Specialized Techniques in Machine Testing and calculation

Academic Year: (2023 / 2024) **Review date: 27-04-2023**

Department assigned to the subject: Mechanical Engineering Department

Coordinating teacher: ALVAREZ CALDAS, CAROLINA

Type: Compulsory ECTS Credits : 4.0

Year : 1 Semester : 1

OBJECTIVES

- Knowing different engineering test methods
- Learning the theoretical basis of different tests methods.
- Knowing the posibilities and the limitations of these test methods.
- Knowing what is a virtual test and its relation with real tests.
- Quantifying the reliability of the results of a virtual test by calculating its uncertainty.

DESCRIPTION OF CONTENTS: PROGRAMME

1. Test techniques in Mechanical Engineering.
2. Strain experimental measuring: strain gauges.
3. Strain experimental measuring: fotoelasticity.
4. Virtual tests.
5. Simulation techniques uncertainty (FEM)

LEARNING ACTIVITIES AND METHODOLOGY

The training activities include:
- Lectures, where the theoretical concepts are presented. Students will receive lecture notes and key reference texts to help them follow the classes.
- Lab classes, where students experimentally verify the theoretical concepts and results seen in class.

ASSESSMENT SYSTEM

The qualification of the subject will be distributed among the final exam and continuous assessment.
Percentages may vary, according to the difficulty of the continuous assesment, within the ranges: 40%-70% (continuous assesment) y 60%-30% (final exam).
Also, the lab classes are compulsory to pass the subject.

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

ADDITIONAL BIBLIOGRAPHY

- Centro Español de Metrología Guía para la expresión de la incertidumbre de medida, Centro Español de Metrología , 2008
- Chandrupatla, Tirupathi R.; Belegundu, Ashok D. Introduccio¿n al estudio del elemento finito en ingenieri¿a, Pearson Educación, 1999
- Dally, James W Experimental stress analysis, McGraw-Hill Inc., 1991
- Moaveni, Saeed Finite element analysis: theory and application with Ansys, FINANCIAL TIMES/PRENTICE HALL, 2003
- Nakasone, Y; Yoshimoto, S; Stolarski, T. A Engineering analysis with ANSYS software, Elsevier, 2006