

28821 - Manufacturing Process I

Syllabus Information

Academic year: 2023/24

Subject: 28821 - Manufacturing Process I

Faculty / School: 175 - Escuela Universitaria Politécnica de La Almunia

Degree: 424 - Bachelor's Degree in Mechatronic Engineering

ECTS: 6.0

Year: 3

Semester: First semester

Subject type: Compulsory

Module:

1. General information

The great variety of objects, parts, products, etc. on the market have been obtained through a more or less complex production process. This subject provides the keys to determine some of them.

A product has specifications of finish, precision, etc. that are in accordance with its function. Harmonizing the functionality of the product with sufficient quality criteria, facilitates the task of selecting a certain production process.

Every manufactured component has a life and a cost, relating these variables and that the component fulfills its function with guarantee is a challenge to achieve. Selecting a production process is the overall objective of the subject.

These approaches and objectives are aligned with the following Sustainable Development Goals (SDGs) of the United Nations Agenda 2030 (<https://www.un.org/sustainabledevelopment/es/>), such that the acquisition of the learning results of the subject provides training and competence to contribute to some extent to their achievement." Goal 9: Industry, Innovation and Infrastructure

2. Learning results

- Know the behavior and technology of materials.
- Select and design the appropriate manufacturing process for a mechanical element.
- Drawing and interpreting plans and diagrams according to the appropriate standards and symbology.

3. Syllabus

THEORETICAL CONTENTS:

Topic 1. Metrology.

Introduction to Metrology. Measuring instruments: Direct and indirect measurements. Surface roughness. Tolerances and adjustments.

Topic 2. Process Quality Control.

Process capability studies. Control charts.

Topic 3. Molding.

Fundamentals of Metal Casting. Metal Smelting Processes. Technical and Economic Considerations.

Topic 4. Joining and assembly processes.

Fusion welding. Solid state welding. Welding metallurgy, design, quality and testing. Hard and soft welding. Bonding with adhesives. Mechanical fastening.

Topic 5. Machining.

Classification of processes. Non-conventional processes.

PRACTICAL CONTENTS:

- Thread and gear control. Angle and taper measurement.
- Verification of tolerances (dimensional and geometrical) on shaft, depths, distance between holes.
- Measurement and sketching of a component.
- Roughness: Evaluate different surfaces.
- Practical realization of a joining system.

4. Academic activities

Theoretical/practical classes and laboratory practices. They will be developed at a rate of four hours per week, until completing

the 60 hours necessary to cover the syllabus.

Theoretical/practical classes: The theoretical concepts of the subject will be explained and problems or practical cases will be solved posed by the teacher.

Laboratory practices: They will be carried out in subgroups adapted to the capacity of the laboratory. Students will perform tests and measurements, in the metrology laboratory in the presence of the teacher. The practices are carried out in pairs.

Study and personal work: Study of theory and problems, resolution of exercises, quizzes and completion of documentation. 90 hours

5. Assessment system

Continuous assessment system

Laboratory practices: The report delivered individually at the end of the activity will be assessed. Each practice should have a minimum grade of 3. The grade will be the arithmetic mean. (20% of the grade, minimum 4 out of 10)

Proposed exercises and theoretical questions: Proposed by the teacher and to be solved individually or in groups according to the case. Each exercise must have a minimum score of 3. The grade will be the arithmetic mean. (10% of the grade, minimum 4 out of 10)

Written assessment tests: Written tests with theory questions and problems. Qualification: arithmetic average of said tests, provided that there is no unit score below 4 points. (70% of the grade, minimum 4 out of 10)

The grade to pass the subject after weighting must be equal to or higher than 5.

In order to be eligible for the continuous assessment system, students must attend at least 80% of the classroom activities.

- Global assessment system

Written test of theory and problems: (85% of the grade, minimum 5 out of 10)

Written test of laboratory practices: (15% of the grade, minimum 5 out of 10). If the practices have been passed in Continuous Assessment (grade equal or higher than 5), the grade may be promoted, being exempted from the completion of this part.

The grade to pass the subject after weighting must be equal to or higher than 5.