



Teaching Guide

Identifying Data					2021/22
Subject (*)	Manufacturing Process Engineering		Code	730497202	
Study programme	Mestrado Universitario en Enxeñaría Industrial (plan 2018)				
Descriptors					
Cycle	Period	Year	Type	Credits	
Official Master's Degree	1st four-month period	First	Obligatory	4.5	
Language	Spanish				
Teaching method	Face-to-face				
Prerequisites					
Department	Enxeñaría Naval e Industrial				
Coordinador	Amado Paz, José Manuel	E-mail	jose.amado.paz@udc.es		
Lecturers	Amado Paz, José Manuel	E-mail	jose.amado.paz@udc.es		
Web					
General description	Capacidade para deseñar e proxectar sistemas de produción automatizados e control avanzado de procesos Coñecementos para proxectar, calcular e deseñar sistemas integrados de fabricación.				
Contingency plan	<ol style="list-style-type: none"> 1. Modifications to the contents 2. Methodologies <ul style="list-style-type: none"> *Teaching methodologies that are maintained *Teaching methodologies that are modified 3. Mechanisms for personalized attention to students 4. Modifications in the evaluation <ul style="list-style-type: none"> *Evaluation observations: 5. Modifications to the bibliography or webgraphy 				

Study programme competences / results

Code	Study programme competences / results
A2	ETI2 - Knowledge and ability to project, calculate and design integrated manufacturing systems.
A3	ETI3 - Ability to design and test machines.
B1	CB6 - Possess and understand knowledge that provides a basis or opportunity to be original in the development and / or application of ideas, often in a research context.
B3	CB8 - That students are able to integrate knowledge and face the complexity of making judgments based on information that, being incomplete or limited, includes reflections on the social and ethical responsibilities linked to the application of their knowledge and judgments.
B4	CB9 - That the students know how to communicate their conclusions -and the knowledge and ultimate reasons that sustain them- to specialized and non-specialized audiences in a clear and unambiguous way.
B6	G1 - Have adequate knowledge of the scientific and technological aspects in Industrial Engineering.
B7	G2 - Project, calculate and design products, processes, facilities and plants.
B14	G9 - Be able to integrate knowledge and face the complexity of making judgments based on information that, being incomplete or limited, includes reflections on social and ethical responsibilities linked to the application of their knowledge and judgments.



B15	G10 - Knowing how to communicate the conclusions -and the knowledge and ultimate reasons that sustain them- to specialized and non-specialized publics in a clear and unambiguous way.
C1	ABET (a) - An ability to apply knowledge of mathematics, science, and engineering.
C2	ABET (b) - An ability to design and conduct experiments, as well as to analyze and interpret data.
C5	ABET (e) - An ability to identify, formulate, and solve engineering problems.
C6	ABET (f) - An understanding of professional and ethical responsibility.
C7	ABET (g) - An ability to communicate effectively.
C11	ABET (k) - An ability to use the techniques, skills, and modern engineering tools necessary for engineering practice.

Learning outcomes			
Learning outcomes	Study programme competences / results		
Capacidade para deseñar e proxectar sistemas de produción automatizados e control avanzado de procesos	AJ2	BJ1 BJ3 BJ4	CJ1 CJ2 CJ5
Coñecementos para proxectar, calcular e deseñar sistemas integrados de fabricación	AJ3	BJ6 BJ7 BJ14 BJ15	CJ6 CJ7 CJ11

Contents	
Topic	Sub-topic
Os capítulos e temas seguintes desenvolven os contidos establecidos na ficha da Memoria de Verificación.	Sistemas de fabricación. Planificación e deseño na fabricación. Fabricación asistida por computador e sistemas de fabricación integrados. Deseño e ensaio de máquinas e produtos. Selección de procesos.
1. Deseño de produtos e selección de procesos	Visión estratéxica Información da fabricación para o deseño. Técnicas de deseño para fabricación e ensamblaxe Estratexia de selección de procesos. Selección de procesos
2. Fabricación aditiva e prototipado rápido.	Estereolitografía (SLA) Modelado por deposición fundida (FDM) Impresión tridimensional (3DP) Sinterizado selectivo por láser (SLS) Fabricación de obxectos laminados (LOM) Fabricación directa (LMD)
3. Procesos avanzados de mecanizado	Mecanizado ou corte con láser Procesos con descarga eléctrica ou electroerosión Procesos de corte con arco eléctrico Mecanizado por ultrasóns Corte con chorro de auga e chorro abrasivo Mecanizado electroquímico Mecanizado químico



4. Automatización dos procesos de fabricación	Introdución á automatización. Sistemas de control industriais. Control numérico. Robótica industrial.
5. Fabricación asistida por ordenador e sistemas de fabricación integrados	Diseño asistido por ordenador. Fabricación asistida por ordenador. Introducción a CIM (Computer Integrated Manufacturing)

Planning				
Methodologies / tests	Competencies / Results	Teaching hours (in-person & virtual)	Student's personal work hours	Total hours
Laboratory practice	A2 A3	15	7.5	22.5
Guest lecture / keynote speech	A2 A3 B1 B3 B4 B15 B14 B7 B6	20	20	40
Supervised projects	A2 A3 B1 B3 B4 B15 B14 B7 B6 C1 C2 C5 C6 C7 C11	0	40.5	40.5
Objective test	A2 A3	4	1.5	5.5
Personalized attention		4	0	4

(*The information in the planning table is for guidance only and does not take into account the heterogeneity of the students.

Methodologies	
Methodologies	Description
Laboratory practice	Sesión de prácticas de laboratorio.
Guest lecture / keynote speech	Clases de teoría nas que se desenrolan os contidos da materia.
Supervised projects	Realización de traballos bibliográficos, teóricos, numéricos e/o prácticos
Objective test	Proba escrita utilizada para a avaliación da aprendizaxe

Personalized attention	
Methodologies	Description
Laboratory practice Supervised projects	<p>Alumnado con dedicación completa:</p> <p>a) Prácticas de laboratorio: Resolución de dúbidas durante a realización das sesións de prácticas.</p> <p>b) Traballos tutelados: Seguimento do traballo do alumno durante o desenvolvemento dos traballos tutelados propostos.</p> <p>Alumnado a tempo parcial:</p> <p>a) Prácticas de laboratorio: Resolución de dúbidas durante a realización das sesións de prácticas.</p> <p>b) Traballos tutelados: Seguimento do traballo do alumno durante o desenvolvemento dos traballos tutelados propostos.</p>

Assessment



Methodologies	Competencies / Results	Description	Qualification
Objective test	A2 A3	A proba obxectiva consiste na superación dun exame final que engloba todos os contidos vistos ao longo do curso	30
Supervised projects	A2 A3 B1 B3 B4 B15 B14 B7 B6 C1 C2 C5 C6 C7 C11	Traballos realizados polo alumno.	70

Assessment comments

A realización fraudulenta das probas ou actividades de avaliación implicará directamente a cualificación de suspenso '0' na materia na convocatoria correspondente, invalidando así calquera cualificación obtida en todas as actividades de avaliación para a seguinte convocatoria.

1. PRIMEIRA OPORTUNIDADE:

A. Alumnado con dedicación completa:

asistencia/ participación nas actividades de clase mínima do 75% (clases de teoría) e 100% (prácticas de laboratorio):

a) Traballos tutelados: elaboración dos traballos indicados(70%)

b) Proba obxectiva: exame final (30%)

B. Alumnado con recoñecemento de dedicación a tempo parcial e dispensa académica de exención de asistencia:

asistencia/ participación nas actividades de clase mínima do 50 % (clases de teoría) e 100% (prácticas de laboratorio):

a) Traballos tutelados: elaboración dos traballos indicados (70%)

b) Proba obxectiva: exame final (30%)

2. SEGUNDA OPORTUNIDADE E CONVOCATORIA ADIANTADA:

a) Traballos tutelados: elaboración dos traballos indicados (70%)

b) Proba obxectiva: exame final (30%)

Sources of information

Basic	<ul style="list-style-type: none"> - K. G. Cooper (2001). Rapid Prototyping Technology. Marcel Dekker - Ali K. Kamrani (2010). Engineering Design and Rapid Prototyping. Springer - Frank W. Liou (2007). Rapid Prototyping and Engineering Applications. CRC Press - Beno Benhabib (2001). Manufacturing Design, Production, Automation and Integration. Marcel Dekker - K. G. Swift (2003). Process Selection. Butterworth Heinemann - M. P. Groover (2015). Automation, Production Systems, and Computer-Integrated Manufacturing. Pearson - S. Kalpakjian (2009). Manufacturing Engineering and Technology. Pearson - O. Diegel (2020). A Practical Guide to Design for Additive Manufacturing. Springer - G. Hötter (2016). Additive Manufacturing. Hanser
Complementary	

Recommendations

Subjects that it is recommended to have taken before

Subjects that are recommended to be taken simultaneously

Subjects that continue the syllabus

Other comments

(*)The teaching guide is the document in which the URV publishes the information about all its courses. It is a public document and cannot be modified. Only in exceptional cases can it be revised by the competent agent or duly revised so that it is in line with current legislation.