Test of materials and their quality management

Academic Year: (2019 / 2020) **Review date: 10-05-2018**

Department assigned to the subject: Materials Science and Engineering and Chemical Engineering Department

Coordinating teacher: VAREZ ALVAREZ, ALEJANDRO

Type: Electives ECTS Credits : 6.0

Year : 4 Semester :

REQUIREMENTS (SUBJECTS THAT ARE ASSUMED TO BE KNOWN)

Materials Science and Engineering

OBJECTIVES

- Ability to search the most adequate testing techniques in the field of materials
- Ability to understand and differentiate the relevant information from a test/calibration report to take a decision, in the field of Materials Science and Engineering.
- Ability to use multi-disciplinary knowledge to deal with a problem.
- Ability to work in groups and ditribute the work to deal with complex problems.
- Ability to extrapolate quality processes of materials and the standards related to materials to other engineering disciplines.

DESCRIPTION OF CONTENTS: PROGRAMME

1. Standards and Product Certification
2. National Accreditation Body
3. Testing Laboratories and ISO 17025 accreditation.
4. Chemical Testing: Wet and dry way. Spectroscopic techniques.
5. Tests on Plastic Materials
6. Tests on Adhesives
7. Metallurgical Testing
8. Ceramic Testing
9. Tests on Powder Metallurgy
10. Tests on Composite Materials
11. Calibration Equipment
12. Estimation of uncertainty in Calibration and in Test

LEARNING ACTIVITIES AND METHODOLOGY

- Teaching classes.
- Class exercises.
- Lab practices.

ASSESSMENT SYSTEM

- Final exam: 60%.
- Lab practices: 15%
- Class exercises: 25%.

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

BASIC BIBLIOGRAPHY

- null CGA-ENAC-LEC Rev. 6 Octubre 2014. Criterios Generales para la acreditación de Laboratorios de Ensayo y Calibración según Norma UNE-EN-ISO/IEC 17025 (Octubre 2014, ENAC. Entidad Nacional de Acreditación, 2014

- null Guide to the expression of Uncertainty in Measurement. Guia GUM , BIPM-Bureau International des Poids et Mesures, 2008

- Norma UNE-EN ISO/IEC 17025:2005.- Evaluación de la conformidad. Requisitos generales para la competencia de los laboratorios de ensayo y de calibración., AENOR, 2005

- Douglas A. Skoog, F. James Holler, Timothy A. Nieman PRINCIPIOS DE ANALISIS INSTRUMENTAL, MC GRAW HILL INTERAMERICANA, 2000
- Jordi Riu, Ricard Boqué, Alicia Maroto, F. Xavier Rius ¿Determinación de la trazabilidad en medidas físicas¿ , Técnicas de Laboratorio , 2000
- María Rosa Gómez Antón Ensayos en materiales polímeros. Plásticos y cauchos, Universidad Nacional de Educación a Distancia, 2009
- Vicente Alvarez García La Normalización Industrial, Tirant lo Blanch, Universitat de Valencia, 1999

ADDITIONAL BIBLIOGRAPHY

- CEM PROCEDIMIENTO TH- 003 PARA LA CALIBRACIÓN POR COMPARACIÓN DE TERMOPARES, CEM-Centro Nacional de Metrologia.
- CEM PROCEDIMIENTO ME-005 PARA LA CALIBRACIÓN DE BALANZAS MONOPLATO, CEM-Centro Español de Metrología.
- J. Goldstein, D. E. Newbury, D.C. Joy, C.E. Lyman, P. Echlin, E. Lifshin, L.C. Sawyer, J.R. Michael Scanning Electron Microscopy and X-ray Microanalysis, Plenum US, 2003