

30167 - Computer Assisted Design

Información del Plan Docente

Academic Year	2016/17
Academic center	175 - Escuela Universitaria Politécnica de La Almunia
Degree	425 - Bachelor's Degree in Industrial Organisational Engineering
ECTS	6.0
Course	4
Period	Second semester
Subject Type	Optional
Module	---

1. Basic info

1.1. Recommendations to take this course

1.2. Activities and key dates for the course

2. Initiation

2.1. Learning outcomes that define the subject

2.2. Introduction

3. Context and competences

3.1. Goals

3.2. Context and meaning of the subject in the degree

3.3. Competences

3.4. Importance of learning outcomes

4. Evaluation

5. Activities and resources

5.1. General methodological presentation

The learning process that is designed for this subject is based on the following:

A strong interaction teacher / student. This interaction becomes a reality by a division of labor and responsibilities between students and teachers. However, to some extent, the students will be allowed to set up their own pace of learning according to their needs and availability, following the guidelines set by the teacher.

The teaching organization is based on the number of ECTS credits, which represents, in this case 150 hours of student

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work on the subject during the semester (15 weeks tuition). 48% of this work (70h) will be held in the classroom and the O.T. LAB and the rest will be autonomous.

The organization of the actual teaching will be based on the following guidelines:

* **Theory/Practice Lectures** : The concepts and procedures of the subject will be explained and developed simultaneously, giving practical examples as support (in class and group tutorials), requiring a high participation of the students and activities driven by the teacher / a.

- The number of students enrolled will be divided into groups not bigger than 20 people, so that smaller groups can be created. Computer software practical activities will be done for the making of digital prototypes using different computer tools and getting as much information as required for its manufacturing and assembly.

* **Group tutorials** : Scheduled tracking learning activities in which the teacher meets with a group of students to guide their autonomous learning work and consultancy of targeted work or tasks that require a very high degree of advice from the teacher. Essentially a number of hours will be required for such group monitoring (to agree with each of the groups, with at least the specified time in the **Calendar** section of this document).

* **Individual tutorials** : These are made on a one-to-one basis, at the department. They aim to help solving problems that are the students might have, particularly those which for several reasons cannot attend group tutorials or need a more personalized attention. These tutorials may be face-to-face or virtual (Moodle or email).

5.2.Learning activities

The program that the students are offered to help them achieve the expected results involves the following activities...

Active participation of the students, so that, to achieve the learning outcomes, no redundancy intended with the above mentioned, the following activities will be developed:

- **Face-to-face Generic Activities:**

* **Theoretical-practical classes:** the concepts and procedures of the subject will be developed and practical examples as support will be developed.

* **Lab practice work** : Students will be divided into several groups not bigger than 24 students / being monitored by the teacher.

- **Non-class Generic Activities:**

* Study and assimilation of the concepts and procedures outlined in the laboratory.

* Understanding and assimilation of the problems and practical cases solved in practical lessons.

* Organization of seminars, suggested problems solving, etc.

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* Organization of laboratory practice work, development of scripts and reports.

* Individual and group production of the final project.

- **Monitored autonomous activities:** Although they will rather have a mixed nature between face-to-face and non-class tuition they have been considered separately and will be focused mainly to seminars and tutorials under the supervision of the teacher.

- **Reinforcement activities :** With a remarkable non-class nature, through a virtual learning portal (Moodle, e-mail) several activities that reinforce the basic contents of the subject will be carried out. These activities can be customized or not, and will be monitored through the portal.

The subject consists of 6 ECTS credits, which represents 150 hours of the student work during the semester, i.e. 10 hours per week for 15 tuition weeks.

5.3.Program

Essential Contents of the subject for the achievement of learning outcomes

Theoretical and practical part to be developed in the O.T. Laboratory, and throughout the 2nd semester (4 hours per week).

INTRODUCTION AND BASIC ARCHITECTURE	
UNIT 0	<p>PROGRAM AND PRESENTATION OF THE COURSE</p> <p>0.1 Introduction to the Subject and general presentation of the theoretical and practical contents</p> <p>0.2 Scheduling of classroom lessons, blended learning and autonomous classes</p> <p>0.3 Group and individual tutorials timetable</p> <p>0.4 Assessment Criteria and Ratings. CEVA table</p> <p>0.5 Introduction and purpose of the Software and Hardware to use</p> <p>0.6 Delivery of cards for the call for</p>

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	papers. Work groups Distribution
UNIT 1	<p>FACTORY DESIGN TOOLS</p> <p>1.1 Base Products</p> <p>1.2 Basic Architecture</p> <p>1.3 Inventor Applications for the Factory</p> <p>1.4 Navisworks</p>
UNIT 2	<p>ARCHITECTURE PRINCIPLES</p> <p>2.1 Principles and Concepts</p> <p>2.2 General Overview of the Option Ribbon</p> <p>2.3 Application Menu</p> <p>2.4 Tools and Tool Palette</p> <p>2.5 Content Browser</p>
UNIT 3	<p>CREATING THE "CONTINENT"</p> <p>3.1 Conversion of the Working Lines in Exterior walls</p> <p>3.2 Working Plant Grid</p> <p>3.3 Curtain Wall</p> <p>3.4 Entry</p>

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	3.5 Floor Surface
UNIT 4	<p>INTERIOR FEATURES</p> <p>4.1 Common Walls</p> <p>4.2 Doors and Windows</p> <p>4.3 Bathrooms</p> <p>4.4 Revolution Furniture and Displacement</p>
MODELING COMPONENTS AND ASSEMBLIES	
UNIT 5	<p>INTRODUCTION TO MODELING. BASIC DRAWING TECHNIQUES</p> <p>5.1 User Interface. Recognition</p> <p>5.2. Handling. Handling Model Viewpoints</p> <p>5.3 Component Parametric Design</p> <p>5.4 Sketches</p> <p>5.5 Geometrical Constraints</p> <p>5.6 Dimensioning of Sketches</p>
	<p>SHAPE DESIGN. CHARACTERISTICS</p> <p>6.1 Basic Features</p> <p>6.2 Extrude and Revolve Features</p>

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<p>UNIT 6</p>	<p>6.3 Setting Features Considered</p> <p>6.4 Model Sketches</p> <p>6.5 Parametric Editor</p> <p>6.6 Using Parameters. Editing Components</p> <p>6.7 Parameters and Multivalue</p> <p>6.8 Working Features</p> <p>6.9 Chamfers and Fillets</p> <p>6.10 Holes and Threads</p> <p>6.11 Modeling and Features. Creating templates</p>
<p>FACTORY DESIGN. LAYOUT AND ASSET</p>	
<p>UNIT 7</p>	<p>FACTORY DESIGN UTILITIES. ASSET TRACES AND LOCATION</p> <p>7.1 Factory User Interface. Factory Plotting</p> <p>7.2 Factory Asset</p> <p>7.3 Model Insertion</p> <p>7.4. Component replacement</p> <p>7.5 Asset Properties Changing</p>
	<p>FACTORY ASSET PUBLICATION</p>

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<p>UNIT 8</p>	<p>8.1 Asset Creating</p> <p>8.2 Surface Joint Point and Connector</p> <p>8.3 Key Parameters</p> <p>8.4 Asset Publication</p>
<p>UNIT 9</p>	<p>WORKFLOW</p> <p>9.1 Project Files for Factory Design</p> <p>9.2 Factory Templates</p> <p>9.3 Construction of the Main Plant</p>
<p>DOCUMENTATION-NAVIGATION AND SIMULATION</p>	
<p>UNIT 10</p>	<p>FACTORY DESIGN UTILITIES. ASSET TRACES AND LOCATION</p> <p>10.1 Factory Documentation Generation</p> <p>10.2 Base and Projected Viewpoints</p> <p>10.3 Section Viewpoints and Details</p> <p>10.4 Creating and Editing sectional views and details</p> <p>10.5 Dimensions, notations and Lists. 2D interoperability</p>
<p>UNIT 11</p>	<p>NAVISWORK</p> <p>11.1 User Interface</p>

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	11.2 Workflow. Data Input 11.3 NWD File. Publishing NWD File
UNIT 12	DISPLAYING. THE DIGITAL PROTOTYPE 12.1 Navigation. Using Tools 12.2 Viewpoints 12.3 Animations. 12.4 The Registration and Animation 12.5 The Digital Prototype 12.6 Tools: Factory Layout, Numbering, sectioning 12.7 Optimization. Simulation
UNIT 13	COLLISIONS AND COLLABORATION 13.1 Collision Detection 13.2 Geometry Collision Detection Generation 13.3 Tools

5.4.Planning and scheduling

Classroom session schedule and presentation of works

For the presentation of papers the students will be informed either during the development of the classroom activities or through the Moodle platform: <http://moodle.unizar.es>.

In the following table, the schedule which includes the development of the activities and work is shown and may vary depending on the teaching progress:

5.5. Bibliography and recommended resources

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- Piedrafita Moreno, Ramón. Ingeniería de la automatización industrial / Ramón Piedrafita Moreno . - 2a ed. amp. y act. Madrid : Ra-Ma, D.L. 2003 [cop. 2004]
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