



1. General information

Course: NOISE AND VIBRATIONS

Type: CORE COURSE

Degree: 385 - DEGREE IN TELECOMMUNICATIONS TECHNOLOGY ENGINEERING

Center: 308 - SCHOOL POLYTECHNIC OF CUENCA

Year: 3

Main language: Spanish

Use of additional languages:

Web site:

Code: 59624

ECTS credits: 6

Academic year: 2020-21

Group(s): 30

Duration: C2

Second language:

English Friendly: Y

Bilingual: N

Lecturer: ISABEL GONZALEZ RODRIGUEZ - Group(s): 30

Building/Office	Department	Phone number	Email	Office hours
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2. Pre-Requisites

Having studied "Fundamentals of Physics I" and "Acoustic Engineering".

In particular, the student must have knowledge of electrical and acoustic magnitudes, sound field and acoustic waves propagation, intensity and sound power, laboratory instrumentation and basic analysis of acoustic signals.

3. Justification in the curriculum, relation to other subjects and to the profession

Techniques of evaluation and measurement of acoustic signals are developed, and in particular those related to the fields of environmental and occupational acoustics.

Knowledge applicable to studies of acoustic-environmental impact, occupational exposure to noise and vibrations, evaluation of noise and vibrations in the building or techniques of noise control and / or vibration control will be acquired.

4. Degree competences achieved in this course

Course competences

Code	Description
E24	The ability to conduct acoustic engineering projects on: isolation and acoustic conditioning of premises; public address system; specification, analysis and selection of electroacoustic transducers; measurement, analysis and control of noise and vibrations systems; environmental acoustics; underwater acoustics systems.
G02	Correct, oral and written, communication skills.
G03	Ethical commitment and professional ethics.
G05	Knowledge, understanding and ability to apply the necessary legislation during the development of the profession of Technical Telecommunications Engineer and being able to easily deal with specifications, regulations and mandatory regulations
G06	Knowledge of basic subjects and technologies, enabling students to learn new methods and technologies, as well as providing great versatility to adapt to new situations
G07	The ability to tackle problems with initiative, making decisions, creativity, and to communicate and transmit knowledge, skills and abilities, including the ethical and professional responsibility of the activity of a Technical Telecommunications Engineer
G08	Knowledge to perform measurements, calculations, assessments, appraisals, surveys, studies, reports, task planning and other similar work in their specific telecommunications field
G09	Being able to easily handle specifications, regulations and mandatory regulations
G10	The ability to analyse and assess the social and environmental impact of technical solutions
G11	Knowing and applying basic elements of economics and human resources management, organisation and planning of projects, as well as legislation, regulation and standardisation in telecommunications
G12	The ability to work in a multidisciplinary group and in a multilingual environment and to communicate, both in writing and orally, knowledge, procedures, results and ideas related to telecommunications and electronics
G13	The ability to look for and understand information, whether technical or commercial in different sources, to relate and structure it to integrate ideas and knowledge. Analysis, synthesis and implementation of ideas and knowledge.

5. Objectives or Learning Outcomes

Course learning outcomes

Description

Carrying out projects of: noise and vibration control, occupational exposure to noise and vibrations, acoustic characterization of sources and environmental acoustics.

Carrying out practical measurement of acoustic, noise and vibration parameters, insulation and conditioning.

Use of mandatory specifications, regulations and standards.

Mastery in the management and configuration of instruments, equipment and systems for acoustic signal measurements.

Interpretation of the general characteristics of acoustic transducers to know their right use and to choose the most suitable for each application.

Modeling of the main environmental noise sources.

Knowledge of the basic principles of noise source simulation models.

Knowledge of the propagation principles of noise and vibrations.

Knowledge of the physical principles of evaluation of acoustic signals of noise and vibrations and the parameters that characterize them.

Knowledge and selection of the main noise control techniques.

Analysis, synthesis and compression of technical documentation and mastery of specific vocabulary.

Knowledge of acoustic measurement techniques and selection criteria.

6. Units / Contents

Unit 1: Fundamentals of noise and vibrations

Unit 1.1 Definitions and parameters. Intensity and power

Unit 1.2 Fundamentals of noise control

Unit 1.3 Human response to sound and vibration

Unit 1.4 LAB 1 - Parameters and indicators

Unit 2: Instrumentation and measurements techniques

Unit 2.1 Transducers, sonometer and vibrometer

Unit 2.2 Measuring techniques. Noise

Unit 2.3 Measuring techniques. Vibration

Unit 2.4 LAB 2 - Noise and vibration measurements

Unit 3: Noise and vibration sources

Unit 3.1 Noise sources classification

Unit 3.2 Outdoor propagation

Unit 3.3 Sound power measurements techniques

Unit 3.4 LAB 3 - determination of sound power

Unit 4: Environmental noise

Unit 4.1 Community and environmental noise

Unit 4.2 Noise prediction models

Unit 4.3 Noise mapping

Unit 4.4 LAB 4 - Enviromental noise

Unit 5: Occupational noise

Unit 5.1 Noise and vibration exposure

Unit 5.2 Evaluation, prevention and control

Unit 5.3 LAB 5 - noise and vibration exposure

Unit 6: Final project

Unit 6.1 Planning and measurements

Unit 6.2 Report and presentation

Unit 6.3 LAB 6 - Final project

7. Activities, Units/Modules and Methodology							
Training Activity	Methodology	Related Competences (only degrees before RD 822/2021)	ECTS	Hours	As	Com	Description
Class Attendance (theory) [ON-SITE]	Lectures	E24 G02 G03 G05 G06 G10 G11	0.97	24.25	N	-	
Problem solving and/or case studies [ON-SITE]	Problem solving and exercises	E24 G05 G07 G08 G09 G10 G11 G12	0.48	12	N	-	
Laboratory practice or sessions [ON-SITE]	Practical or hands-on activities	E24 G02 G03 G05 G07 G08 G09 G10 G11 G12	0.8	20	Y	Y	
Practicum and practical activities report writing or preparation [OFF-SITE]	Group Work	E24 G02 G03 G05 G08 G09 G10 G11 G12	0.8	20	Y	Y	
Writing of reports or projects [OFF-SITE]	Combination of methods	E24 G02 G03 G05 G09 G10 G11 G12	1.2	30	Y	N	
Study and Exam Preparation [OFF-SITE]		E24 G02 G03 G06 G07 G08 G09 G10 G11 G12	1.6	40	N	-	
Individual tutoring sessions [ON-SITE]	Combination of methods	E24 G02 G03 G07 G09 G10 G11 G12	0.04	1	N	-	
Other on-site activities [ON-SITE]	Assessment tests	E24 G03 G05 G06 G07 G08 G09 G10 G11 G12	0.11	2.75	Y	Y	
Total:			6	150			
Total credits of in-class work: 2.4			Total class time hours: 60				
Total credits of out of class work: 3.6			Total hours of out of class work: 90				

As: Assessable training activity

Com: Training activity of compulsory overcoming (It will be essential to overcome both continuous and non-continuous assessment).

8. Evaluation criteria and Grading System			
Evaluation System	Continuous assessment	Non-continuous evaluation*	Description
Fieldwork assessment	20.00%	20.00%	Final project
Laboratory sessions	40.00%	20.00%	laboratory practices and its reports
Test	40.00%	40.00%	Evaluation test
Other methods of assessment	0.00%	20.00%	
Total:	100.00%	100.00%	

According to art. 4 of the UCLM Student Evaluation Regulations, it must be provided to students who cannot regularly attend face-to-face training activities the passing of the subject, having the right (art. 12.2) to be globally graded, in 2 annual calls per subject, an ordinary and an extraordinary one (evaluating 100% of the competences).

Evaluation criteria for the final exam:

Continuous assessment:

In order to pass, it is necessary to obtain a minimum grade of 4.0 points in each of the compulsory activities (evaluation tests and laboratory practices), and obtain a minimum of 5.0 in the final assessment.

Non-continuous evaluation:

Evaluation criteria not defined

9. Assignments, course calendar and important dates	
Not related to the syllabus/contents	
Hours	hours
Writing of reports or projects [AUTÓNOMA][Combination of methods]	30
Study and Exam Preparation [AUTÓNOMA][]	40
Individual tutoring sessions [PRESENCIAL][Combination of methods]	1
Other on-site activities [PRESENCIAL][Assessment tests]	2.75
Unit 1 (de 6): Fundamentals of noise and vibrationsF	
Activities	Hours
Class Attendance (theory) [PRESENCIAL][Lectures]	4
Problem solving and/or case studies [PRESENCIAL][Problem solving and exercises]	2
Laboratory practice or sessions [PRESENCIAL][Practical or hands-on activities]	3
Practicum and practical activities report writing or preparation [AUTÓNOMA][Group Work]	4
Unit 2 (de 6): Instrumentation and measurements techniques	
Activities	Hours
Class Attendance (theory) [PRESENCIAL][Lectures]	4
Problem solving and/or case studies [PRESENCIAL][Problem solving and exercises]	1
Laboratory practice or sessions [PRESENCIAL][Practical or hands-on activities]	4.5
Practicum and practical activities report writing or preparation [AUTÓNOMA][Group Work]	4
Unit 3 (de 6): Noise and vibration sources	
Activities	Hours
Class Attendance (theory) [PRESENCIAL][Lectures]	4.25
Problem solving and/or case studies [PRESENCIAL][Problem solving and exercises]	2.5
Laboratory practice or sessions [PRESENCIAL][Practical or hands-on activities]	3
Practicum and practical activities report writing or preparation [AUTÓNOMA][Group Work]	4
Unit 4 (de 6): Environmental noise	
Activities	Hours
Class Attendance (theory) [PRESENCIAL][Lectures]	6
Problem solving and/or case studies [PRESENCIAL][Problem solving and exercises]	2.5
Laboratory practice or sessions [PRESENCIAL][Practical or hands-on activities]	3.5
Practicum and practical activities report writing or preparation [AUTÓNOMA][Group Work]	4
Unit 5 (de 6): Occupational noise	
Activities	Hours
Class Attendance (theory) [PRESENCIAL][Lectures]	4.5
Problem solving and/or case studies [PRESENCIAL][Problem solving and exercises]	2.5
Laboratory practice or sessions [PRESENCIAL][Practical or hands-on activities]	3
Practicum and practical activities report writing or preparation [AUTÓNOMA][Group Work]	4
Unit 6 (de 6): Final project	
Activities	Hours
Class Attendance (theory) [PRESENCIAL][Lectures]	1.5
Problem solving and/or case studies [PRESENCIAL][Problem solving and exercises]	1.5
Laboratory practice or sessions [PRESENCIAL][Practical or hands-on activities]	3
Global activity	
Activities	hours
Laboratory practice or sessions [PRESENCIAL][Practical or hands-on activities]	20
Writing of reports or projects [AUTÓNOMA][Combination of methods]	30
Other on-site activities [PRESENCIAL][Assessment tests]	2.75

Class Attendance (theory) [PRESENCIAL][Lectures]	24.25
Problem solving and/or case studies [PRESENCIAL][Problem solving and exercises]	12
Practicum and practical activities report writing or preparation [AUTÓNOMA][Group Work]	20
Study and Exam Preparation [AUTÓNOMA][]	40
Individual tutoring sessions [PRESENCIAL][Combination of methods]	1
Total horas: 150	

10. Bibliography and Sources						
Author(s)	Title/Link	Publishing house	Citv	ISBN	Year	Description
1_instrumentación	equipamiento de medida y análisis del laboratorio de acústica (analizadores bicanales, sonómetros, vibrómetros, etc.)					Normas disponibles en biblioteca UCLM
AENOR	Normas ISO-AENOR(NorWeb) http://biblioteca.uclm.es/bases_datos_lista.html					
Malcolm J. Crocker	Handbook of noise and vibration control	John Wiley & Sons		978-0-471-39599-7	2007	
Amando García	La contaminación acústica : fuentes, evaluación, efectos y c	Sociedad Española de Acústica	Madrid	84-87985-10-6	2006	
Cyril Harris	Manual de medidas acústicas y control del ruido	McGraw-Hill	Madrid	84-481-1619-4	1998	
Carmen Álvarez Brime	La exposición laboral al ruido	Instituto Nacional de Seguridad e Higiene en Madrid el		84-7425-461-2	2001	
1_software	porgramas de medida y análisis de señales acústicas (dBTrait, dBTrig, Evaluator, Noise explorer, etc)					
Frank Fahy y David Thomspon (ed)	Fundamentals of sound and vibration	CRC Press		978-0-415-56210-2	2015	