# Engineering Graphics

**Academic Year: ( 2024 / 2025 )** **Review date: 04-02-2025**

**Department assigned to the subject: Mechanical Engineering Department**

**Coordinating teacher: MENESES ALONSO, JESUS**

**Type: Basic Core ECTS Credits : 6.0**

**Year : 1 Semester : 2**

**Branch of knowledge: Engineering and Architecture**

## REQUIREMENTS (SUBJECTS THAT ARE ASSUMED TO BE KNOWN)

Students are expected to have completed Technical Drawing in the high school, or the curso0 "Dibujo Técnico en Ingeniería"

## LEARNING OUTCOMES

RA1.1: Knowledge and understanding of the scientific and mathematical principles underlying their branch of industrial engineering.
RA2.1: The ability to apply their knowledge and understanding to identify, formulate and solve engineering problems using established methods.
RA3.2: An understanding of design methodologies, and an ability to use them.
RA4.3: Workshop and laboratory skills.
RA5.1: The ability to select and use appropriate equipment, tools and methods.
RA5.2: The ability to combine theory and practice to solve engineering problems.
CB1: Students have demonstrated possession and understanding of knowledge in an area of study that builds on the foundation of general secondary education, and is usually at a level that, while relying on advanced textbooks, also includes some aspects that involve knowledge from the cutting edge of their field of study.
CB2: Students are able to apply their knowledge to their work or vocation in a professional manner and possess the competences usually demonstrated through the development and defence of arguments and problem solving within their field of study.
CG1: Ability to resolve problems with initiative, creativity decision-making and critical reasoning skills, and to communicate and transmit knowledge, skills and abilities in the Industrial Engineering area.
CG3: Capacity to design a system, component or process in the area of electronic and automatic engineering in compliance with required specifications.
CG9: Knowledge and capacity to apply computational and experimental tools for analysis and quantification of electronic and automatic engineering problems.
CG15: Capacity for spatial vision and knowledge of graphic representation techniques, including traditional methods of metric geometry and descriptive geometry as well as computer-assisted design applications.

## OBJECTIVES

Upon successful completion of this subject, students will be able to:
1. Know, interpret and use the representation systems, their geometric foundation and the conventions and standardized symbols that underlie industrial design and computer-aided design.
2. Apply your knowledge and understanding to read, interpret and correctly develop industrial drafts.
3. Understand and use different methods to graphically express ideas, designs and projects in a precise, clear, unambiguous and standardized manner.
4. Develop technical level and computer-aided design laboratory tasks.
5. Select and use appropriate tools and methods to graphically document industrial designs.
6. Combine theory and practice to solve problems of engineering graphics.
7. Work effectively both individually and as a team

## DESCRIPTION OF CONTENTS: PROGRAMME

Standardized representation systems, dihedral and axonometric system in greater depth.
Standardized representation of basic industrial elements.
Dimensioning. Dimensional and geometric tolerances.
Geometric bases of Computer Aided Design.

## LEARNING ACTIVITIES AND METHODOLOGY

Magistral lectures, exercises in classroom and / or computer room, personal work and drafts elaboration, teamwork for mechanical modeling, assemblying and drafting.

## ASSESSMENT SYSTEM

| | |
|---|---|
| **% end-of-term-examination:** | 49 |
| **% of continuous assessment (assigments, laboratory, practicals…):** | 51 |

The content of the subject can be divided into three parts; In addition, the evaluation system is composed by CONTINUOUS ASSESSMENT and FINAL EXAM. Below are the percentage with which each item contributes to the final grade:

CONTINUOUS ASSESSMENT
TR: Subject work (Computer-aided design), delivered exercises, etc: 30%
EC1: Partial exam part 1. 4.5%, if not passed. 15% if passed (F1 exempt in Ordinary call)
EC2: Partial exam part 2. 7.5%, if not passed. 25% if passed (F2 exempt in Ordinary call)
EC3: Partial exam part 3. 9%, if not passed. 30% if passed (F3 exempt in Ordinary call)

FINAL EXAM
F1: Final exam part 1. 10.5%. Exempt (in Ordinary call) if EC1 is passed
F2: Final exam part 2. 17.5%. Exempt (in Ordinary call) if EC2 is passed
F3: Final exam part 3. 21%. Exempt (in Ordinary call) if EC3 is passed

In ordinary call, it is required to pass.
- A total score grater than or equal to 5.
- A minimum of 35% in each made part of the final exam.
- A minimum of 35% in the computer-aided design part.

In extraordinary call, no part is exempt. The grade will be the most beneficial among the cases: i) 100% of the final exam and ii) 10.5%, 17.5% and 21% of F1, F2 and F3 respectively, plus 4.5%, 7.5% and 9% of the partial EC1 , EC2 and EC3 respectively, plus 30% of TR

In extraordinary call, a minimum of 35% of the exam is required to pass.

The percentage distribution between CONTINUOUS EVALUATION and FINAL EXAM ranges from 51% - 49%, if none of the partial exam is passed, to 100% - 0% if all the partial exams are passed. Only in extraordinary call, case i), the distribution is 0% -100%

## BASIC BIBLIOGRAPHY


- B. Ramos Barbero y E. García Maté Dibujo Técnico, AENOR, 2006

- C. Preciado y F.J. Moral Normalización del dibujo técnico, Donostiarra, 2009

- F. J. Rodríguez de Abajo y R. Galarraga Normalización del dibujo industrial, Donostiarra, 1993

- González Monsalve y Palencia Cortés Geometría Descriptiva., Autores., 1991

- Izquierdo Asensi Geometría Descriptiva, Paraninfo, 2000

- J. Félez y M. L. Martínez Dibujo Industrial, Síntesis., 2000

## BASIC ELECTRONIC RESOURCES

- Grupo de Expresión Gráfica de la UC3M . SPOC de la asignatura: http://spoc.uc3m.es