Universitat de Lleida

DEGREE CURRICULUM

GRAPHIC EXPRESSION II

Coordination: COMELLAS ANDRES, MARTI

Academic year 2023-24

GRAPHIC EXPRESSION II 2023-24

Subject's general information

<table>
<tr><td>Subject name</td><td>GRAPHIC EXPRESSION II</td></tr>
<tr><td>Code</td><td>102310</td></tr>
<tr><td>Semester</td><td>2nd Q(SEMESTER) CONTINUED EVALUATION</td></tr>
<tr><td>Typology</td><td>
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<tr><th>Degree</th><th>Course</th><th>Character</th><th>Modality</th></tr>
<tr><td>Bachelor's Degree in Mechanical Engineering</td><td>3</td><td>COMPULSORY</td><td>Attendance-based</td></tr>
<tr><td>Double bachelor's degree: Degree in Mechanical Engineering and Degree in Energy and Sustainability Engineering</td><td>3</td><td>COMPULSORY</td><td>Attendance-based</td></tr>
<tr><td>Master's Degree in Industrial Engineering</td><td>1</td><td>COMPLEMENTARY TRAINING</td><td>Attendance-based</td></tr>
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<tr><td>Course number of credits (ECTS)</td><td>6</td></tr>
<tr><td>Type of activity, credits, and groups</td><td>
<table>
<tr><th>Activity type</th><th>PRALAB</th><th>TEORIA</th></tr>
<tr><td>Number of credits</td><td>3</td><td>3</td></tr>
<tr><td>Number of groups</td><td>2</td><td>2</td></tr>
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<tr><td>Coordination</td><td>COMELLAS ANDRES, MARTI</td></tr>
<tr><td>Department</td><td>INDUSTRIAL AND BUILDING ENGINEERING</td></tr>
<tr><td>Teaching load distribution between lectures and independent student work</td><td>40% attendance
60% autonomus</td></tr>
<tr><td>Important information on data processing</td><td>Consult this link for more information.</td></tr>
<tr><td>Language</td><td>Catalan (part of the material in English)</td></tr>
<tr><td>Distribution of credits</td><td>3 Theory
3 Practice</td></tr>
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GRAPHIC EXPRESSION II 2023-24

Teaching staff	E-mail addresses	Credits taught by teacher	Office and hour of attention
COMELLAS ANDRES, MARTI	marti.comellas@udl.cat	6	Wednesday 17-19h CREA building, office 0.19
SOLE CUTRONA, CRISTIAN	cristian.sole@udl.cat	6	

Subject's extra information

The main knowledge necessary for the proper following of the subject are those which are treated on the subject Graphic Expression I.

Software used: **CREO Parametric** 3D CAD.

Learning objectives

- Express and interpret the geometry of a part from sketches and freehand annotations.
- Express and interpret the assembly/operation of a group/mechanism from sketches and freehand annotations.
- Understand how to use parametric modeling/design techniques of parts and assemblies.
- Know the main features that CAD softwares have in common when modeling parts and assemblies.
- Have the ability to create appropriate drawings in order to report any design created with 3D CAD.
- Apply the previous knowledge using a parametric 3D CAD software available in the market: the CREO Parametric.

Competences

Strategic Competences of the UdL

- **UdL3** Mastering ICT's.

Specific competences

- **GEM5**. Capacity of spatial vision and knowledge of the techniques of graphic representation, either by traditional methods of metric geometry and descriptive geometry or by applications of computer-aided design.
- **GEM19**. Knowledge and capacity to apply graphic engineering techniques.

Subject contents

1. INTRODUCTION TO CAD SYSTEMS

    1.1 Definition and classification of CAD systems

    1.2 Design process using 3D CAD modelling tools

    1.3 Modelling process with a parametric system

    1.4 CAD files in native and neutral formats

    1.5 Additional modules of a CAD system and integrated softwares

2. 3D PARAMETRIC MODELING OF PARTS

    2.1 Sequence of parts parametric modelling process

    2.2 Editing geometry, features and models

    2.3 Datum Features

    2.4 Parametric sketch of 2D geometry

    2.5 Feature types for the geometry part definition

    2.6 Editing features: group, copy, symmetry

    2.7 Patterns

    2.8 Checking, measuring and analysing of parts

    2.9 Parent-child relationships

    2.10 Parameters and Relations

    2.11 Parts families

3. ASSEMBLIES CREATION IN PARAMETRIC CAD

    3.1 Groups assembly

    3.2 Sections

    3.3 Explodes

    3.4 Parameters and Relations

3.5 Assemblies families

4. DRAWINGS GENERATION

4.1 Introduction

4.2 Creation process of a new CAD parametric drawing

4.3 Addition of views to the drawing

4.4 Views properties

4.5 Exploded views

4.6 Views annotations

4.7 Other annotations in drawings

Methodology

- **Lectures**: They will take place during the Full Group sessions. Statement of theoretical contents followed by practical examples.
- **Practices**: They will take place during the Half Group sessions. CREO software usage in order to apply theoretical concepts doing practical exercises.
- **Group work**: Team development of a parametric CAD modelling project.

Development plan

Week	Methodology	Unit	Attendance hours	Autonomous work hours
1	Lectures Practices	Subject introduction CREO interface introduction	1 2	0
2	Lectures Practices	Unit 1: Theory Unit 1: Practices	2 2	2
3	Lectures Practices	Unit 2: Theory Unit 2: Practices	2 2	4
4	Lectures Practices	Unit 2: Theory Unit 2: Practices	2 2	6
5	Lectures Practices	Unit 2: Theory Unit 2: Practices	2 2	6
6	Lectures Practices	Unit 2: Theory Unit 2: Practices	2 2	6
7	Lectures Practices	Unit 3: Theory Unit 3: Practices	2 2	6
8	Group work	Group work development	1,5	6
9	Evaluation	Test 1 - Theory Test 1 - Practice	3	6
10	Lectures Practices	Unit 3: Theory Unit 3: Practices	2 2	6

11	Lectures Practices	Unit 3: Theory Unit 3: Practices	2 2	6
12	Lectures Practices	Unit 4: Theory Unit 4: Practices	2 2	6
13	Lectures Practices	Unit 4: Theory Unit 4: Practices	2 2	6
14	Lectures Practices	Unit 4: Theory Unit 4: Practices	2 2	6
15	Group work	Group work development	1,5	6
16-17	Evaluation	Test 2 - Theory Test 2 - Practice	3	6
18	Tutoring	Tutoring	1	3
19	Evaluation	Recovery Test	3	3

Evaluation

Several evaluation activities will be done:

BLOCK 1: Parts

- Test 1 - Practice: Individual, with computer, medium term (week 9). It will be evaluated the content exposed and worked in class up to the date of this exercise.
- Test 1 - Theory: Individual, written, medium term (week 9). It will be evaluated the content exposed and worked in class up to the date of this exercise.

BLOCK 2: Assemblies and Drawings

- Test 2 - Practice: Individual, with computer, at the end of the semester (week 16 or 17). It will mainly be evaluated the content exposed and worked in class between the Test 1 - Practice and Test 2 - Practice .
- Test 2 - Theory: Individual, written, at the end of the semester (week 16 or 17). It will mainly be evaluated the content exposed and worked in class between the Test 1 - Theory and Test 2 - Theory.

BLOCK 3: Project

- Group work: Parts and mechanical assemblies design project to be held in groups along the semester.

- Recovery Test: Individual, two weeks after the last test (week 19). It will have four parts corresponding to each of the four individual tests done along the course. The student will be able to attend all or some of the four parts. The obtained grades substitute the previous ones. If the student attends more than one part, the maximum grade they can obtain for the subject will be 6.

The weight assigned to each evaluation activity, out of 100, is as follows:

Block	Activity	Weight	
1	Test 1 - Practice	24	40
	Test 1 - Theory	16	
2	Test 2 - Practice	27	45
	Test 2 - Theory	18	
3	Group work	15	
1 i 2	Recovery Test	24+16+27+18=85	

Note: The grade obtained on the Group Work is not recoverable. A minimum grade of 3.5 is required in the practice tests.

Alternative evaluation:
• Individual test, will take place on the recovery day. It will consist of four parts corresponding to each of the four individual tests done along the course. It will have a weight of 85% (24+16+27+18).
• Group Work: Parts and mechanical assemblies design project to be held in groups along the semester. It will have a weight of 15%.

Bibliography

Félez, J., Martínez, M.,Cabanellas, J., y Carretero, A. (1996). “Fundamentos de Ingeniería Gràfica”. Síntesis,Madrid.

Pérez, J. y Palacios, S. (1998).“Expresión Gráfica en la Ingeniería. Introducción al Dibujo Industrial”. PrenticeHall, Madrid, primera edición.

Ramos, B. y García, E. (1999). “DibujoTécnico”. AENOR, Madrid.

AENOR (1999). “Dibujo Técnico. Normas básicas”. AENOR,Madrid, quinta edición.

Fisher, U. et al. (2006) “Mechanical and Metal TradesHandbook”. Verlag Europa, Alemanya

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