

30120 - Manufacturing Technology

Syllabus Information

Academic year: 2023/24

Subject: 30120 - Manufacturing Technology

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

Degree: 425 - Bachelor's Degree in Industrial Organisational Engineering

ECTS: 6.0

Year: 2

Semester: Second 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

- Acquire a broad knowledge base based on scientific, technological and economic criteria on the different manufacturing processes and systems.
- Identify their advantages and disadvantages, as well as the defects that may be present in their application, the means to control and avoid them.
- Select the most suitable manufacturing processes based on the knowledge of their capabilities and limitations and according to the technological, technical and economical requirements of the product and the market.
- Recognize and applies the basic considerations for setting up a process sheet
- Interpret metrological control guidelines used to ensure the quality of products and processes
- Know the different existing automation systems and levels, selecting the most appropriate one according to the productivity and flexibility criteria
- Know industrial quality models and is capable of integrating manufacturing and measurement functions into these models.
- Acquire a critical attitude towards solutions already used, so as to encourage him/her to deepen the study and analysis of the topics covered in this discipline and to propose innovative strategies.

3. Syllabus

Theoretical contents

Topic 1. Metrology.

Introduction to Metrology. Measuring instruments. Surface roughness. Tolerances and adjustments.

Topic 2. Process Control.

Process capability studies. Control charts.

Topic 3. Molding.

Fundamentals of Metal Casting. Metal smelting processes.

Topic 4. Plastic Deformation.

Metal rolling and forging. Extrusion and drawing of metals. Operations on sheet metal.

Topic 5. Joining and Assembly Processes.

Bonding processes. Metallurgy and welding processes.

Topic 6. Machining by chip removal.

Fundamentals of metal machining. Machine tools.

Practical contents

- Thread control .
- Gear control.
- Angle and taper measurement.
- Verification of roughness, control of shaft tolerances, measurement of depths, distance between holes.
- Measurement and sketching of a mechanical component.

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. 90hours

5. Assessment system

- Continuous assessment system

Laboratory practices: The report delivered individually at the end of the activity will be assessed. Minimum grade of 3 for each practice. 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. Grading: arithmetic mean of all exercises. (10% of the grade, minimum 4 out of 10)

Written assessment tests: 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.

To be eligible for the Continuous Assessment system, students must attend at least 80% of the classroom activities.

- Global assessment test:

Written examination: Test with theory questions and problems on the topics explained throughout the term. (85% of the grade, minimum 5 out of 10)

Laboratory practical exam: Written test on the content of the practices carried out during the term. (15% of the grade, minimum 5 out of 10)

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

If the Laboratory Practicals have been passed in Continuous Assessment (grade equal or higher than 5), the student will be able to promote the grade, being exempted from the Laboratory Practicals exam.