

Academic Year: ( 2023 / 2024 )

Review date: 27-04-2023

Department assigned to the subject: Mechanical Engineering Department

Coordinating teacher: ALVAREZ CALDAS, CAROLINA

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  
Students will use a CAD software that is in Spanish.

## SKILLS AND LEARNING OUTCOMES

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 solve problems with initiative, decision-making, creativity, critical reasoning and to communicate and transmit knowledge, skills and abilities in the field of Industrial Engineering.

CG3. Ability to design a system, component or process in the field of Industrial Technologies to meet the required specifications

CG9. Knowledge and ability to apply computational and experimental tools for the analysis and quantification of Industrial Engineering problems.

CG15. Ability of spatial vision and knowledge of graphic representation techniques, both by traditional methods of metric geometry and descriptive geometry, and by computer-aided design applications.

RA1. Knowledge and understanding: Have basic knowledge and understanding of science, mathematics and engineering within the industrial field, as well as knowledge and understanding of Mechanics, Solid and Structural Mechanics, Thermal Engineering, Fluid Mechanics, Production Systems, Electronics and Automation, Industrial Organisation and Electrical Engineering.

RA2. Engineering Analysis: To be able to identify engineering problems within the industrial field, recognise specifications, establish different resolution methods and select the most appropriate one for their solution

RA3. Engineering Design: To be able to design industrial products that comply with the required specifications, collaborating with professionals in related technologies within multidisciplinary teams.

RA4. Research and Innovation: To be able to use appropriate methods to carry out research and make innovative contributions in the field of Industrial Engineering.

RA5. Engineering Applications: To be able to apply their knowledge and understanding to solve problems and design devices or processes in the field of industrial engineering in accordance with criteria of cost, quality, safety, efficiency and respect for the environment.

## 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

1. Standardized representation systems.
  - 1.1. Ortographic projection
  - 1.2. Isometric projection
2. Representation of industrial assemblies
  - 2.1. Representation of parts
  - 2.2. Dimensioning
  - 2.3. Standardized representation of basic industrial elements
  - 2.4. Representation of industrial assemblies
3. Dimensional and geometric tolerances
4. Computer Aided Design

## LEARNING ACTIVITIES AND METHODOLOGY

Magistral lectures, exercises in classroom and / or computer room, personal work and drafts elaboration.

## ASSESSMENT SYSTEM

Items with evaluation percentages are indicated

Continuous assessment

TR: Subject work, delivered exercises, computer classroom exercises, etc: 30%

EC1: Partial exam part 1. 4,5%, if not passed. 15% if passed (F1 exempt in Ord. Conv.)

EC2: Partial exam part 2. 7,5%, if not passed. 25% if passed (F2 exempt in Ord. Conv.)

EC3: Partial exam part 3. 9%, if not passed. 30% if passed (F2 exempt in Ord. Conv.)

Final exam

F1: Final exam part 1. 10,5%. Exempt (in Ord. Conv.) If P1 is passed

F2: Final exam part 2. 17,5%. Exempt (in Ord. Conv.) If P2 is passed

F3: Final exam part 3. 21%. Exempt (in Ord. Conv.) If P1 is passed

To pass the subject, it is necessary to obtain a minimum of 35% of each part of the exam and in the CAD part.

The final mark must be at least 5.

In extraordinary call, no part is exempt. The qualification will be the most beneficial among the cases i) 100% of the 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

To have the chance of ii) you must obtain a minimum of 35% of the exam

<b>% end-of-term-examination:</b>	49
<b>% of continuous assessment (assignments, laboratory, practicals...):</b>	51

## BASIC BIBLIOGRAPHY

- J. Félez y M. L. Martínez Dibujo industrial, Síntesis.
- Meneses, Álvarez, Rodríguez Introducción al Solid Edge, Paraninfo.

## ADDITIONAL BIBLIOGRAPHY

- B. Ramos Barbero y E. García Maté Dibujo Técnico, AENOR.
- C. Preciado y F.J. Moral Normalización del dibujo técnico, Ed. Donostiarra.
- F. J. Rodríguez de Abajo y R. Galarraga Normalización del dibujo industrial, Ed. Donostiarra, 1993
- Izquierdo Asensi Geometría Descriptiva, Autor.
- Varios autores Normas UNE, UNE.

## BASIC ELECTRONIC RESOURCES

- Grupo de EG de la UC3M . SPOC de la asignatura: <https://spoc.uc3m.es/>