Universidad Zaragoza

Academic Year/course: 2021/22

28837 - Computer Aided Design in Mechatronics

Syllabus Information

Academic Year: 2021/22
Subject: 28837 - Computer Aided Design in Mechatronics
Faculty / School: 175 - Escuela Universitaria Politécnica de La Almunia
Degree: 424 - Bachelor's Degree in Mechatronic Engineering
ECTS: 6.0
Year: 4
Semester: Second semester
Subject Type: Optional
Module:

1. General information

1.1. Aims of the course

The course and its expected results respond to the following approaches and goals:

Ÿ Introduce the future Engineer into the spatial representation of graphic drawing, based on the different Representation Systems.

Ÿ Make the relevance of the course understood as a ?Communication Language? at all levels of industry.

Ÿ Know how to apply, in graphic documents, geometric drawing processes and major standards of Technical Drawing concerning the industrial world

Ÿ Knowledge and application of CAD / CAE programs and their use as a tool for

2D and 3D representation.

Ÿ To be able to explain, through the solving of practical cases published for this purpose, all procedures and theoretical knowledge acquired, reinforcing their independent work, given the relevance of non-classroom credits in the new EHEA (European Higher Education Area) framework.

Ÿ Producing and printing technical documents-blueprints

1.2. Context and importance of this course in the degree

CAD systems are used in product design engineering to obtain a precise geometric model.

These systems allow to validate the solution from the dimensional and assembly point of view.

CAE systems consist in the use of software to evaluate the geometric model obtained as a numer

CAD / CAE systems are essential in any industrial sector in the field of engineering.

1.3. Recommendations to take this course

For the acquisition of knowledge and procedures in a sequenced and adequate way of this Subject, it is recommended to have passed the subject of Graphic Expression (Course 1)

2. Learning goals

2.1. Competences

Upon passing the subject, the student will be more competent to ...

GI03: Knowledge of basic and technological subjects, enabling them to learn new methods and theories, and provide them with versatility to adapt to new situations.

GI04: Ability to solve problems with initiative, decision making, creativity, critical thinking and to communicate and convey knowledge, abilities and skills in the field of Industrial Engineering

GC02: Interpret experimental data, contrast them with the theoretical ones and draw conclusions.

GC03: Ability for abstraction and logical thinking.

GC04: Ability lifelong, self-directed and independent learning

GC05: Ability to evaluate alternatives.

GC07.- Leading a team or being a committed member of it.

GC08: Ability to locate technical information, as well as its understanding and evaluation.

GC10.- Produce technical documentation and present it with the help of appropriate computer tools.

GC11.- Communicate their thinking and design clearly.

EB05.- Get space vision and knowledge of graphic representation techniques, both by metric and descriptive geometry traditional methods, such as CAD-CAE applications

2.2. Learning goals

The student, to pass this subject, must demonstrate the following results ...

1. Interprets and prepares multidisciplinary plans.

2. Identifies the most appropriate techniques for the representation of parts, diagrams and industrial assemblies or functional units.

3. Applies the corresponding regulations in the graphic representation of plans and diagrams typical to their Degree

4. Has a good command in the solving of graphic problems that may arise in engineering

5. Acquires the abstraction ability to view objects from different positions in space.

6. Collects information from different sources and formats, and understands, globally, that information.

7. Manages the necessary CAD / CAE tools, making the diagrams and exploded views of the components-parts that make up a set or functional unit, using the computer tools, in accordance with standardization, both in 2 and 3 dimensions.

2.3. Importance of learning goals

This subject has a clear engineering and communication language nature, that is, it offers

training with application content and immediate development, necessary for the production of reports or technical documents in different subjects of the degree, as well as in the labor and professional market. Therefore, it has a cross-curricular nature, of particular relevance, in those subjects with content of graphic design and, more specifically, those concerning Technical Office and Degree Projects.

Through the achievement of the relevant learning outcomes, the necessary skills to learn about and understand the rules and techniques of graphic representation, either through traditional methods, or through DAO applications.

3. Assessment (1st and 2nd call)

3.1. Assessment tasks (description of tasks, marking system and assessment criteria)

CONTINUOUS ASSESSMENT.

- Ÿ Participation (20%): Activities and work posed in class; Attitude and direct observation of skills and abilities in the subject.
- Ÿ Individual / Group Work -CAD-CAE- (40%): Posed work
- Ÿ Assessment test (40%): Test of practical application of concepts and procedures.

All the sections will have a summative value as long as the lowest mark in each one is 4

Students who have not passed any of the sections in the continuous assessment must go in for the respective calls of that part not passed or, where appropriate, make suitable corrections.

FINAL ASSESSMENT GLOBAL TEST

The student must opt ??for this modality when, due to their personal situation, they cannot adapt to the learning-teaching pace required in the continuous assessment system, they have failed their or they would like to improve their grade having participated in that assessment system.

Individual Work -CAD-CAE- (50%): Posed work

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

All the sections will have a sum value as long as the value in each one is> 4

4. Methodology, learning tasks, syllabus and resources

4.1. Methodological overview

The learning process that has been designed for this course is based on:

1. Lectures: Theory explained by the teacher, dealing with the theoretical principles of the subject, highlighting major concepts and framing them into topics and / or sections and relating them to each other. In the non-classroom mode, adapted audio-visual teaching material and specific software will be used for independent monitoring of the course.

2. Classroom practice activities / seminars / lab tasks: Practical CAD-CAE application activities in the appropriate laboratory, and theoretical discussion activities that require high participation of the student will be carried out In the non-classroom mode, adapted audio-visual teaching material and specific software will be used for independent monitoring of the course.

3. Tutorials: Concerning any issues of the course, face-to-face mode, in the scheduled timetable or via the Moodle platform messaging and forum.

"If classroom teaching were not possible due to health reasons, it would be carried out on-line."

4.2. Learning tasks

Lectures and laboratory practice activities. They will take place four hours per week, until the completion of 60 hours necessary to cover the agenda.

Laboratory practice activities . They will be carried out in subgroups adapted to the room of the laboratory.

Study and personal work. This non-classroom part is worth about 90 hours, necessary for the study of theory, problem solving and note review

Non-classroom generic activities and tutorials. Each teacher will announce a timetable of student assistance throughout the semester

4.3. Syllabus

The course will address the following topics:

Essential Contents of the subject for the achievement of learning outcomes

INTRODUCTION

- Program and presentation of the course
- Digital prototypes
- CAD Modeling
- Blueprints generation

ELEMENTS AND SETS

- Assembly restrictions
- Special mechanical elements
- Welded sets
- Metal sheet and metal sheet generator

ANALYSIS

- preprocessor
- boundary conditions
- load hypothesis
- solve and post-processing of the solution
- documentation

4.4. Course planning and calendar

Lecture, problem-solving classes and practical sessions in the laboratory are given as scheduled by the School, and they are posted, prior to the beginning of the course, on the EUPLA website, as well as the corresponding tutorial periods

The most relevant dates -Planning of the Course- (initial test, work proposals, delivery and presentations) will be announced in class, at the beginning of the course and in the Moodle Virtual Platform.

The weekly schedule of the course will be officially posted on

http://www.eupla.unizar.es/asuntos-academicos/calendario-y-horarios

The dates of the global asessment test (official calls) will be those officially posted

on http://www.eupla.unizar.es/asuntos-academicos/examenes

4.5. Bibliography and recommended resources

RESOURCES:

- Access to the subject documentation using the Moodle platform
- http://psfunizar10.unizar.es/br13/egAsignaturas.php?codigo=28837