

Machine testing techniques

Academic Year: (2023 / 2024)

Review date: 10/07/2023 11:53:00

Department assigned to the subject: Mechanical Engineering Department

Coordinating teacher: MARIN PLAZA, PABLO

Type: Electives ECTS Credits : 6.0

Year : 4 Semester :

REQUIREMENTS (SUBJECTS THAT ARE ASSUMED TO BE KNOWN)

- Machine Mechanics
- Production systems and manufacturing technologies
- Machines Technology

LEARNING OUTCOMES

CB1. Students have demonstrated possession and understanding of knowledge in an area of study that builds on the foundation of general secondary education, and is usually at a level that, while relying on advanced textbooks, also includes some aspects that involve knowledge from the cutting edge of their field of study

CB2. Students are able to apply their knowledge to their work or vocation in a professional manner and possess the competences usually demonstrated through the development and defence of arguments and problem solving within their field of study.

CB3. Students have the ability to gather and interpret relevant data (usually within their field of study) in order to make judgements which include reflection on relevant social, scientific or ethical issues.

CB5. Students will have developed the learning skills necessary to undertake further study with a high degree of autonomy.

CG1. Ability to solve problems with initiative, decision-making, creativity, critical reasoning and to communicate and transmit knowledge, skills and abilities in the field of Industrial Engineering.

CG3. Ability to design a system, component or process in the field of Industrial Technologies to meet the required specifications

CG4. Knowledge and ability to apply current legislation as well as the specifications, regulations and mandatory standards in the field of Industrial Engineering.

CG5. Adequate knowledge of the concept of company, institutional and legal framework of the company. Organisation and management of companies.

CG6. Applied knowledge of company organisation.

CG8. Knowledge and ability to apply quality principles and methods.

CG9. Knowledge and ability to apply computational and experimental tools for the analysis and quantification of Industrial Engineering problems.

RA1. Knowledge and understanding: Have basic knowledge and understanding of science, mathematics and engineering within the industrial field, as well as knowledge and understanding of Mechanics, Solid and Structural Mechanics, Thermal Engineering, Fluid Mechanics, Production Systems, Electronics and Automation, Industrial Organisation and Electrical Engineering.

RA2. Engineering Analysis: To be able to identify engineering problems within the industrial field, recognise specifications, establish different resolution methods and select the most appropriate one for their solution

RA3. Engineering Design: To be able to design industrial products that comply with the required specifications, collaborating with professionals in related technologies within multidisciplinary teams.

RA4. Research and Innovation: To be able to use appropriate methods to carry out research and make innovative contributions in the field of Industrial Engineering.

RA5. Engineering Applications: To be able to apply their knowledge and understanding to solve problems and design devices or processes in the field of industrial engineering in accordance with criteria of cost, quality, safety, efficiency and respect for the environment.

RA6. Transversal Skills: To have the necessary skills for the practice of engineering in today's society.

OBJECTIVES

- ¿ Acquire a global vision of different techniques involved in mechanical testing design
- ¿ Train up criteria on technique selection to apply mechanical actions to a system
- ¿ Know different instrumentation systems for testing data acquisition

DESCRIPTION OF CONTENTS: PROGRAMME

- 1.- Instrumentation systems
 - Transducers fundamental aspects
 - Extensometers
 - Accelerometers
 - Load cells
 - Signal conditioners
 - Recording techniques
- 2.- Driving systems
 - Pneumatic actuators
 - Pneumatic valves
 - Pneumatic circuits
 - Electro-pneumatic systems
 - Electronic control
- 3.- Universal testing machines
- 4.- Vibration tests

ASSESSMENT SYSTEM

% end-of-term-examination/test:	50
% of continuous assessment (assignments, laboratory, practicals...):	50

The student will be evaluated following the Bologna criteria. Specifically, continuous evaluation will be carried out through a course project, as well as a final exam will be carried out. To pass the course, the student must obtain a total score equal to or greater than 5, having to obtain a minimum mark of 3.5 out of 10 in the final exam.

Percentage of the Final Exam: 50%.

Percentage of the course project: 50%

The completion and passing of the laboratory practices is mandatory to pass the course.

Those students who do not take the practical lessons and go directly to the extraordinary exam must pass a practical exam.