25868 - Graphic Expression I

Syllabus Information

Academic Year: 2022/23
Subject: 25868 - Graphic Expression I
Faculty / School: 110 - Escuela de Ingeniería y Arquitectura
Degree: 558 - Bachelor's Degree in Industrial Design and Product Development Engineering
ECTS: 6.0
Year: 1
Semester: Second semester
Subject Type: Basic Education
Module:

1. General information

1.1. Aims of the course

The subject of Graphic Expression I aims for the student to be able to prepare the technical graphic documentation associated with the development of a product. This graphic documentation includes assembly drawings and drawings of individual components and parts, which will be made using different means, in particular, computer-aided design tools.

In addition, the subject aims to develop spatial vision and the ability to abstract, solve graphic problems using different representation systems and work on the realistic representation of the product by applying conical perspective and incorporating shadows.

It is a subject whose evaluable contents by themselves still do not give the student direct capacities to contribute to the achievement of the 2030 Agenda, however they are essential to base the subsequent knowledge of the rest of the degree, which will be more directly related to the Sustainable Development Goals and the 2030 Agenda.

1.2. Context and importance of this course in the degree

This subject provides basic knowledge to design from elementary geometric figures to diverse types of products, through a universal language that makes them easier for other people to understand orcarry out its manufacture.

Starting from the previous knowledge of the student in Technical Drawing and following a coordinated process in the achievement of objectives, the subject provides the necessary knowledge to face the Graphic Expression II and Computer Aided Design I subjects, which are taught in the first semester of 2nd degree course.

In addition, the subject provides the necessary knowledge and skills to carry out, with a sufficient level of graphic development, a first Design Project (1st year Module Project). The development of this type of projects encompasses and connects objectives of all subjects involve in a semester.

1.3. Recommendations to take this course

The student must have background knowledge of Technical Drawing and specifically of:

- Paths and constructions of basic geometry.
- Dihedral: representation of point, line and plane, management of projections and traces.
- Systems of representation: axonometric, caballera and conical perspective.
- Representation of views of an object and dimensioning.

2. Learning goals

2.1. Competences

BASIC COMPETENCES

CB01. Students have demonstrated knowledge and understanding in a field of study that is part of the general secondary educationcurricular, and is typically at a level which, although it is supported by advanced textbooks, includes some aspects that involve knowledge of the forefront of their field of study.

CB02. Students can apply their knowledge to their work or vocation in a professional manner and have competences typically demonstrated through devising and defending arguments and solving problems within their field of study.

CB03. Students have the ability to gather and interpret relevant data (usually within their field of study) to inform judgments that include an important reflection on social, scientific or ethical issues.

CB04. Students can communicate information, ideas, problems and solutions to both specialist and non-specialist audiences.

CB05. Students have developed those skills needed to undertake further studies with a high degree of autonomy.

GENERAL COMPETENCES

GC06. Ability to generate the necessary documentation for the proper transmission of ideas through graphics, reports and technical documents, models and prototypes, oral presentations in Spanish and other languages.

GC07. Ability to use and master techniques, skills, tools and techniques and communication and others specific of design engineering needed for design practice.

GC08. Ability to learn continuously, to develop autonomous learning strategies and to work in multidisciplinary groups with motivation and determinationto achieve goals.

SPECIFIC COMPETENCES

SC04. Capacity of spatial vision and knowledge of graphic representation techniques, both traditional methods of metric geometry and descriptive geometry, such as through applications of computer-aided design.

2.2. Learning goals

1. Dominate the fundamentals of industrial drawing to apply them to the realization and interpretation of plans, both as a whole and exploded, and to develop reasoned solutions to geometric problems in both, plane and space.
2. Value normalization as an ideal convention to simplify not only production but also communication, giving it universal character.
3. Develop your spatial vision.
4. Develop their ability to conceive and precisely define complex shapes and geometries.
5. It is capable of representing and communicating complex shapes and geometries through standardized graphic language.

2.3. Importance of learning goals

The learning results obtained in the subject are important for the students since they allow:
- Master the resolution of graphic problems that may arise in Engineering.
- Develop skills and abilities that allow graphic solutions to be expressed with precision, clarity, objectivity and universality.
- Apply normalization as an objective tool in the transmission and understanding of information.
- Acquire the ability to visualize objects from different positions in space.
- Assess the possibility of technical drawing as a language and research tool.

3. Assessment (1st and 2nd call)

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

The final grade of the subject will be made from:

i. Examens and Tests.
ii. Works and Practices

i) The student will have two calls, on the dates scheduled by the Center, to take the Knowledge Assessment Examens. These tests will consist of different exercises related to the resolution of graphic problems. They will have an assessment of 50% of the final note for the subject. They will be graded from 0 to 10. The student must obtain a minimum note of 4.5 to average.

ii) Works and Practices of the student. These works will be prepared and delivered during the class development period, on the dates indicated at the beginning of the course. They will have an assessment of 50% of the final note for the subject. They are graded from 0 to 10. The student must obtain a minimum note of 4.5 to average.

The Global Assessment Tests will consist of exercises, graphic problems and tasks similar to those contemplated in sections i and ii.

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 and is based on theory sessions, practice sessions, laboratory, and supervised activities:

- Lecture. Exposition and development of theoretical concepts using different tools.
- Practice sessions. Development of problems and type exercises by the student under the supervision of the teacher.
- Laboratory sessions. Exposition of practical contents and use of Computer-Aided Design (CAD) tools.
- Supervised activities. Autonomous works that will be individually supervised by the teacher.

Students are expected to participate actively in the class throughout the semester. Classroom materials will be available via Moodle. These include a repository of the lecture notes used in class, the course syllabus, as well as other course-specific learning materials. Further information regarding the course will be provided on the first day of class.

4.2. Learning tasks

The course includes the following learning tasks:

- Lectures (14 h). The teacher explains the course contents and solves representative applied problems. These problems and exercises can be found in the problem set provided at the beginning of the course. Regular attendance is highly recommended.
- Practice sessions (28 h). Students solve exercises and problems supervised by the teacher.
- Computer lab sessions (15 h). Sessions will take place every two weeks (5 sessions in total) and they last 3 hours each. Students will work individually doing tasks such as practices of computer-aided design.
- Autonomous work (87 h). Students are expected to spend about 87 hours studying theory, solve problems and prepare sessions. In addition, 6 hours are expected to spend to take exams.
- Tutorials: Teacher's office hours allow students to solve questions and discuss unclear course contents. It is advisable to come with clear and specific questions.

4.3. Syllabus

The course will address the following topics:

- Topic 1. Graphic documentation in design projects.
    - Introduction to Graphic Expression
    - Formats, scales, lines types and writing.
    - Mains views.
    - Cust and sections.
    - Dimensioning.
    - Introduction to drawing sets.

- Topic 2. Representation systems.
    - Axonometric system.
    - Dihedral system:
        - Representation of point, line and plane.
        - Parallelism and perpendicularity.
        - Change plans, spins and lowering the elements of a plane.
        - Surfaces and intersection representation.
        - Surfaces development.

- ○ Shades.
- ■ Conical perspective.

4.4. Course planning and calendar

Further information concerning the timetable, classroom, office hours, assessment dates and other details regarding this course will be provided on the first day of class or please refer to the EINA website (http://eina.unizar.es)

4.5. Bibliography and recommended resources

https://psfunizar10.unizar.es/br13/egAsignaturas.php?codigo=25868