

Academic Year: (2023 / 2024)

Review date: 15-01-2024

Department assigned to the subject: Mechanical Engineering Department

Coordinating teacher: RUBIO ALONSO, HIGINIO

Type: Compulsory ECTS Credits : 6.0

Year : 1 Semester : 2

REQUIREMENTS (SUBJECTS THAT ARE ASSUMED TO BE KNOWN)

Knowledge of Mechanics and its fundamental laws, as well as mathematics at the grade level or higher.

OBJECTIVES

The students will solve noise and vibration problems.

They will learn to minimize sources of noise and vibrations in machinery and to calculate their propagation.

They will learn to design airborne soundproofing, antivibration benches, acoustic barriers, reactive and passive silencers and absorbent systems for acoustic conditioning.

They will use instruments and equipment for measurement and generation: accelerometers, filters, piezoelectric actuators, acquisition and processing systems, microphones, sound level meters or loudspeakers.

They will learn the fundamentals of isolation and passive and active control of vibrations and noise.

DESCRIPTION OF CONTENTS: PROGRAMME

1. INTRODUCTION.
2. BASIS OF SOUND.
3. MEASUREMENT OF NOISE.
4. NOISE CONTROL. INSULATION.
5. NOISE REGULATIONS.
6. FUNDAMENTALS OF VIBRATIONS.
7. MEASUREMENT OF VIBRATIONS.
8. VIBRATIONS IN MACHINES.
9. NONLINEAR VIBRATIONS.
10. REGULATIONS AND NOISE CONTROL.
11. MODAL ANALYSIS.

LEARNING ACTIVITIES AND METHODOLOGY

- Theoretical and practical Classes (45% ECTS) . Students learn the theoretical contents of the subject and its application to practical situations.
- Labs (10% ECTS). The student reinforces their knowledge with practical implementation in lab situations.
- Practical work (40% ECTS). The student demonstrates the ability to apply knowledge acquired in the classroom to a real course.
- Participation in conferences, seminars or subject-related conferences (5% ECTS). Students acquire a thorough knowledge of the subject and its relation to other adjacent areas.

ASSESSMENT SYSTEM

% end-of-term-examination:	40
% of continuous assessment (assignments, laboratory, practicals...):	60

Final exam (40%).

- The theoretical contents and practical exercises of the subject program will be evaluated.
- It is mandatory to obtain a grade higher than 3.5 / 10 to assess the continuous assessment and pass

% end-of-term-examination:	40
% of continuous assessment (assignments, laboratory, practicals...):	60

the course.

* This qualification may be increased by the excellence of the practical exercises delivered.

Continuous assessment (60%).

- A theoretical or experimental work related to the subject contents will be carried out.
- The work will be carried out under the supervision of the subject teachers.
- Students must record the work results in a written report and a public presentation.
- Additionally, practical exercises will be delivered that may increase the grade.
- It is mandatory to obtain a grade higher than 3.5 / 10 to assess with the final exam and pass the course.

Extraordinary examination.

- For the extraordinary call, the most favorable grade will be taken between:
 - > 40% of the extraordinary exam + 60% continuous assessment.
 - > The grade of the extraordinary exam.
- No additional practical work may be submitted.

BASIC BIBLIOGRAPHY

- Den Hartog, J.P. Mechanical vibrations , Dover, 1985
- Kinsler, Lawrence E. Fundamentals of acoustics 3rd ed, John Wiley & Sons, 1982
- Rao, S.S. Mechanical vibrations , Addison-Wesley, 1990
- Rossing, Thomas D. Handbook of acoustics , Springer, 2007
- Smith, B.J. Acoustics and noise control , Addison-Wesley, 1996