

Academic Year/course: 2021/22

## 30015 - Manufacturing Processes and Industrial Drawing

### Syllabus Information

**Academic Year:** 2021/22

**Subject:** 30015 - Procesos de fabricación y dibujo industrial

**Faculty / School:** 110 - Escuela de Ingeniería y Arquitectura

**Degree:** 436 - Bachelor's Degree in Industrial Engineering Technology

**ECTS:** 6.0

**Year:** 2

**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

In sessions of classroom -whole group- the more theoretical aspects are addressed in the form of master class and completed with technical case study. The practical sessions take place in smaller groups to work with specialized applications and equipment manufacturing workshop. In addition, it develops a tutored work/project.

Students are expected to attending classes proactively within the classroom throughout the semester.

Classroom materials (not necessary books of recommended bibliography) will be available electronic via. These include a repository of the lecture notes used in classroom (not necessary books of recommended bibliography).

Further information regarding the course will be provided on the first day of class.

#### 4.2. Learning tasks

The course includes 6 ECTS organized according to:

- Lectures (1,6 ECTS): 42 (21 hours for Industrial Drawing plus 21 h for Manufacturing Process).
- Laboratory sessions (0.8 ECTS): 9 hours (for Manufacturing Processes) + 9 hours for Industrial Drawing
- Guided assignments (1,6 ECTS): 40 hours.
- Autonomous work (1,6 ECTS): 40 hours.
- Tutorials (0,4 ECTS): 10 hours.

Notes:

*Lectures:* the professor will explain the theoretical contents of the course and solve some illustrative applied examples and problems. The problems can be found in the bibliography recommended at the beginning of the semester. Lectures run for 3 weekly hours. Regular attendance is highly recommended.

*Laboratory sessions:*

Drawing Block: sessions will take place approximately every 2 weeks (3 sessions in total) and last 3 hours each, where each student works using a CAD software.

**Manufacturing Block:** Students will work together in groups actively doing tasks such as practical demonstrations and then they have to elaborate reports to the teacher about the activities of laboratory. Students have to get their Personal Protective Equipment (PPE) themselves to attend mandatory manufacturing lab sessions.

*Guided assignments:* students will complete assignment. If assignments are submitted later, students will not be able to take the final exam of drawing block.

*Autonomous work:* students are expected to spend about 75 hours to study theory, problems, about lab sessions, and take exams.

*Tutorials:* the professor's office hours will be posted on general Website (<https://eina.unizar.es/tutorias-eina/>) to assist students with questions and doubts. It is beneficial for the student to come with clear and specific questions.

### 4.3. Syllabus

The course will address the following topics:

Theory sessions

Drawing Blocks:

- Standardization applied to Technical Drawing
- Assembly drawings, parts list and part drawings and materials used to manufacture
- Representation of Standard roughness values. Graphical symbols of surface texture
- Indication of dimensional, geometrical and general tolerances
- Representation and designation of joint and safety elements, bearings and their accessories, gears, actuating elements, hydraulic systems, threads/threaded joints, screws and nuts.

Manufacturing Blocks:

- Introduction, concept and classification of manufacturing processes
- Molding and casting processes
- Metal forming processes
- Welding and thermal cutting processes.

Laboratory session

- Drawing Block: Conducted training session. 3D design of a workpiece. 3D development of a specific academic/project work.
- Manufacturing Block (3 sessions): Deform process. Welding and thermic cutting process. Mold process.

### 4.4. Course planning and calendar

For further details concerning the timetable, classroom and more information regarding this course, please refer to Escuela de Ingeniería y Arquitectura de la Universidad de Zaragoza (EINA), website, <https://eina.unizar.es/>.

### 4.5. Bibliography and recommended resources

Link:

[http://biblos.unizar.es/br/br\\_citas.php?codigo=30015&year=2019](http://biblos.unizar.es/br/br_citas.php?codigo=30015&year=2019)