Universidad Zaragoza

Academic Year/course: 2021/22

29703 - Graphic expression and computer aided design

Syllabus Information

Academic Year: 2021/22
Subject: 29703 - Graphic expression and computer aided design
Faculty / School: 110 - Escuela de Ingeniería y Arquitectura
Degree: 434 - Bachelor's Degree in Mechanical Engineering
ECTS: 6.0
Year: 1
Semester: 434-First semester o Second semester
107-First semester
Subject Type: Basic Education
Module:

1. General information

1.1. Aims of the course

The course and its provided results answer to the following plans and objectives.

- Basic professional knowledge.
- Learning skill.
- Analysis and synthesis skill.
- Innovating skill.
- Solving problems skill.
- Applying knowledge to practical action skill.
- Oral and written communication skill.
- Work responsibility.
- Work motivation.
- Independent work skill.
- Human relationships skill.
- Quality and improvement commitment.

It is a course whose contents by themselves still do not give skills to the student to contribute to the achievement of the 2030 Agenda, however they are essential to substantiate the subsequent knowledge of the rest of the degree that is more directly related to the SDGs and therefore the 2030 Agenda.

1.2. Context and importance of this course in the degree

The course aims to form the students for the design and graphical representation of geometrical figures, industrial parts and diverse objects, through the use of a universal language that allows its understanding by other technical personnel and its subsequent manufacturing process, and that follows the rules of the International Standards Organization - ISO.
Furthermore, on the base of this course, the rest of the courses with industrial drawing, design, technical office and projects contents of the degree are built.

1.3. Recommendations to take this course

The student needs to know the contents of the Technical Drawing course of Bachillerato, specially the methods and constructions of: triangles, quadrilateral shapes, regular polygons, locuses, technical curves, conical and cyclical curves, and a introduction to the multiview projection.

2. Learning goals

2.1. Competences

Specific competences:

C9: Spatial vision capability and graphical representation techniques knowledge, through traditional methods of metric and descriptive geometry, and through computer aided design and drafting applications.

Generic competences:

C6: Capability for the use of the techniques, skills and tools that are needed for the practise of the engineering.

C10: Capability for continuous learning and developing autonomous learning strategies.

2.2. Learning goals

1. Masters the resolution of problems that can arise in engineering.

2. Develops dexterities and abilities that allow expressing precisely, clearly and objectively graphical solutions.

3. Acquires the abstraction capability to view objects from different spatial positions.

2.3. Importance of learning goals

The learning goals that are obtained through the course are important because:

- They allow mastering the resolution of the different graphical problems that can arise in engineering.

- They develop skills and abilities to express clearly, objectively and universally, graphic solutions.

- They improve the abstraction capabilities that allow you to see an object from different spatial positions.

- They value the possibilities of technical drawing as a research tool.

- They value the possibilities of standardization as an ideal conventionalism to simplify, not only production, but also communication, appreciating the universality of the objective language in the transmission and understanding of information.

3. Assessment (1st and 2nd call)

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

The student will have to show that has reached the learning goals through the next assesment tasks:

The assesment of the course will have two important calls that are provided in the official calendar, 1st and 2nd. It would be made in a different way for the CADD subject of the course versus the rest of the syllabus.

3.1.1 Computer Aided Design and Drafting (CADD):

Its preferred assessment system will be continuous, but optionally it can be done through global exam.

CADD practices:

After the presentation of each of the six CADD practices, a grade will be awarded. The weighted sum of those grades will made the final CADD practices grade. This grade will be valid for both calls.

CADD global exam:

If a student does not carry out the practices, does not obtain the minimum grade to average or if he prefers, he will carry out in the global exam a specific practical exercise of CADD, on the dates determined by the official calendar of the EINA, which will result in the student's grade for this section. This note will be valid only in the call in which it is made.

For the final grade of the course, the CADD practices grade or, failing that, the CADD global exam grade will have a weight of 15%. The minimum grade to average with the rest is 4.0 out of 10.

With this assessment system, learning goals 2 and 3 will be evaluated.

3.1.2 Rest of the syllabus:

The rest of the syllabus is assessed in part by continuous assessment (optional) and in part by global assessment (mandatory).

Supervised Practices.

The continuous evaluation will consist of the evaluation of the supervised practices. These will consist of six voluntary supervised practices and six compulsory ones, which will be delivered throughout the term on the dates indicated and will receive a grade. The weighted sum of these notes will constitute the note of supervised practices. For the final grade of the subject, this note has a weight of 35%. The minimum grade in the section to average with the rest is 4.0 out of 10. This grade will be valid for both calls.

Global Exam

The global assesment will be carried out obligatorily by all the students who want to obtain a grade in the act of the course. It will be carried out by means of a global exam on the dates determined by the official calendar of the EINA. It will consist of a series of practical exercises on the rest of the syllabus. The minimum grade for each exercise to average and obtain the

exam grade must be 1.0 out of 10. Once the exam grade has been obtained, the minimum grade for this exam to average with the others is 4.0 out of 10. This grade will be valid only in the call in which it is made.

If a student obtains the minimum grade of 4.0 out of 10 in supervised practices, then for the final grade of the course, the grade of the global exam for the rest of the syllabus will have a weight of 50%.

If a student does not take supervised practices, does not obtain the minimum grade, or if he prefers it, then for the final grade of the subject, the global exam for the rest of the syllabus will have a weight of 85%.

At any time throughout the term, a student may waive the continuous assessment of the rest of the syllabus and continue with the global assessment.

With this assessment system, learning outcomes 1, 2 and 3 will be evaluated.

Final grade

If a student does not take the global exam, his or her grade for the course will be Not presented.

If a student does not reach the minimum grades to average, his or her grade for the course will be Suspense and the numerical grade will be the grade for the section that limits the average.

If a student reaches the minimum grades to average, her final grade in the course will be obtained as the weighted sum of the grades to consider. To obtain the pass grade, a minimum grade of 5.0 out of 10 will be required.

4. Methodology, learning tasks, syllabus and resources

4.1. Methodological overview

The methodology followed in this course is oriented towards the achievement of the learning objectives. It is based on participation and the active role of the student favours the development of communication and decision-making skills. A wide range of teaching and learning tasks are implemented, such as lectures, guided assignments, laboratory sessions, autonomous work, and tutorials.

Students are expected to participate actively in the class throughout the semester.

Further information regarding the course will be provided on the first day of class.

4.2. Learning tasks

The course includes 6 ECTS organized according to:

- Lectures: theory and practise sessions (1.8 ECTS): 45 hours.
- Laboratory sessions (0.7 ECTS): 18 hours.
- Guided assignments (0.5 ECTS): 12 hours.
- Autonomous work (2.8 ECTS): 70 hours.
- Tutorials (0.2 ECTS): 5 hours.

Lectures: the professor will explain the theoretical contents of the course and solve illustrative applied problems. These problems and exercises can be found in the problem set provided at the beginning of the semester. Lectures run for 3 weekly hours. Although it is not a mandatory activity, regular attendance is highly recommended.

Laboratory sessions: sessions will take place every 2 weeks (5 sessions in total) and the last 3.0 hours each. Students will work together in groups actively doing tasks such as practical demonstrations, measurements, calculations, and the use of graphical and analytical methods.

Guided assignments: students will complete assignments, problems and exercises related to concepts seen in laboratory sessions and lectures. They will be submitted at the beginning of every laboratory sessions to be discussed and analyzed. If assignments are submitted later, students will not be able to take the assessment test.

Autonomous work: students are expected to spend about 75 hours to study theory, solve problems, prepare lab sessions, and take exams.

Tutorials: the professor's office hours will be posted on the degree website to assist students with questions and doubts. It is beneficial for the student to come with clear and specific questions.

4.3. Syllabus

The course will address the following topics:

Standardization and Industrial Drafting

- Introduction to Graphic Expression.
- Standardization and Computer Aided Design.
- Tools and equipment for drafting.
- Formats, scales, line types and writing.
- Diedric views. Representation of threads and gears.
- Cuts and sections.
- Dimensioning.

Multiview projection: Topographical System

- Representation of the point, the line and the plane.
- Status of lines in a plane.
- Find the given slope plane passing through a line.
- Intersection of lines and planes.
- Resolution of roofs of buildings.

Multiview projection: Diedric system

- Representation of point, line and plane.
- Intersection of lines and planes.
- Parallelism.
- Perpendicularity.
- Change of Plans Projection.
- Partial View Single and Double.
- Giration.
- Projection elements to a plane.
- Measurement of distances.
- Measurement of angles.

Surfaces

- Contour apparent and representation of surfaces.
- Defining and building surfaces.
- Flat sections and intersection straight.
- Intersection of surfaces.
- Development of surfaces.
- Applications: Elbows and adapters.

PRACTICAL CLASSES.

1. Explanation Command CAD package. Drawing, guided by the teacher, a one part 2D blueprint.
2. Making a single part 2D blueprint medium complexity.
3. Individual making a part 2D blueprint of high complexity.
4. Using symbol libraries with blocks and attributes in blueprints.
5. Creating a complete blueprint with title block and file printing from individual hand-drafting.

4.4. Course planning and calendar

For further details concerning the timetable, classroom and further information regarding this course please refer to the "Escuela de Ingeniería y Arquitectura " website (https://eina.unizar.es/)

4.5. Bibliography and recommended resources

http://biblioteca.unizar.es/como-encontrar/bibliografia-recomendad