

**1. General information****Course:** ENGINEERING GRAPHICS I**Type:** BASIC**Degree:** 352 - UNDERGRADUATE DEGREE PROGRAMME IN MECHANICAL ENGINEERING (AB)**Center:** 605 - SCHOOL OF INDUSTRIAL ENGINEERS. AB**Year:** 1**Main language:** Spanish**Use of additional languages:****Web site:****Code:** 56305**ECTS credits:** 6**Academic year:** 2023-24**Group(s):** 14 15 16**Duration:** C2**Second language:** English**English Friendly:** Y**Bilingual:** N**Lecturer:** MARIA DE LAS NIEVES SANCHEZ CASADO - Group(s): 14 15 16

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2. Pre-Requisites

It is necessary that the students have skills to use the drawing tools and some previous knowledge as following:

- Basic concepts of geometry and trigonometry.
- Basic skills in 3D-space perception.
- Basic skills the technical tools: drawing tools and computer skills.

3. Justification in the curriculum, relation to other subjects and to the profession

This subject belongs to the basic learning in the Degree framework. The learning competences which are expected can be summarize in: 1) vision and resolution of 3D-problems, 2) reading and interpretation of pieces plans, 3) appropriate apply of the standardization in technical drawings.

The concepts deal in this subject will be used in next others mandatory subjects in this Degree which are common to the Industrial branch like Technical Drawing II, CAD Techniques, Engineering Projects, among others.

4. Degree competences achieved in this course**Course competences**

Code	Description
A01	To understand and have knowledge in an area of study that moves on from the general education attained at secondary level and usually found at a level that, while supported in advanced text books, also includes some aspects that include knowledge found at the cutting edge of the field of study.
A02	To know how to apply knowledge to work or vocation in a professional manner and possess the competences that are usually demonstrated by the formulation and defence of arguments and the resolution of problems in the field of study.
A07	Knowledge of Information Technology and Communication (ITC).
A12	Knowledge of basic materials and technologies that assist the learning of new methods and theories and enable versatility to adapt to new situations.
A13	Ability to take the initiative to solve problems, take decisions, creativity, critical reasoning and ability to communicate and transmit knowledge, skills and abilities in Mechanical Engineering.
A15	Ability to work to specifications and comply with obligatory rules and regulations.
B05	Spatial awareness and knowledge of graphical representation techniques, both through traditional geometrical measurements and descriptive geometry, as well as through the application of computer assisted design.
CB01	Prove that they have acquired and understood knowledge in a subject area that derives from general secondary education and is appropriate to a level based on advanced course books, and includes updated and cutting-edge aspects of their field of knowledge.
CB02	Apply their knowledge to their job or vocation in a professional manner and show that they have the competences to construct and justify arguments and solve problems within their subject area.
CB03	Be able to gather and process relevant information (usually within their subject area) to give opinions, including reflections on relevant social, scientific or ethical issues.
CB04	Transmit information, ideas, problems and solutions for both specialist and non-specialist audiences.
CB05	Have developed the necessary learning abilities to carry on studying autonomously
D01	Knowledge and ability to apply graphic engineering techniques.

5. Objectives or Learning Outcomes**Course learning outcomes**

Description

6. Units / Contents

Unit 1:

Unit 2:

Unit 3:

Unit 4:

ADDITIONAL COMMENTS, REMARKS

This subject has 3 blocks:

Block 1. Representation systems (Lessons: 1, 2, 3, 4 and 7)

Block 2. Basic standardized representations (Lessons: 5 and 6)

Block 3. Fundamentals of Computer-Aided Design (Lessons: 8 and 9)

7. Activities, Units/Modules and Methodology

Training Activity	Methodology	Related Competences (only degrees before RD 822/2021)	ECTS	Hours	As	Com	Description
Class Attendance (theory) [ON-SITE]	Lectures	A01 A02 A07 A12 A15 B05 D01	0.8	20	N	-	Presencial lectures.
Problem solving and/or case studies [ON-SITE]	Problem solving and exercises	A01 A02 A07 A12 A13 A15 B05 CB01 CB02 CB03 CB04 CB05 D01	0.8	20	Y	N	Presencial activities with technical drawing tools.
Class Attendance (practical) [ON-SITE]	Practical or hands-on activities	A01 A02 A07 A12 A13 A15 B05 CB01 CB02 CB03 CB04 CB05 D01	0.6	15	Y	N	CAD software.
Formative Assessment [ON-SITE]	Assessment tests	A01 A02 A07 A12 A13 A15 B05 CB01 CB02 CB03 CB04 CB05 D01	0.2	5	Y	Y	
Study and Exam Preparation [OFF-SITE]	Self-study	A01 A02 A07 A12 A13 A15 B05 CB01 CB02 CB03 CB04 CB05 D01	3.6	90	Y	N	
Total:			6	150			
Total credits of in-class work: 2.4			Total class time hours: 60				
Total credits of out of class work: 3.6			Total hours of out of class work: 90				

As: Assessable training activity

Com: Training activity of compulsory overcoming (It will be essential to overcome both continuous and non-continuous assessment).

8. Evaluation criteria and Grading System

Evaluation System	Continuous assessment	Non-continuous evaluation*	Description
Projects	15.00%	15.00%	The works of board on Standardisation realised in the classroom will be valued.
Laboratory sessions	5.00%	5.00%	The works carried out on Standardisation by the student will be assessed.
Assessment of activities done in the computer labs	10.00%	10.00%	Evaluation of the competences acquired through a test in the equator of the subject.
Progress Tests	10.00%	0.00%	Evaluation of the competences acquired through a final global test of the subject.
Final test	60.00%	70.00%	
Total:	100.00%	100.00%	

According to art. 4 of the UCLM Student Evaluation Regulations, it must be provided to students who cannot regularly attend face-to-face training activities the passing of the subject, having the right (art. 12.2) to be globally graded, in 2 annual calls per subject, an ordinary and an extraordinary one (evaluating 100% of the competences).

Evaluation criteria for the final exam:

Continuous assessment:

The grade of the final test will be assessed with a maximum of 6 points, adding to it the score obtained by the different activities carried out during the course depending on their specific weight. The subject will be passed if the overall score of the sum of the different activities is equal to or greater than 5 points.

The student must overcome the compulsory activities. If block 3 is not approved in the continuous evaluation, the student must submit to a face-to-face test with a date subsequent to the final test.

If these criteria are not met, it will inevitably entail a global grade of the subject not exceeding 4 points.

Non-continuous evaluation:

Evaluation criteria not defined

Specifications for the resit/retake exam:

The subject will be passed if the overall score of the activities programmed in the extraordinary call is equal to or greater than 5 points.

If block 3 is not approved in the continuous evaluation, the student must submit to a face-to-face test with a date subsequent to the final test.

If these criteria are not met, it will inevitably entail a global grade of the subject not exceeding 4 points.

Those grades of the ordinary evaluation equal or superior to 5 points of the global of block 1 or of block 2 will be conserved in this call, exempting the student from attending the activities programmed for these blocks.

Specifications for the second resit / retake exam:

The subject will be passed if the overall score of the activities programmed in the special call for completion is equal to or greater than 5 points.

The student must overcome the compulsory activities: Achieve at least 3 points on 10 points in each of blocks 1 and 2. You must also achieve in block 3 a grade equal to or greater than 5 points.

If these criteria are not met, it will inevitably entail a global grade of the subject not exceeding 4 points.

9. Assignments, course calendar and important dates	
Not related to the syllabus/contents	
Hours	hours
Formative Assessment [PRESENCIAL][Assessment tests]	4
Unit 1 (de 4):	
Activities	Hours
Class Attendance (theory) [PRESENCIAL][Lectures]	15
Formative Assessment [PRESENCIAL][Assessment tests]	.5
Study and Exam Preparation [AUTÓNOMA][Self-study]	40
Unit 2 (de 4):	
Activities	Hours
Class Attendance (theory) [PRESENCIAL][Lectures]	2.5
Problem solving and/or case studies [PRESENCIAL][Problem solving and exercises]	10
Formative Assessment [PRESENCIAL][Assessment tests]	.25
Study and Exam Preparation [AUTÓNOMA][Self-study]	15
Unit 3 (de 4):	
Activities	Hours
Class Attendance (theory) [PRESENCIAL][Lectures]	2.5
Problem solving and/or case studies [PRESENCIAL][Problem solving and exercises]	10
Formative Assessment [PRESENCIAL][Assessment tests]	.25
Study and Exam Preparation [AUTÓNOMA][Self-study]	15
Unit 4 (de 4):	
Activities	Hours
Class Attendance (practical) [PRESENCIAL][Practical or hands-on activities]	15
Study and Exam Preparation [AUTÓNOMA][Self-study]	20
Global activity	
Activities	hours
Problem solving and/or case studies [PRESENCIAL][Problem solving and exercises]	20
Class Attendance (practical) [PRESENCIAL][Practical or hands-on activities]	15
Formative Assessment [PRESENCIAL][Assessment tests]	5
Study and Exam Preparation [AUTÓNOMA][Self-study]	90
Class Attendance (theory) [PRESENCIAL][Lectures]	20
Total horas: 150	

10. Bibliography and Sources						
Author(s)	Title/Link	Publishing house	Citv	ISBN	Year	Description
Rodríguez de Abajo, F.J.	Geometría Descriptiva, Tomo III. Perspectiva Axonométrica	Donostiarra		978-84-7063-466-6	2007	
Rodríguez de Abajo, F.J.	Geometría Descriptiva, Tomo IV. Sistema de perspectiva caballera	Donostiarra		978-84-7063-466-6	2007	
Félez, J., Martínez, M.L.	Ingeniería Gráfica y Diseño (3ª ed.)	Síntesis		978-84-9756-499-1	2008	
Chacón, J.M., Sánchez-Reyes, J.	Expresión Gráfica en Ingeniería Industrial	Donostiarra		978-84-7063-476-5	2013	
Gonzalo Gonzalo, J.	Prácticas de dibujo técnico nº 7. Iniciación al sistema diédrico	Donostiarra		978-84-7063-138-2	2007	
Fernández San Elias, G.	Prácticas de dibujo técnico nº 6. Vistas y visualización de formas	Donostiarra		978-84-7063-315-7	2004	
Gonzalo Gonzalo, J.	Prácticas de dibujo técnico nº 2. Cortes y secciones	Donostiarra		978-84-7063-316-4	2004	
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Méndez López, C.	Prácticas de dibujo técnico nº 11. Sistema de planos acotados	Donostiarra		978-84-7063-158-0	1998	
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	Geometría Descriptiva, Tomo I. Sistema					

Rodríguez de Abajo, F.J.	Diédrico	Donostiarra	978-84-7063-353-9	2007	
Guillamón Insa, A.	Análisis de formas y representaciones normalizadas	Ediciones UPCT	978-84-17853-44-0	2021	
	https://repositorio.upct.es/bitstream/handle/10317/10460/isbn9788417853440.pdf?sequence=1				
Gonzalo Gonzalo, J.	Prácticas de dibujo técnico nº 3. Acotación	Donostiarra	978-84-7063-317-1	2004	
Rodríguez de Abajo, F.J.	Geometría Descriptiva, Tomo II. Planos Acotados	Donostiarra	978-84-7063-182-5	1993	
Bertran i Guasp, J.	Geometría descriptiva: Sistema Diédrico Directo	Donostiarra	978-84-7063-197-9	2005	
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Álvarez Bengoa, V.	Prácticas de dibujo técnico nº 0. Dibujo lineal	Donostiarra	978-84-7063-129-0	1997	
Collado Sanchez-Capuchino, V.	Sistema de planos acotados: Sus aplicaciones en ingeniería	Tebar Flores	978-84-7360-087-3	1998	