

28821 - Manufacturing Processes I

Syllabus Information

Academic Year: 2019/20

Subject: 28821 - Manufacturing Processes 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

1.1.Aims of the course

The great variety of objects, pieces, products ... that there are in the market have been obtained through a more or less complex production process. This course provides the keys to determine some of them. Selecting a production process is a global objective in the course.

A product has finish, precision specifications ... which are consistent with its function. Adapting the functionality of the product with criteria of sufficient quality makes the task of selecting a specific production process easier.

All manufactured components have a life and a cost. Connecting these variables and get the component to fulfil its function with the guarantee is a challenge to achieve.

Selecting a production process is the overall aim of the course.

1.2.Context and importance of this course in the degree

Each course of the degree aims at covering a field in the Technological and Scientific training of the student, in this case, the selection of a process. Success at completing this task will condition the viability of the product, both technically and economically.

Directing and managing a company, or a part of it, and the manufacturing processes of an industrial component, mechanism or machine adequately, is the objective that this subject seeks to cover.

Taking part in the design of components, suggesting improvements and alternatives, which, meeting the specific objectives, have a lower cost, weight ... is also an objective to achieve.

1.3.Recommendations to take this course

There are no particular requirements to take this course. However, the contents to be taken will require the skills and abilities acquired, mainly, in the subjects of Technical Drawing, Statistics, Physics, Mathematics and Materials Engineering.

2.Learning goals

2.1.Competences

2.2.Learning goals

2.3.Importance of learning goals

3.Assessment (1st and 2nd call)

3.1.Assessment tasks (description of tasks, marking system and assessment criteria)

4.Methodology, learning tasks, syllabus and resources

4.1.Methodological overview

The methodology followed in this course is oriented towards the achievement of the learning objectives. A wide range of teaching and learning tasks are implemented, such as:

1. Lectures: Given to the whole group, basically given by the teacher, in such a way as to explain the theoretical supports of the subject.
2. Practice Sessions: The teacher solves problems or practical cases for illustrative purposes. This type of teaching complements the theory explained in the lectures with practical aspects.
3. Laboratory practice tasks. Students will carry out tests, measurements, joint assemblies, etc., in the workshop and in the laboratory in the presence of the trainee teacher.
4. Individual tutorials. On-site activities related to any issues of the subject at a specific agreed on time or via the Moodle virtual classroom.

4.2.Learning tasks

The course includes the following learning tasks:

- Theoretical/practical lessons. Two or four hours a week, until the 46 hours needed to cover the syllabus are completed.
- Lab practice tasks. Seven sessions will be held with two hours per session with subgroups adapted to the laboratory capacity.
- Study and personal work. This off-site part is given about 90 hours, necessary for the study of the theory, problem-solving and questionnaires, work production and revision of scripts.
- Tutorials and generic off-site activities. Each teacher will publish student service timetable throughout the four-month period

4.3.Syllabus

The course will address the following topics:

THEORETICAL CONTENTS:

- **Topic 1. Metrology.** Introduction to Metrology. Measuring Instruments: Direct and indirect measurements. Surface roughness. Tolerances and Fittings.
- **Topic 2. Process Quality Control.** Process Capability Studies. Control Charts.
- **Topic 3. Molding.** Fundamentals of metal casting. Metal-casting Processes. Technical and economic considerations.
- **Topic 4. Joint and assembly processes.** Fusion welding processes. Solid-state welding processes. Metallurgy of welding, design, and tests. Brazing, soldering. Adhesive bonding. Mechanical fastening.
- **Topic 5. Machining.** Classification of machining processes. Non-conventional machining processes.

PRACTICAL CONTENTS:

Mechanical elements Measurements:

- Control of threads and gears. Measurement of angles and conicity.
- Verification of tolerances (dimensional and geometric) in axis, depths, distance between holes
- Measurement and Sketching of a component.

Roughness: Evaluating different machined surfaces.

Practice tasks on welded and/or screwed joints:

Carry out a binding system in a practical way and report it.

4.4.Course planning and calendar

The lectures and problem lessons are taught in the timetable organized by the School, as well as the hours assigned to laboratory practice tasks.

For the students in the continuous evaluation system, the written test will be held at the end of each section.

The final dates will be announced during the scholar year in the Moodle.

The issues on which the presentations will be developed will be posted before the 10th week. The deadline will be the last teaching day of the subject.

The weekly schedule of the subject will be published at <http://www.eupla.unizar.es/asuntos-academicos/calendario-y-horarios>

The dates of the global evaluation test (official calls) will be published at <http://eupla.unizar.es/asuntos-academicos/examenes>

4.5.Bibliography and recommended resources

http://biblos.unizar.es/br/br_citas.php?codigo=28821&year=2019