

30103 - Graphic expression and computer-assisted design

Syllabus Information

Academic year: 2023/24

Subject: 30103 - Graphic expression and computer-assisted design

Faculty / School: 175 - Escuela Universitaria Politécnica de La Almunia
179 - Centro Universitario de la Defensa - Zaragoza

Degree: 425 - Bachelor's Degree in Industrial Organisational Engineering
563 - Bachelor's Degree in Industrial Organisational Engineering

ECTS: 6.0

Year: 1

Semester: First semester

Subject type: Basic Education

Module:

1. General information

The main objectives of the subject are, on the one hand, to develop the student's capacity for spatial vision, and on the other hand, to transmit skills that allow them to express with precision and clarity graphic solutions in the different systems of representation. The knowledge and use of Computer Aided Design (CAD) will provide students with communication tools applicable in all stages of their professional life. These approaches and objectives are aligned with the following Sustainable Development Goals (SDGs) of the United Nations Agenda 2030, so that the acquisition of the learning outcomes of the subject provides training and knowledge, skills and competencies to contribute to some extent to their achievement: SDGS 4 AND 5.

To take this subject the student should have a previous general knowledge of the contents of the subject of Technical Drawing of Bachillerato.

2. Learning results

- They are proficient in solving graphical problems that may arise in engineering.
- Develop skills and abilities that allow to express with precision, clarity, objectivity and universality graphic solutions.
- Acquire the capacity of abstraction to be able to view an object from different positions in space.

3. Syllabus

DEFENSE

Topic 0: Basic concepts of metric geometry

- 0.1. Fundamental graphical plots
- 0.2. Fundamental constructions
- 0.3. Geometric figures and bodies

Topic 1: Basic concepts of standardization

- 1.1. Scales
- 1.2. Formats
- 1.3. Line types
- 1.4. Text labeling

Topic 2: Descriptive geometry: dihedral system, dimensioning and cuts

- 2.1. Fundamentals of the dihedral system
- 2.2- Dihedral views
- 2.3. Annotation
- 2.4. Cuts

Topic 3: Axonometric system

- 3.1. Isometric perspective
- 3.2. Perspective from a gentleman's perspective

Topic 4: System bounded

- 4.1. General topography
- 4.2. Earthworks
- 4.3- Topographic profiles

Computer Aided Design

1. Basic modeling of parts
2. Assembly of parts
3. Obtaining drawings

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1- Technical Drawing and Representation Systems

1-1.- Geometric Drawings. Basic Metric Normalization and Geometric Drawings Sketching Dimensioning Cutting and Sections Thread Representation Taper, Convergence, Inclination and Slope

1-2.- Industrial Technical Drawing. Advanced Standardization of Removable and fixed connecting elements. Surface Marks and Tolerances, Toothed Wheels, Bearings Assemblies and Parts. Materials

2.- Knowledge and Application in CAD-CAE Development

2-1 Knowledge and Application in CAD-CAE Development (I) Introduction to the Modeling Process Working with Sketches Introduction to 3D Operations Assemblies (Assemblies, Groups, U.F.) Exploded Documentation 2-2 Knowledge and Application in CAD-CAE Development (II) Schematic Development Software

4. Academic activities

DEFENSE

- Lectures [20 hours]: face-to-face sessions where the theoretical knowledge of the subject is presented and explained.
 - Problem sessions [20 hours]: face-to-face sessions where the knowledge learned in the lectures is applied graphically.
 - Laboratory sessions [20 hours]: classroom sessions with computer equipment where the use of 3D parametric modeling software is explained and practiced.
 - Autonomous work [82 hours]: part of the course where the students, through their autonomous study, must assimilate the knowledge worked in the classroom sessions.
- Assessment (8 hours).
- Theoretical and practical tests [5 hours]
 - DAO tests [3 hours]

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Theoretical-practical classes (30h): The theoretical concepts of the subject will be explained and practical examples will be developed to support the theory when necessary.

Laboratory practices (30h): The students will be divided into several small groups, where the concepts and procedures corresponding to CAD-CAE tools will be explained and applied..

Tutored practical work -Tutorials-: Tutored practical work, work and exercise follow-up, including attendance and individual attention, during the schedule published on the EUPLA website.

Personal study. Individual dedication necessary to consolidate a correct learning process.

Assessment test: Individual test where the student, in addition to the grading function, will be able to identify their degree of understanding and assimilation of the subject.

5. Assessment system

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FIRST CALL

Continuous assessment

1. Theoretical-practical exam 1: Topics 1, 2 and 3 (PTP1)
2. Theoretical-practical exam 2: Topic 4 (PTP2)
3. DAO Examination (PDAO)

Final grade= 0.7-PTP grade + 0.3-DAD grade

With

PTP score=0.6-PTP1 score + 0.4-PTP2 score

To pass the subject by continuous evaluation it is necessary that $PTP \geq 5$ and $PDAO \geq 5$. If only one of the parts, PTP or PDAO, has a grade greater than or equal to 5, this grade will be saved and only the part corresponding to with a grade lower than 5 will remain pending. The grades of PTP1 and PTP2 separately are not retained for the global test, nor for the call in July.

Overall test

Students who do not pass the subject by continuous evaluation or who want to improve their grade, may sit for the Global Test, with the best of the grades obtained prevailing.

1. Theoretical-practical exam: Topics 1, 2, 3 and 4 (PTP)
2. DAO Examination (PDAO)

Final grade=0.7-PTP score + 0.3-DAO score

In order to obtain the Final Grade in the First Round, it is required that $PTP \geq 5$ and $PDAO \geq 5$, being possible to have obtained any of them either by Continuous Assessment or in the Global Test. The grade, PTP or PDAO, which is greater or equal to than 5 is retained for the Second Round, leaving only one of the parts pending. No grade will be retained for subsequent years.

SECOND CALL

Students who do not pass the subject in the First Call may sit for the Global Test in the Second Call, whose requirements and grade calculation will be the same as in the First Call.

Instruments vs. learning results

Assessment instruments:	Weighting	RA-1	RA-2	RA-3
PTP1 Examination	42%	X	X	X
PTP2 Examination	28%	X	X	X
DAO Examination	30%	X	X	X

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CONTINUOUS ASSESSMENT SYSTEM

Participation (20%): Activities and work proposed in class; Attitude and direct observation of skills and abilities in the subject.

Individual/Group Work -CAD-CAE- (40%): Proposed work.

Assessment test (40%): Test of practical application of concepts and procedures.

All items will have a summative value as long as the value in each one of them is > 4

The students that in the continuous assessment have not passed some of the sections will have to present themselves in the corresponding callings ONLY of that part not passed or, if necessary, make the appropriate corrections.

OVERALL FINAL ASSESSMENT TEST

The student must opt for this modality when, due to their personal situation, they cannot adapt to the pace of work required in the continuous assessment system, has failed or would like to raise their grade after having participated in the continuous assessment system.

Individual work: CAD-CAE- (50%): Schematic, plan and assembly works.

Assessment test (50%): Test of practical application of concepts and procedures.

All items will have a summative value as long as the value in each one of them is > 4