demonstrations, sets and resolves exercises and deals with doubts.
- b) In the laboratory: students perform practicals.

Online:

- c) Individual study and exercises.
- d) Completion of assignments and exercises to be handed in.

LEARNING OBJECTIVES OF THE SUBJECT

Acquiring the basic knowledge about the theory of the sound from the point of view of the generation and propagation of the sound waves in the free space. Understanding the basics of human sound perception. Knowing the behavior of the sound in closed precincts and the criteria for its conditioning and acoustic isolation. Knowing how to use the computer tools of acoustic design and the devices to carry out acoustic measures

STUDY LOAD

Type	Hours	Percentage
Hours large group	45,0	30.00
Self study	90,0	60.00
Hours small group	15,0	10.00

Total learning time: 150 h

CONTENTS

SOUND FUNDAMENTALS (1st PART)

Description:

content english

Full-or-part-time: 34h

Theory classes: 10h

Laboratory classes: 4h

Self study : 20h

SOUND FUNDAMENTALS (2nd PART)

Description:

content english

Full-or-part-time: 34h

Theory classes: 10h

Laboratory classes: 4h

Self study : 20h

ROOM ACOUSTICS (1st PART)

Description:

content english

Full-or-part-time: 34h

Theory classes: 10h

Laboratory classes: 4h

Self study : 20h

ROOM ACOUSTICS (2nd PART)

Description:

content english

Full-or-part-time: 33h

Theory classes: 10h

Laboratory classes: 3h

Self study : 20h

PHYSIOLOGICAL ACOUSTICS AND PSYCHOACOUSTICS

Description:

content english

Full-or-part-time: 15h

Theory classes: 5h

Self study : 10h



GRADING SYSTEM

Theory test 1st bimester 35 %
Theory test 2nd bimester 35 %
Laboratory: 20%
Homework: 10%

Just after the start of the second bimester, an improvement test is scheduled in order to reconduct unsatisfactory results in the theory test of the first bimester. This test will be done on the day for the final exam. All students are invited to participate in the improvement test, regardless of their original mark. The "improved" mark will be the mean between the marks of the first and the second tests. In the case that this mark is less than the original one, the prevailing mark will be the original one.

For those students who meet the requirements and submit to the reevaluation examination, the grade of the reevaluation exam will replace the grades of all the on-site written evaluation acts (tests, midterm and final exams) and the grades obtained during the course for lab practices, works, projects and presentations will be kept.

If the final grade after reevaluation is lower than 5.0, it will replace the initial one only if it is higher. If the final grade after reevaluation is greater or equal to 5.0, the final grade of the subject will be pass 5.0.

BIBLIOGRAPHY

Basic:

- Carrión, Antoni. Diseño acústico de espacios arquitectónicos [on line]. Barcelona: Edicions UPC, 2001 [Consultation: 14/05/2020]. Available on: <http://hdl.handle.net/2099.3/36341>. ISBN 9788483012529.
- Möser, Michael E. Engineering acoustics: an introduction to noise control [on line]. 2nd ed. Berlin, Heidelberg: Springer, 2009 [Consultation: 17/06/2022]. Available on: <https://link-springer-com.recursos.biblioteca.upc.edu/book/10.1007/978-3-540-92723-5>. ISBN 9786612332647.
- Professors de l'assignatura. Apunts de classe. Campus digital ATENEA,

Complementary:

- Ballou, Glen. Handbook for sound engineers [on line]. 5th edition. Burlington, MA: Focal Press, 2015 [Consultation: 14/07/2025]. Available on: <https://doi-org.recursos.biblioteca.upc.edu/10.4324/9780203758281>. ISBN 9781135016654.
- Kinsler, L.E. Fundamentos de acústica. México D.F: Limusa, 1998. ISBN 978-9-68-182026-8.
- Barron, M. Auditorium acoustics and architectural design. London: E & FN Spon, 1993. ISBN 0-419-17710-8.
- Long, M. Architectural acoustics. Burlington: Elsevier Academic Press, 2006. ISBN 0-12-455551-9.
- Recuero, M. Acústica arquitectónica aplicada. Madrid: Paraninfo, 1999. ISBN 978-8-42-832571-4.