

Academic Year: (2022 / 2023)

Review date: 20-06-2022

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

Coordinating teacher: BAUTISTA ARIJA, MARIA ASUNCION

Type: Electives ECTS Credits : 6.0

Year : 4 Semester :

DESCRIPTION OF CONTENTS: PROGRAMME

1. WEAR
 - 1.1 Wear mechanisms.
 - 2.2 Evaluation of wear performance.
2. CORROSION
 - 2.1 Corrosion in gases at high temperature.
 - 2.2 Thermodynamics of aqueous corrosion.
 - 2.3 Mechanisms and kinetics of general and galvanic corrosion.
 - 2.4 Types of localized corrosion and probabilistic studies.
 - 2.5 Types of corrosion determined by metallurgical factors.
 - 2.6 Accelerated tests and their evaluation.
3. METHODS OF PROTECTION AGAINST CORROSION
 - 3.1 Modification of the environment: corrosion inhibitors.
 - 3.2 Cathodic protection
 - 3.3 Anodic protection.
4. SURFACE PREPARATION
 - 4.1 Mechanical preparation.
 - 4.2 Degreasing treatments.
 - 4.3 Pickling treatments.
5. COATINGS
 - 5.1 Metallic coatings by immersion.
 - 5.2 Metallic coatings by plating.
 - 5.3 Metallic coatings by electroless chemical deposition.
 - 5.4 PVD and CVD coatings.
 - 5.5 Thermal spray coatings.
 - 5.6 Diffusion surface treatments.
 - 5.7 Conversion coatings: chemical processes and anodizing.
 - 5.8 Organic coatings

LEARNING ACTIVITIES AND METHODOLOGY

- AF1. THEORETICAL-PRACTICAL CLASSES. Knowledge and concepts students must acquire. Receive course notes and will have basic reference texts. Students partake in exercises to resolve practical problems
- AF2. TUTORING SESSIONS. Individualized attendance (individual tutoring) or in-group (group tutoring) for students with a teacher. Subjects with 6 credits have 4 hours of tutoring/ 100% on-site attendance.
- AF3. STUDENT INDIVIDUAL WORK OR GROUP WORK. Subjects with 6 credits have 98 hours/0% on-site.
- AF8. WORKSHOPS AND LABORATORY SESSIONS. Subjects with 3 credits have 4 hours with 100% on-site instruction. Subjects with 6 credits have 8 hours/100% on-site instruction.
- AF9. FINAL EXAM. Global assessment of knowledge, skills and capacities acquired throughout the course. It entails 4 hours/100% on-site
- AF8. WORKSHOPS AND LABORATORY SESSIONS. Subjects with 3 credits have 4 hours with 100% on-site instruction. Subjects with 6 credits have 8 hours/100% on-site instruction.
- MD1. THEORY CLASS. Classroom presentations by the teacher with IT and audiovisual support in which the subject's main concepts are developed, while providing material and bibliography to complement student learning
- MD2. PRACTICAL CLASS. Resolution of practical cases and problem, posed by the teacher, and carried out individually or in a group
- MD3. TUTORING SESSIONS. Individualized attendance (individual tutoring sessions) or in-group (group tutoring sessions) for students with teacher as tutor. Subjects with 6 credits have 4 hours of tutoring/100% on-site.

MD6. LABORATORY PRACTICAL SESSIONS. Applied/experimental learning/teaching in workshops and laboratories under the tutor's supervision.

ASSESSMENT SYSTEM

SE1. FINAL EXAM. Global assessment of knowledge, skills and capacities acquired throughout the course. The percentage of the evaluation varies for each subject between 60% and 0%.

SE2. CONTINUOUS EVALUATION. Assesses papers, projects, class presentations, debates, exercises, internships and workshops throughout the course. The percentage of the evaluation varies for each subject between 40% and 100% of the final grade.

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