Universidad Zaragoza

Academic Year/course: 2021/22

30167 - Computer Assisted Design

Syllabus Information

Academic Year: 2021/22
Subject: 30167 - Computer Assisted Design
Faculty / School: 175 - Escuela Universitaria Politécnica de La Almunia
Degree: 425 - Bachelor's Degree in Industrial Organisational 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 Knowledge and application of CAD / CAM / CAE programs and their use as a 2 and 3D representation tool.

Ÿ Knowledge of design, simulation, analysis and manufacturing-assembly software.

Ÿ Making and printing of blueprints in accordance with current regulations regarding Industrial Drawing.

ŸDevelopment of independent work and decision-making based on technical criteria using graphic solutions.

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 ...

C07.- Ability to use the engineering techniques, skills and tools necessary for the practice of the profession

C09.- Ability to work in a multidisciplinary group and a multilingual environment

C11.- Ability for lifelong learning and development of independent learning strategies

C14.- Basic knowledge about the use and programming of computers, operating systems, databases, and engineering application software.

C16.- Ability for Spatial vision and knowledge of graphic representation techniques, using both metric and descriptive geometry traditional methods, and computer aided design applications

C21.- Knowledge of the principles of machine and mechanism theory.

C29.- Knowledge and skills for the design, management and organization of production and logistic systems in business

C33.- Knowledge of automation basics of and control methods.

2.2. Learning goals

Students, to pass this subject, must produce the following results ...

1. Model or solve environments focused on the design of optimized factory drawings to achieve efficiency, quality and flexibility.

2. Size elements/machines according to technical specifications and functionality.

3. Understand, order and transmit the information obtained from different sources.

4. Design or analyze, using computer tools, the behavior of parts, subsets or

systems-processes, in accordance with given operating requirements or requests.

5. Analyze the design to get a flow of materials, machine usage, and energy consumption

in the early stages of the design.

6. Present both orally and in writing the work done in a coherent way.

7. Motivation and self-learning ability

8. Preparation and interpretation of plans and diagrams according to the regulations and

appropriate symbols.

2.3. Importance of learning goals

This course will provide the student with a comprehensive set of mechanical, 3D and Plant design CAD tools, to produce, validate and document complete digital prototypes. The model obtained will be a 3D digital prototype and will help us display, simulate and analyze the operation of a product or a component in real conditions before manufacturing. This helps engineers reach the market faster using fewer physical prototypes and create more innovative products.

3. Assessment (1st and 2nd call)

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

The student must demonstrate that they have achieved the expected learning outcomes through the following assessment activities

1.- Continuous Assessment System

Ÿ Participation (20%) .- Activities and tasks suggested in class; Attitude and direct observation of subject skills and abilities. Group work skills.

Ÿ Individual work (80%): Production of individual final project-like work for the course.

2.- Final Assessment Global Test

Following the regulations of the University of Zaragoza in this regard, in courses that offer continuous assessment, a global evaluation test will be scheduled for those students who decide to opt for this second system.

4. Methodology, learning tasks, syllabus and resources

4.1. Methodological overview

The organization of teaching will be done following the guidelines below:

Ÿ Theory / practical classes: The concepts and procedures of the subject will be explained and developed simultaneously, developing illustrative practical examples as support (in class and in individual and / or group tutorials), requiring a high level of student participation monitored by the teacher. Computer practical application activities will be carried out for the production of digital prototypes applying the different tools and obtaining as much information as necessary for their design, analysis, manufacturing and / or assembly. In the non-classroom mode, adapted audio-visual teaching material and specific software will be used for independent monitoring of the course.

Ÿ Individual and / or group tutorials: Tutorials concerning any issues of the course face-to-face or virtual in streaming at the scheduled timetable or through messaging and Moodle virtual classroom forum

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

4.2. Learning tasks

The program offered to the student to help them achieve the expected outcomes includes activities that involve the active participation of students

ŸTheory-practical classes (60h): The theoretical concepts of the subject will be explained and l illustrative practical examples developed to support the theory when necessary. Concepts and procedures of computer tools, particularly those of CAD-CAE, will be applied.

ŸMonitored practical work-Tutorials: Monitored practical tasks, work and exercise follow-up, which includes assistance and individualized or group attention, as appropriate, during tutorial timetable.(Posted on the EUPLA website)

4.3. Syllabus

The course will address the following topics:

INTRODUCTION

- Program and presentation of the course
- Tools for Factory Design
- 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

http://psfunizar10.unizar.es/br13/egAsignaturas.php?codigo=30167

RESOURCES:

- Access to the subject documentation using the Moodle platform