SUBJECT TEACHING GUIDE

G746 - Graphic Engineering

Degree in Mechanical Engineering

Academic year 2019-2020

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					
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. COURSE ORGANIZATION

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 TRANSMISIONS: 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 1a	Written exam	No	Yes	15,00
Block 1b	Laboratory evaluation	No	Yes	30,00
Block 2a	Written exam	No	Yes	15,00
Block 2b	Laboratory evaluation	No	Yes	30,00
Block 3	Written exam	No	Yes	10,00
TOTAL				100,00

Observations

- Class attendance is mandatory.
- Submission of tasks is mandatory.

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
OCW http://ocw.unican.es/ensenanzas-tecnicas/cad-3d/programa
INGENIERÍA GRÁFICA Y DISEÑO. Jesús Félez, Mª Luisa Martínez. Editorial: Madrid : Síntesis, [2008] ISBN: 978-84-975649-9-1
MANUAL DE NORMAS UNE SOBRE DIBUJO. Ed. AENOR
http://ocw.upm.es/expresion-grafica-en-la-ingenieria/ingenieria-grafica-metodologias-de-diseno-para-proyectos