Course guide
240028 - 240028 - Engineering Drawing I

Unit in charge: Barcelona School of Industrial Engineering
Teaching unit: 717 - DEGD - Department of Engineering Graphics and Design.

Degree: Academic year: 2023 ECTS Credits: 6.0
Languages: Catalan, Spanish

LECTURER

Coordinating lecturer: Villa Sicilia, Maria Arantzazu
Others: Fernandez Sanchez, Joaquin
Alsina Torrent, Jose Maria
Lopez Perez, Bruno
Semeraro, Nunzia Alessandra
Juan Colas, Maria Salud Montserrat
Monguet Fierro, Jose Maria
Mataró Villacampa, Joan
Robert Rincón, Miguel

TEACHING METHODOLOGY

Learning based on practical realization. The exposition of theoretical concepts and procedures is combined with the resolution of exercises and the realization of a work.

The face-to-face sessions are held in computer rooms at the rate of one computer per student, with the support provided by industrial design CAD software. There are two types of sessions:
- Individual resolution of exercises with the help of the teacher, where the theoretical concepts and procedures taught are applied.
- Realization and follow-up of a work done in a group of 2 or 3 people.

The student has the possibility to legally and free of charge install the CAD program. This allows one to complete the work done in class, assimilate the theoretical concepts, carry out group work and solve the proposed exercises.

LEARNING OBJECTIVES OF THE SUBJECT

The main objective of the course is:
Strengthen and develop the capacity for three-dimensional spatial conception. Introduce the concepts and methodologies of the area of Graphic Engineering.

Specific objectives:
- Acquire a basic knowledge of industrial graphic language, both at the reading and execution level (graphic language conventions) and the presentation of graphic documentation.
- Expand knowledge of spatial metric geometry.
- Identify the form-function relationship of a certain object or mechanism and apply it to its design and/or modification.

STUDY LOAD

<table>
<thead>
<tr>
<th>Type</th>
<th>Hours</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Practical classes</td>
<td>60,0</td>
<td>40.00</td>
</tr>
<tr>
<td>Self study</td>
<td>90,0</td>
<td>60.00</td>
</tr>
</tbody>
</table>

Total learning time: 150 h
## CONTENTS

### Standardization of industrial drawing

**Description:**

**Full-or-part-time:** 8h  
Practical classes: 4h  
Self study : 4h

### 3D Modelling from reading normalised dihedral representations of a part and assembly modeling.

**Description:**
Exercises which intend to introduce students in using 3D CAD software (Procedures. Tools. Concepts. Strategies) while they learn how to read normalised dihedral representations and interpreting them.

**Full-or-part-time:** 28h  
Practical classes: 12h  
Self study : 16h

### Normalized graphic representation of parts and assemblies from 3D models.

**Description:**
The student has to decide, according to his own criteria, which are the views, sections, axes, dimensioning, etc. necessary and sufficient to represent a part or assembly. The 2D drawing tools are taught with the program and the concepts learned in topic 1 are applied.

**Full-or-part-time:** 24h  
Practical classes: 8h  
Self study : 16h

### Introduction to industrial design

**Description:**
Industrial design methodology. Form-function. Introduction to standardized mechanical components and their representation. It delves into positional relationships (Mates). Collision detection. Motion study is introduced.

**Full-or-part-time:** 32h  
Practical classes: 12h  
Self study : 20h

### Space geometry and elemental metric

**Description:**
Elements of space geometry: point, straight line and planes. Relative positions among elements: belonging, intersection, parallelism and perpendicularity. Distances, angles and slopes. Particular positions with respect to projection planes.

**Full-or-part-time:** 20h  
Practical classes: 8h  
Self study : 12h
Applying elemental metric to creation and measurement of polyhedron bodies in 3D.

Description:
3D construction of a polyhedron from its metrical properties (angles, distances and slopes). Application of 3D CAD software’s measurement systems and of space geometry concepts to analyse a polyhedron's metrical properties.

Full-or-part-time: 14h
Practical classes: 6h
Self study: 8h

Aplication of elemental metrics and surface theory to creation and measurement of bodies of revolution.

Description:
3D modelling of surfaces sets defined by their properties, metrical values, relative positions, intersections or unrolled. The application is limited to the study of sphere, toroid, revolution cylinder and revolution cone; with all the possible interactions.

Full-or-part-time: 24h
Practical classes: 10h
Guided activities: 14h

GRADING SYSTEM

The evaluation is divided into three qualifications:
- Partial Assessment (AP)
- Work (T)
- Final Exam (EF)

The Final Note (NF) will be:
NF = 0.2 * AP + 0.3 * T + 0.5 * EF
Of the 30% of the Work grade, 15% corresponds to the same group grade and the other 15% is individual.

There is a Reevaluation exam (ER). The mark of this reassessment exam has a weight of 70% in the Final Mark. The remaining 30% corresponds to the mark of the Work (T) carried out during the course.
BIBLIOGRAPHY

Basic:

RESOURCES

Hyperlink: