Syllabus

Course Description

Course Title	Technical Acoustic
Course Code	43096
Course Title Additional	
Scientific-Disciplinary Sector	IIND-07/B
Language	Italian
Degree Course	Bachelor in Industrial and Mechanical Engineering
Other Degree Courses (Loaned)	
Lecturers	dr. Federica Morandi, Federica.Morandi@unibz.it https://www.unibz.it/en/faculties/engineering/academic-staff/person/41968
Teaching Assistant	
Semester	Summer school
Course Year/s	1, 2, 3
CP	3
Teaching Hours	18
Lab Hours	12
Individual Study Hours	42
Planned Office Hours	
Contents Summary	The course provides an overview of the three main areas of applied acoustics. Starting from notions related to wave propagation, the human auditory system, and sound perception, the course will address the topics of acoustics of confined spaces (absorption and diffusion, reverberation, intelligibility) sound insulation (airborne and structure-borne sound insulation, flanking transmission), and outdoor propagation (with a specific focus on vehicle acoustics).
Course Topics	- Sound propagation in air and solids - Human auditory system

	- Measurement and analysis of audio signals - Sound pressure levels - Outdoor sound propagation & acoustics of vehicles - Theory of reverberation, absorption, and diffusion - Airborne insulation, structureborne sound insulation and flanking transmission.
Keywords	applied acoustics; physical acoustics; signal processing; sound insulation; reverberation and intelligibility; vehicle acoustics
Recommended Prerequisites	
Propaedeutic Courses	
Teaching Format	Frontal lecture, excercises, experimental activities.
Mandatory Attendance	Recommended
Specific Educational Objectives and Learning Outcomes	Knowledge and understanding: 1. Knowledge of the calculation methods described in current technical standards for assessing the acoustic performance of buildings 2. Knowledge of current legislation on acoustic protection in buildings Ability to apply knowledge and understanding: 3. Ability to implement the procedures described in technical standards 4. Ability to develop design and diagnostic skills related to the acoustic protection of buildings 5. Ability to improve these skills in a real case study Independent judgement: 6. Students will be able to evaluate the acoustic performance of existing and new buildings, identify critical issues and suggest solutions Communication skills: 7. Students will be able to discuss the knowledge they have acquired using the vocabulary and technical terms related to the topic covered. Learning skills 8. Ability to engage in lifelong learning through the acquisition of critical tools and critical evaluation of project specifications.
Specific Educational Objectives and Learning Outcomes (additional info.)	

Assessment	Summative assessment Form 100% oral exam Length /duration 30 minutes ILOs assessed: 1, 2, 3, 4, 5, 6, 7, 8
Evaluation Criteria	A single final mark will take into account knowledge of the course content (max 15 points), the ability to apply the subject matter learned (max 5 points), the ability to summarise information (max 5 points), the accuracy of technical terms and clarity (max 5 points).
Required Readings	Teaching materials provided by the lecturer. Subject Librarian: David Gebhardi, David.Gebhardi@unibz.it and Ilaria Miceli, Ilaria.Miceli@unibz.it
Supplementary Readings	R. Spagnolo. *Manuale di acustica applicata* (Handbook of Applied Acoustics). Città Studi Edizioni, Turin, 2008. ISBN:9788825173208. H. Kuttruff. *Room acoustics*. Spoon Press, Abingdon (UK), 2007. ISBN10: 0-415-48021-3. C. Hopkins. Sound insulation. Butterworth-Heinemann, Burlington, MA (USA), 2007. ISBN: 978-0-7506-6526-1
Further Information	
Sustainable Development Goals (SDGs)	Industry, innovation and infrastructure, Good health and well-being