Universidad Zaragoza

Academic Year/course: 2021/22

30003 - Graphic expression and computer-assisted design

Syllabus Information

Academic Year: 2021/22
Subject: 30003 - Expresión gráfica y diseño asistido por ordenador
Faculty / School: 110 - Escuela de Ingeniería y Arquitectura
Degree: 436 - Bachelor's Degree in Industrial Engineering Technology
ECTS: 6.0
Year: 1
Semester: 436-First semester o Second semester
107-Second semester
Subject Type: Basic Education
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 learning process that is designed for this subject is based on:

The teaching process will be developed in four main levels:

a) theory classes,

b) exercise classes,

c) laboratory classes and

d) supervised practices; with increasing level of student participation.

In the theory classes, the constents Standardization Industrial Drawing and Descriptive Geometry will be taugth, illustrated with numerous examples each topic. In the exercise classes, the students will solve exercises under the supervision of a teacher.

The laboratory practices will be developed in small groups, where the student will handle the software of Computer Aided Design.

The supervised practices will consist of individual or group homework of technical applications that the student will develop with the guidance and supervision of the teacher.

4.2. Learning tasks

The course includes 06 ECTS organized according to:

- Lectures (1,2 ECTS): 30 hours.

- Classes of problems (0,6 ECTS): 15 hours.

- Laboratory sessions (0,6 ECTS): 15 hours.

- Guided assignments (0,8 ECTS): 20 hours.

- Autonomous work (2,8 ECTS): 70 hours.

Notes:

Lectures and classes of problems: the professor will explain the theoretical contents of the course and solve illustrative applied problems. These problems and exercises can be found in the problem set provided at the beginning of the semester. Lectures run for 3 weekly hours. Although it is not a mandatory activity, regular attendance is highly recommended.

Laboratory sessions: sessions every 2 weeks (5 sessions in total) and 3 hours each. Students will work individually performing CAD practices.

Guided Assignments: Students will complete assignments, problems, and exercises related to concepts viewed.

Autonomous work: students are expected to spend about 70 hours to study theory, solve problems, prepare lab sessions and take exams.

4.3. Syllabus

The main contents are summarized in the following points:

STANDARDIZATION AND INDUSTRIAL DRAWING: Introduction to Graphic for Engineers. Standardization and Computer Aided Design. Drawing instruments and drafting machines. Formats, scales, line types and lettering. Orthographic views. Representation of threads and gears. Broken-out and sections. Dimensioning.

CIVIL ENGINEERING APPLICATIONS: The top view of the point, the line and the plane. Intersection of lines and planes. Resolution of roofs of buildings. The graphical representation of the top of the earth: Contours, drawing lines of constant slope, profiles, earthworks, road layout.

DESCRIPTIVE GEOMETRY: Techniques of labering points, lines and planes. Intersections of lines and planes. Parallelism. Orthogonality. Auxiliary views. Rotations. True size of a plane. The true-length diagram. Distances. Angle between lines and planes.

SURFACES: Contour apparent and representation of surfaces. Defining and types of surfaces. Sections and intersection of lines. Intersections of surfaces. Development of surfaces. Applications: Elbows and transition pieces.

COMPUTER AIDED DESIGN: Introduction and general operation of the software. Main screen. Command imput. Function keys. File management. Environment of software. Drawing aids. Coordinate systems. Display commands. Drawing commands. Selecting entities. Reference entities. Editing commands. Working with layers. Text and shading. Dimensioning. Blocks: creation and insertion. Attributes. Attribute listing. Introduction to 3D design.

4.4. Course planning and calendar

The lectures and practical sessions in the laboratory are given according to the schedule established by the Center and is published prior to the start date of the course on the Center's website and on bulletin boards. Each teacher will report on their tutoring hours. The rest of activities will be planned according to the number of students and will be announced well in advance. By way of guidance, the following timetable for the development of the subject is established:
Standardization and Industrial Drawing (4 first weeks).
- Introduction to Graphic Expression.
- Standardization and Computer Aided Design.
- Tools and equipment for drawing.
- Formats, scales, types of lines and writing.
- Dihedral views. Representation of threads and gears.
- Cuts and sections.
- Dimensioning.
Dihedral system (4 weeks).
- Representation of the Point, the Line and the Plane.
- Intersection of lines and planes.
- Parallelism.
- Perpendicularity.
- Change of Projection Plans.
- Single and Double Partial Views.
- Money.
- Dropping the elements of a plane.
- Measurement of distances.
- Measurement of angles.
Surfaces (4 weeks).
- Apparent contour and surface representation.
- Definition and generation of surfaces.
- Flat sections and intersection with straight lines.
- Intersection of surfaces.
- Development of surfaces.
- Applications: Elbows and Adapters.
Dimensioned Plan System (3 weeks).
- Representation of the Point, the Line and the Plane.
- Situation of lines in a plane.
- Find the given slope plane passing through a line.

- Intersection of lines and planes.
- Resolution of building roofs.
- Representation of land: Curves of level, tracing of lines of constant slope, profiles, explanations, road mapping.

For further details concerning the timetable, classroom and further information regarding this course, please refer to the 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=30003&year=2019