Course guides
820451 - AVM - Acoustics and Vibrations

Last modified: 02/06/2015

Unit in charge: Barcelona East School of Engineering
Teaching unit: 712 - EM - Department of Mechanical Engineering.

Degree: BACHELOR'S DEGREE IN MECHANICAL ENGINEERING (Syllabus 2009). (Optional subject).

Academic year: 2015 **ECTS Credits:** 6.0 **Languages:** Catalan, Spanish

LECTURER

Coordinating lecturer: EVA MARTINEZ GONZALEZ

Others: EVA MARTINEZ GONZALEZ

PRIOR SKILLS

Knowledge of mechanics.

DEGREE COMPETENCES TO WHICH THE SUBJECT CONTRIBUTES

Transversal:
1. SELF-DIRECTED LEARNING - Level 3. Applying the knowledge gained in completing a task according to its relevance and importance. Deciding how to carry out a task, the amount of time to be devoted to it and the most suitable information sources.

TEACHING METHODOLOGY

The subjet consists of clases of theory and laborator clases. To the classes of theory there are included problems that help to understand the concepts and to his application to royalcases. The laborator practices are related to important concepts of theory and are realized using sales teams of last generation.
The methodology of work is base don the work on group. Initially of course there are formed the Workgroups, maximun of five persons that top art of being groups for the laborator meetings, also deberán to solve problems and cases that iran delivering along the course.
To part, the course complements itself with chats and professionals presentations of the sector.

LEARNING OBJECTIVES OF THE SUBJECT

The study and Knowledge of the theory of the vibrations is of his stability and to assure his movement is of great application inside the field of activitis of the engineering especially. The vibratory analysis must be applied to machinery and facilities to guarantee his stability and to assure his maintenance.Also it is important from the point of view of comfort and affectation of workers or of users in general or of users.
The acústica is related to the vibrations because the sound is the perception of the vibration of the air, and also this one is a factor with increasing interest in the company and consequence, in the Engineering. For an engineer is important to understand the physical phenomena of generation and spread of the vibrations and the sound, to be able to use the equipments of measure and the procedurs and existing tools of calculation and finally, apply technologies of control of noise and vibrations.Then, the principal aims are:
- Comprehension of the physical phenomena that intervene
- Knowledge of the technologies of calculation and measure
- Recognition of the best solutions opposite to a vibroacoustic problem.

STUDY LOAD

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

Total learning time: 150 h

CONTENTS

(ENG) Vibracions

Description:
(ENG) 1.1. Vibracions mecàniques d'un grau de libertad. Vibració forçada, ressonància, aïllament de vibracions.
1.2. Equació de Lagrange per a sistemes conservatius i no conservatius.
1.3. Dos graus de libertad. Modos propio. Equacions del moviment
1.4. Aïllament de vibracions
1.5 Anàlisis de senyal dinàmica:anàlisi de Fourier, quantificació de les magnituds mesurable.
1.6. Mesura i anàlisis de vibracions per determinació l'estat i comportament d'una estructura o màquina.

Specific objectives:
(ENG) Coneixement dels fenòmens físic que determinen la vibració en sòlidos. Presentació dels procediments i equips de mesura habituals. Solució de problemes teòrics i pràctics. Implicacions ambientals i legals.

Full-or-part-time: 82 h
Theory classes: 30h
Laboratory classes: 7h 30m
Self study : 45h

(ENG) Acústica

Full-or-part-time: 82 h
Theory classes: 30h
Laboratory classes: 7h 30m
Self study : 45h

GRADING SYSTEM

Exam 1: 25 %
Exam 2: 25 %
Exercices/Reports: 25 %
Guided activities: 25%

EXAMINATION RULES.

The procedure and instructions for the accomplishment of the tests will be specified for each of them.