



Teaching Guide				
Identifying Data				2020/21
Subject (*)	Polymer Processing		Code	730497230
Study programme	Mestrado Universitario en Enxeñaría Industrial (plan 2018)			
Descriptors				
Cycle	Period	Year	Type	Credits
Official Master's Degree	2nd four-month period	Second	Optional	4.5
Language	Spanish			
Teaching method	Face-to-face			
Prerequisites				
Department	Enxeñaría Naval e Industrial			
Coordinador	Artiaga Díaz, Ramon Pedro		E-mail	ramon.artiaga@udc.es
Lecturers	Artiaga Díaz, Ramon Pedro		E-mail	ramon.artiaga@udc.es
	López Beceiro, Jorge José			jorge.lopez.beceiro@udc.es
Web				
General description	Abordase o estudo dos procesos de transformación industrial dos materiais poliméricos.			



Contingency plan	1. Modifications in the contents. The content is not modified. 2. Methodologies * Teaching methodologies that are maintained Master session (through teams) Tutored works (tutored by teams or email) Objective test (online) * Teaching methodologies that change Laboratory practice. It is replaced by the presentation of practical cases in the master sessions and the reading and discussion of scientific articles (analysis of documentary sources). 3. Mechanisms for personalized attention to students. - E-mail: every day. Useful for making queries, requesting virtual meetings to resolve doubts and following up on supervised work. - Microsoft Teams: personalized student tutoring - Moodle: will be used as a repository for documentation provided to students. 1. Modificaciones en los contenidos 2. Metodologías *Metodologías docentes que se mantienen *Metodologías docentes que se modifican 3. Mecanismos de atención personalizada al alumnado 4. Modificacines en la evaluación *Observaciones de evaluación: 5. Modificaciones de la bibliografía o webgrafía 4. Modifications in the evaluation. Master session 10% - Continuous assessment through evaluation of active participation and with use. Mentored work 60% - Presentation of supervised work. Objective test 20% - Presentation of supervised work will be done orally. Analysis of documentary sources 10% - Reading and discussion of articles in scientific journals related to the firm * Evaluation observations: - 5. Modifications to the bibliography or webography
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No modifications



Study programme competences	
Code	Study programme competences
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.
B2	CB7 - That students know how to apply the knowledge acquired and their ability to solve problems in new or unfamiliar environments within broader (or multidisciplinary) contexts related to their area of study.
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.
B5	CB10 - That students have the learning skills that allow them to continue studying in a way that will be largely self-directed or autonomous.
B6	G1 - Have adequate knowledge of the scientific and technological aspects in Industrial Engineering.
B13	G8 - Apply the knowledge acquired and solve problems in new or unfamiliar environments within broader and multidisciplinary contexts.
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.
B16	G11 - Possess the learning skills that allow to continue studying in a self-directed or autonomous 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.
C3	ABET (c) - An ability to design a system, component, or process to meet desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufacturability, and sustainability.
C6	ABET (f) - An understanding of professional and ethical responsibility.
C7	ABET (g) - An ability to communicate effectively.
C8	ABET (h) - The broad education necessary to understand the impact of engineering solutions in a global, economic, environmental, and societal context.
C9	ABET (i) - A recognition of the need for, and an ability to engage in life-long learning.
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	
Coñecer os parámetros clave para o procesado de polímeros.	BJ1	CJ1
	BJ2	CJ2
	BJ3	CJ3
	BJ5	CJ6
	BJ6	CJ7
	BJ13	CJ11
	BJ14	
Coñecer as técnicas do procesado de polímeros.	BJ1	CJ1
	BJ4	CJ7
	BJ13	CJ8
	BJ15	CJ9
	BJ16	

Contents	
Topic	Sub-topic



Chaves para o procesado de polímeros: características térmicas e reolóxicas.	Propiedades térmicas e reolóxicas. Influencia da temperatura e as transformacións térmicas no comportamento reolóxico.
Transformación de termoplásticos	Transición vítrea, fusión e cristalización. Fenómenos de relaxación. Moldeo por inxección Extrusión Soplado e termoconformado. Moldeo rotacional
Transformación de termoestables	Curado Diagramas TTT Moldeo por compresión e transferencia Moldeo de termoestables reforzados Moldeo por inxección-reacción
Cauchos e termoelastómeros	Caucho natural e cauchos relacionados (SBR, CR, IIR,...) EPDM Termoelastómeros Plastificantes y plastisoles Calandrado

Planning				
Methodologies / tests	Competencies	Ordinary class hours	Student's personal work hours	Total hours
Guest lecture / keynote speech	B1 B3 B5 B14 B16 B6 C6 C8 C9	14	28	42
Laboratory practice	B2 B3 B4 B13 C1 C2 C3 C11	6	6	12
Mixed objective/subjective test	B1 B2 B3 B4 B13 B15 B14 B6 C1 C6 C7 C8 C9	2	4	6
Supervised projects	B1 B2 B3 B4 B5 B13 B15 B14 B16 B6 C1 C2 C3 C6 C7 C8 C9 C11	8	40	48
Personalized attention		4.5	0	4.5
(*)The information in the planning table is for guidance only and does not take into account the heterogeneity of the students.				

Methodologies	
Methodologies	Description
Guest lecture / keynote speech	Exposición oral complementada co uso de medios audiovisuales e a introdución dalgunhas preguntas dirixidas aos estudantes, coa finalidade de transmitir coñecementos e facilitar a aprendizaxe
Laboratory practice	Metodoloxía que permite que os estudantes aprendan efectivamente a través da realización de actividades de carácter práctico, tales como demostracións, exercicios, experimentos e investigacións
Mixed objective/subjective test	Proba que integra preguntas tipo de probas de ensaio e preguntas tipo de probas obxectivas. En canto ás primeiras, recolle preguntas abertas de desenvolvemento, as segundas poden combinar preguntas de resposta múltiple, de ordenación, de resposta breve, de discriminación, de completar e de asociación.



Supervised projects	Metodoloxía deseñada para promover a aprendizaxe autónoma dos estudantes, baixo tutélaa do profesor e en escenarios variados (académicos e profesionais). Está referida prioritariamente á aprendizaxe do "como facer as cousas",. Constitúe unha opción baseada na asunción polos estudantes da responsabilidade pola súa propia aprendizaxe. Este sistema de ensino baséase en dous elementos básicos: a aprendizaxe independente dos estudantes e o seguimento desa aprendizaxe polo profesor tutor.
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Personalized attention	
Methodologies	Description
Guest lecture / keynote speech	Aclaración de dúbidas que xurdan despois das sesións maxistrais e fundamentalmente explicacións, comentarios, resolución de dúbidas que xurdan durante o desenvolvemento das clases.
Laboratory practice	
Supervised projects	Non se acepta dispensa académica.

Assessment			
Methodologies	Competencies	Description	Qualification
Laboratory practice	B2 B3 B4 B13 C1 C2 C3 C11	Prácticas de laboratorio.	10
Supervised projects	B1 B2 B3 B4 B5 B13 B15 B14 B16 B6 C1 C2 C3 C6 C7 C8 C9 C11	Traballos tutelados (individuais ou en grupo)	50
Mixed objective/subjective test	B1 B2 B3 B4 B13 B15 B14 B6 C1 C6 C7 C8 C9	Proba mixta (por escrito)	40

Assessment comments
Academic waiver is not accepted

Sources of information	
Basic	Apuntes e documentación facilitada na clase ou a través de Moodle ou a plataforma de Microsoft da UDC.
Complementary	1. Tadmor Z, Gogos CG. Principles of polymer processing. 2. ed. Hoboken: Wiley; 2006. 2. Agassant J-F. Polymer processing: principles and modeling. 2nd edition. Munich?: Cincinnati: Hanser Publishers?; Hanser Publications; 2017.1. Tadmor Z, Gogos CG. Principles of polymer processing. 2. ed. Hoboken: Wiley; 2006. 2. Agassant J-F. Polymer processing: principles and modeling. 2nd edition. Munich?: Cincinnati: Hanser Publishers?; Hanser Publications; 2017.

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



Para axudar a conseguir unha contorna inmediata sostida e cumprir co obxectivo da acción número 5: ?Docencia e investigación saudable e sustentable ambiental e social? do "Plan de Acción Green Campus

Ferrol": A entrega dos traballos documentais que se realicen nesta materia: ? Solicitaranse en formato virtual e/ou soporte informático ? Realizarase a través de Moodle, en formato dixital sen necesidade de imprimilos ? En caso de ser necesario realízalos en papel:- Non se empregarán plásticos - Realizaranse impresións a dobre cara. - Empregarase papel reciclado. - Evitarase a impresión de borradores.Débese de facer un uso sustentable dos recursos e a prevención de impactos negativos sobre o medio natural

(*)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.