

Academic Year/course: 2021/22

29825 - Manufacturing Technology

Syllabus Information

Academic Year: 2021/22

Subject: 29825 - Manufacturing Technology

Faculty / School: 110 - Escuela de Ingeniería y Arquitectura
326 - Escuela Universitaria Politécnica de Teruel

Degree: 440 - Bachelor's Degree in Electronic and Automatic Engineering
444 - Bachelor's Degree in Electronic and Automatic Engineering

ECTS: 6.0

Year: 3

Semester: Second semester

Subject Type: Compulsory

Module:

1. General information

2. Learning goals

3. Assessment (1st and 2nd call)

4. Methodology, learning tasks, syllabus and resources

4.1. Methodological overview

The student will have the opportunity to attend three different kinds of teaching activities which will require him a growing level of participation: lectures, problem sessions and laboratory sessions.

Theoretical concepts, problems and case studies will be explained to students in a large group format. Though laboratory sessions will be arranged in smaller groups to work with different software programs and laboratory equipment.

This teaching process should be complemented with the students' individual work encompassing activities such as readings or study theoretical and practical topics.

4.2. Learning tasks

The course includes the following learning tasks:

In-class work: 2.4 ECTS (60 hours)

1) Lectures (28 hours)

Oral presentations of theoretical concepts. The basis of the manufacturing technologies together with real examples will be shown. The topics to be covered can be seen in the 'teaching program part'.

2) Problems and technical cases sessions (14 hours)

Problems and cases, related to the theoretical contents, will be developed and explained together with the student's participation though they will be encouraged to work previously on them.

3) Laboratory sessions (18 hours)

Six laboratory sessions that last three hours have been planned. Students will have access to the needed documentation in advance.

Autonomous work: 3.6 ECTS (90hours)

4) Individual work (85 hours).

The student should study all the theoretical topics and practice in the solution of problems. The student will be encouraged to work in a continuous manner by means of a uniform workload throughout the semester. Here are also included tutorial meetings for students requiring individual attention to help them in their learning process.

5) Examination tasks (5 hours)

They have a twofold goal: to grade the student's academic progress and to inform him about the learning level he have reached in the course.

4.3. Syllabus

The course will address the following topics:

Contents block 1: Introduction.

- Definitions.
- Classification of manufacturing processes (DIN 8580).

Contents block 2: Processes and manufacturing technologies.

2.1. Primary shaping processes.

- Casting with non-permanent molds, die casting, injection molding.
- Powder metallurgy.
- Additive manufacturing.

2.2. Material removal processes.

- Metal cutting theory.
- Conventional machining: turning, milling, drilling.
- Abrasive processes.
- Non-conventional machining processes: EDM, wire-EDM?

2.3. Forming processes.

- Volumetric forming processes: Rolling, forging, extrusion.
- Laminar forming processes: Cut, deep drawing, bending.

2.4. Welding and joining processes.

- Welding metallurgy.
- Welding processes.
- Other union processes.

Contents block 3: Manufacturing systems.

- Characterization and analysis.
- CNC programming.
- Tooling and fixturing.
- Maintenance.

Contents block 4: Metrology and Quality.

4.1 Metrology.

- Inspection and industrial metrology.
- Measurement assessment.
- Systems and methods of measurement.
- Fits and tolerances.

4.2 Quality.

- Basic concepts of quality.
- Quality planning.
- Quality in product design and process.
- Quality in manufacturing.

4.4. Course planning and calendar

Lectures, problems, laboratory sessions and official exam schedule will be defined by the EINA (schedules are available in EINA web page). There will be in a general way:

- Three hours in class per week.

- One laboratory session every two weeks.

Mid-semester exams will be done in April, though students will be notified in advance.

All the information concerning optional works will be published in the ADD.