Machines Technology

Academic Year: (2019 / 2020) **Review date: 06-05-2020**

Department assigned to the subject: Department of Mechanical Engineering

Coordinating teacher: OLMEDA SANTAMARIA, ESTER

Type: Compulsory ECTS Credits : 6.0

Year : 3 Semester : 2

STUDENTS ARE EXPECTED TO HAVE COMPLETED

- Elasticity and strength of materials
- Mechanics of Structures

COMPETENCES AND SKILLS THAT WILL BE ACQUIRED AND LEARNING RESULTS.

- Acquire an overview of the working methods used in mechanical design.
- Form criteria on the selection of materials, application of failure theories, choice of the safety factor and, in general, of the factors that influence the design and dimensioning of the elements and enable decision making.
- To know the concept of tribological phenomenon and its industrial solutions.

DESCRIPTION OF CONTENTS: PROGRAMME

1. Introduction of machine design.
2. Design for static strength. Failure theories.
3. Design by fatigue.
3.1 Fatigue´s theory (Goodman, Soderberg, Gerber)
3.2 Shaft theory
4. Gears
4.1 Gear transmission calculation
4.2 Gear fatigue
5. Tribology and Lubrication.
6. Belts transmission calculation
7. Brakes and clutches
7.1 Drum brakes
7.2 Disc brakes
7.3 Clutches
8. Roller bearings

LEARNING ACTIVITIES AND METHODOLOGY

- Master classes and, where appropriate, classes to resolve doubts in small groups, presentations of students, individual tutorials and personal work of the student, aimed at acquiring theoretical knowledge.
- Lab practices and problem classes in small groups, individual tutorials and personal work of the student; oriented to the acquisition of practical skills related to the program of the subject.

ASSESSMENT SYSTEM

The student will be assessed according to the Bologna criteria. Specifically, the continuous evaluation will be carried out by means of a four-monthly work, as well as a final examination. In order to pass the subject, the student must obtain a total score equal to or greater than 5, having to obtain in the final exam a minimum score of 3.5 out of 10.
Percentage weight of the Final Exam: 50%.
Percentage weight of the rest of the continuous evaluation: 50%.
The accomplishment and overcoming of the practices of laboratory is obligatory to approve the subject.
Those students who do not take the practices and go directly to the extraordinary exam will have to take a practice exam. Continuous assessment cannot be made up.

% end-of-term-examination:	50
% of continuous assessment (assigments, laboratory, practicals…):	50

BASIC BIBLIOGRAPHY

- Bernard J. Hamrock et al Elementos de máquinas, McGraw-Hill, 2000
- J.I. Pedrero TECNOLOGÍA DE MÁQUINAS (TOMO 1), UNED.
- R. Aviles Análisis de fatiga en máquinas, Thomson, 2005
- Richard G. Budynas y J. Keith Nisbett Diseño en ingeniería mecánica de Shigley, Mc Graw Hill, 2008