Course guide
240731 - 240731 - Industrial Design

Unit in charge: Barcelona School of Industrial Engineering
Teaching unit: 717 - DEGD - Department of Engineering Graphics and Design.
Degree: BACHELOR'S DEGREE IN INDUSTRIAL TECHNOLOGIES AND ECONOMIC ANALYSIS (Syllabus 2018).
(Compulsory subject).
Academic year: 2022  ECTS Credits: 6.0  Languages: English

LECTURER
Coordinating lecturer: Fernandez Sanchez, Joaquin
Others: Ramos Cabal, Alba
          Alsina Torrent, Jose Maria

PRIOR SKILLS
Those planned for the Degree

REQUIREMENTS
none

DEGREE COMPETENCES TO WHICH THE SUBJECT CONTRIBUTES

Transversal:
04 COE. EFFICIENT ORAL AND WRITTEN COMMUNICATION. Communicating verbally and in writing about learning outcomes, thought-building and decision-making. Taking part in debates about issues related to the own field of specialization.
05 TEQ. TEAMWORK. Being able to work as a team player, either as a member or as a leader. Contributing to projects pragmatically and responsibly, by reaching commitments in accordance to the resources that are available.
06 URI. EFFECTIVE USE OF INFORMATION RESOURCES. Managing the acquisition, structure, analysis and display of information from the own field of specialization. Taking a critical stance with regard to the results obtained.
07 AAT. SELF-DIRECTED LEARNING. Detecting gaps in one's knowledge and overcoming them through critical self-appraisal. Choosing the best path for broadening one's knowledge.
03 TLG. THIRD LANGUAGE. Learning a third language, preferably English, to a degree of oral and written fluency that fits in with the future needs of the graduates of each course.

TEACHING METHODOLOGY
This subject is based on the Project Based Learning (PBL) methodology. From the first session to the last, the student must focus and develop graphic metric solutions for the design of real problems and practices.
The student must identify a real metric problem in his/her daily environment and must resolve it together with other students (collaborative or a cooperative team) looking for a real solution for a real need.
All the contents of the subject are intended to give the necessary background to resolve these real problems and practices.
The contents are structured as follows:
1. Files with the basic metric constructions. Each of them has a graphic description, a CAD solution file, and one or more videos.
2. Files with common metric constructions of Polyhedrons and Solids of Revolution.
4. References
   a. Polyhedron and Revolution Solids
   b. Solidworks handbooks
LEARNING OBJECTIVES OF THE SUBJECT

The main goal of the subject is:

Introduce the knowledge, techniques and behaviors who are present in a Graphic Process of an Industrial Design.

Particular objectives are:

1. Learn how to apply the metric conditions with a CAD Software.
2. Learn the essential constructive conditions of objects and groups of objects.
3. Learn how to identify and define a metric problem in a real environment.
4. Learn how to define a design under international regulations.
5. Learn how to develop a real industrial design in a collaborative or a cooperative team.

STUDY LOAD

<table>
<thead>
<tr>
<th>Type</th>
<th>Hours</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hours medium group</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

Basic Metric Geometry Constructions

Description:
In this chapter, the student works with the metric relationships between the point, the line and the plane.

Specific objectives:
1. Learn how to apply metric conditions with a CAD Software.
2. Learn the essential constructive conditions of objects and groups of objects

Related activities:
The self-study of the metric basic constructions explained in the Metric Basic Constructions handbook. This handbook offers a list of guidelines and video resources that facilitate a non-present learning of the necessary technics and knowledge procedures to resolve the most commons metric constructions of the Industrial Design.

Related competencies:
06 URI. EFFECTIVE USE OF INFORMATION RESOURCES. Managing the acquisition, structure, analysis and display of information from the own field of specialization. Taking a critical stance with regard to the results obtained.
07 AAT. SELF-DIRECTED LEARNING. Detecting gaps in one’s knowledge and overcoming them through critical self-appraisal. Choosing the best path for broadening one’s knowledge.
03 TLG. THIRD LANGUAGE. Learning a third language, preferably English, to a degree of oral and written fluency that fits in with the future needs of the graduates of each course.

Full-or-part-time: 32h
Theory classes: 4h
Practical classes: 8h
Self study: 20h
Metric Relations and Graphic Constructions of Polyhedrons and Solids of Revolution

Description:
In this chapter, the student works applying the metric constructions to build simplified objects with Polyhedrons and Solids of Revolution.

Specific objectives:
1. Learn the essential constructive conditions of objects and groups of objects.
2. Learn how to identify and define a metric problem in a real environment.

Related activities:
This chapter is related to the self-study of:
1. The metric characteristics of the Polyhedrons and the Basic Solids of Revolution available in some selected papers and books.
2. The metric constructions for the tangency relationships between Solids of Revolution explained in the Solids of Revolution handbook.

Related competencies:
06 URI. EFFECTIVE USE OF INFORMATION RESOURCES. Managing the acquisition, structure, analysis and display of information from the own field of specialization. Taking a critical stance with regard to the results obtained.
05 TEQ. TEAMWORK. Being able to work as a team player, either as a member or as a leader. Contributing to projects pragmatically and responsibly, by reaching commitments in accordance to the resources that are available.
03 TLG. THIRD LANGUAGE. Learning a third language, preferably English, to a degree of oral and written fluency that fits in with the future needs of the graduates of each course.

Full-or-part-time: 40h
Theory classes: 4h
Practical classes: 16h
Self study: 20h

Defining Industrial Designs with Graphical Tools

Description:
Defining Industrial Designs with Graphical Tools

Specific objectives:
1. Learn how to define a design following international regulations.
2. Learn how to develop a real graphic design in a cooperative team.

Related activities:
1. Resolve some practices based on a real Industrial Design using a CAD software.
2. Define the graphic documents under the International Regulations for an Industrial Technics Documents, such as UNE, ISO, DIN...
3. Resolve a real proposal of an Industrial Design by teams of four or more members.

Related competencies:
06 URI. EFFECTIVE USE OF INFORMATION RESOURCES. Managing the acquisition, structure, analysis and display of information from the own field of specialization. Taking a critical stance with regard to the results obtained.
05 TEQ. TEAMWORK. Being able to work as a team player, either as a member or as a leader. Contributing to projects pragmatically and responsibly, by reaching commitments in accordance to the resources that are available.
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03 TLG. THIRD LANGUAGE. Learning a third language, preferably English, to a degree of oral and written fluency that fits in with the future needs of the graduates of each course.

Full-or-part-time: 78h
Theory classes: 8h
Practical classes: 20h
Self study: 50h
GRADING SYSTEM

1. Basic Metric Construction qualification (MC)
2. Metric of Polyhedrons and Solids of Revolution qualification (MPS)
3. Problem qualification (PR)
4. Problem Proposition (PP)
5. Design Practice (DP)

Continuous evaluation: MC*0.1+MPS*0.2+PR*0.2+PP*0.2+DP*0.3

Final evaluation: DP and PP will not be evaluated in the final exam. In the other cases, the student could select which components of the continuous evaluation wants to recover.

EXAMINATION RULES.

The exams of the partial and final evaluations (MC, MPS and PR) must be carried out without the support of a calculator. For the rest of activities (PP and DP) students can have any kind of documentation.

BIBLIOGRAPHY

Basic:

RESOURCES

Other resources:
- Solidworks Tutorials, Solidworks Learning Resources, Dassault Systems, 2019
UNE