

## SUBJECT TEACHING GUIDE

G746 - Graphic Engineering

Degree in Mechanical Engineering

Academic year 2024-2025

1. IDENTIFYING DATA					
Degree	Degree in Mechanical Engineering			Type and Year	Compulsory. Year 2
Faculty	School of Industrial Engineering and Telecommunications				
Discipline	Subject Area: Graphic Engineering Module: Specific Mechanical Technology				
Course unit title and code	G746 - Graphic Engineering				
Number of ECTS credits allocated	6	Term	Semester based (2)		
Web	<a href="https://moodle.unican.es/login/index.php">https://moodle.unican.es/login/index.php</a>				
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				
E-mail	valen.gomez.jauregui@unican.es				
Office	E.T.S. de Ingenieros Industriales y de Telecomunicación. Planta: - 2. DESPACHO (S2002)				
Other lecturers	JOSE ANDRES DIAZ SEVERIANO				

### 3.1 LEARNING OUTCOMES

- After passing the course, students will have learned the theoretical and practical, fundamental and applied specific contents listed in the program.

#### 4. OBJECTIVES

Application of technological aspects, functionality, shape and design of the mechanical assemblies and components.
Development of analytical skills and calculation procedures required for the application of technological and industrial standards.
Analysis and application of the relevant industry standards, in order to achieve a concise, detailed and clear representation of the mechanical assemblies and components to be included in the layout, which must be one of the essential documents of a project.
Implementation and representation of symbols and specific aspects of facilities dedicated to different industrial sectors : with priority in the mechanical sector and with complementarity in the electrical, chemical or electronic sectors.
Design of layouts 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. Quadrics. Coons surfaces. 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	30,00
Block 2	Others	No	Yes	40,00
Block 3	Others	No	Yes	15,00
Practical work in the classroom	Others	No	No	15,00
<b>TOTAL</b>				<b>100,00</b>
<b>Observations</b>				
<p>- Attendance to class is highly recommended, because practical works in the classroom will be carried out about what was discussed during each of the sessions and therefore assessed. These practical activities are not recoverable since sometimes they will be solved orally, or graphically on the blackboard or in a collaborative way.</p> <p>- The presentation of weekly tasks is highly recommended, because they will serve to assess the gradual acquisition of skills in each of the themes of the subject.</p> <p>- The retrieval exam of each one of the blocks, if not passed, will be carried out in the extraordinary call.</p> <p>- NOTE: Given the current uncertain health situation, in case the competent health and educational authorities don't allow any physical evaluation in the classroom / lab, a distance evaluation modality will be adopted using online technologies.</p>				
<b>Observations for part-time students</b>				
<p>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.</p>				

8. BIBLIOGRAPHY AND TEACHING MATERIALS
<b>BASIC</b>
Curso Moodle de la asignatura: <a href="https://moodle.unican.es/login/index.php">https://moodle.unican.es/login/index.php</a>
INGENIERÍA GRÁFICA Y DISEÑO. Jesús Félez, M <sup>a</sup> Luisa Martínez. Editorial: Madrid : Síntesis, [2008] ISBN: 978-84-975649-9-1
MANUAL DE NORMAS UNE SOBRE DIBUJO. Ed. AENOR
Análisis de formas y representaciones normalizadas. Antonio Guillamón Insa (2021). Ediciones Universidad Politécnica de Cartagena. ISBN: 978-84-17853-44-0. URL: <a href="https://repositorio.upct.es/handle/10317/10460">https://repositorio.upct.es/handle/10317/10460</a>