

SUBJECT TEACHING GUIDE

G709 - Graphic Engineering

First Degree in Industrial Technologies Engineering

Academic year 2025-2026

1. IDENTIFYING DATA					
Degree	First Degree in Industrial Technologies Engineering			Type and Year	Compulsory. Year 2
Faculty	School of Industrial Engineering and Telecommunications				
Discipline	Subject Area: Graphic Engineering Module: Selection of Specific Technologies				
Course unit title and code	G709 - Graphic Engineering				
Number of ECTS credits allocated	6	Term	Semester based (2)		
Knowledge Field	Industrial engineering, mechanical engineering, automation engineering, industrial organization engineering and navigation engineering				
Web					
Language of instruction	Spanish	English Friendly	No	Mode of delivery	Face-to-face

Department	DPTO. INGENIERIA GEOGRAFICA Y TECNICAS DE EXPRESION GRAFICA				
Name of lecturer	VALENTIN GOMEZ JAUREGUI				
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Office	E.T.S. de Ingenieros Industriales y de Telecomunicación. Planta: - 2. DESPACHO (S2002)				
Other lecturers	FERNANDO FADON SALAZAR JOSE ENRIQUE CERON HOYOS				

4. OBJECTIVES					
<ul style="list-style-type: none"> - Application of technological aspects, functionality, form, and design of mechanical assemblies and their components. - Development of analytical and calculation skills required for the application of technological and industrial standards. - Analysis and application of the relevant industrial standards to achieve concise, detailed, and clear representations of mechanical assemblies and their components in technical drawings, which constitute one of the essential documents of a project. - Application and representation of symbols and specific aspects of installations related to different industrial sectors, such as electrical, mechanical, chemical, or electronic. - Execution of technical drawings and application of CAD systems with specialized modules. 					

6. SUBJECT PROGRAM	
CONTENTS	
1	1 TECHNOLOGICAL BACKGROUND: MANUFACTURING PROCESSES. METROLOGY. DIMENSIONING. 1.1 Representation of industrial facilities and specialized CAD applications. (Assemblies and explosions). Layouts. More about dimensioning. Standardization of dimensions.) 1.2. Manufacturing processes. (Surface finishes. Metrology. Dimensional tolerances. Adjustments. Geometric tolerances. Functional dimensioning. Transfer of dimensions.) 1.3. CAD / CAM / CAE systems.
2	2 REPRESENTATION OF INDUSTRIAL FACILITIES. SPECIALIZED CAD APPLICATIONS. 2.1. MECHANICAL JOINTS: Types of joints. Fixed joints: welded joints. Detachable joints: screws, bolts, pins, etc. Standards, 3D modeling and layout representation. 2.2. POWER TRANSMISSIONS: Axles, shafts, pins, bearings, grooved joints, gears, belts, chains, cams, springs, etc. Standards, 3D modeling, layout representation and dynamic simulation.
3	3 BACKGROUND OF INDUSTRIAL DESIGN. 3.1. CURVES AND SURFACES. Traditional classification of surfaces: translation, rotation, developable, ruled, etc. 3.2. SPLINES AND BLENDING FUNCTIONS. Hermite. Cardinal. Interpolation and approximation of curves and surfaces. Bezier curves and B-spline. Rational B-spline curves. Non-Uniform Rational B-Splines (NURBS).

7. ASSESSMENT METHODS AND CRITERIA				
Description	Type	Final Eval.	Reassessn	%
Block 1	Others	No	Yes	35,00
Block 2	Others	No	Yes	45,00
Block 3	Others	No	Yes	10,00
Practical work in the classroom	Others	No	No	10,00
TOTAL				100,00
Observations				
<p>-Attendance to class is highly recommended, as practical classroom activities related to the topics discussed during each session will be conducted and evaluated. These practical activities cannot be made up since they are sometimes solved orally, graphically on the board, or collaboratively.</p> <p>-The submission of weekly assignments is highly recommended, as they will assess the gradual acquisition of competencies for each subject topic.</p> <p>-There will be three partial exams, one for each block, which will constitute the regular assessment. If any of them is not passed, it can be retaken individually in the extraordinary assessment period, keeping the grades of the partial exams that were passed.</p> <p>NOTE: If the competent health and educational authorities so indicate, and do not allow some evaluation activities to be conducted in person in the classroom, a remote evaluation modality using telematic means will be adopted.</p>				
Observations for part-time students				
Part-time students must address the responsible teacher the first day of the course to receive the appropriate instructions. They shall be entitled to submit a single evaluation process. If properly justified the impossibility to attend the lectures, they will have to present a supplementary task.				

8. BIBLIOGRAPHY AND TEACHING MATERIALS

BASIC

Curso Moodle de la asignatura: <https://moodle.unican.es/login/index.php>
Ingeniería gráfica y diseño. Jesús Félez Mindán M.^a Luisa Martínez Muneta Ed. Síntesis
NORMAS UNE SOBRE DIBUJO. Ed. AENOR (Libre en la BUC y online en <https://web.unican.es/buc>)
OCW <http://ocw.unican.es/enseñanzas-tecnicas/ingenieria-grafica>
OCW <http://ocw.unican.es/enseñanzas-tecnicas/cad-3d>
OCW <http://ocw.unican.es/enseñanzas-tecnicas/diseño-asistido-por-ordenador>
Dibujo Técnico. Ediciones BACHMANN – FORBERG
Manual of Engineering Drawing. Colin H Simmons, Dennis E Maguire. Ed Elsevier
NORMALIZACIÓN DEL DIBUJO INDUSTRIAL. R. Villar del Fresno, R. García, J.L.Caro.
DIBUJO TÉCNICO. R. de Abajo y Alvarez. Ed. Donostiarra
F.FADON, J.E.CERÓN. Ingeniería Gráfica.