Teaching Guide				
Identifying Data				2022/23
Subject (*)	Materials Engineering		Code	771G01004
Study programme	Grao en Enxeñaría de Deseño Industrial e Desenvolvemento do Produto			
Descriptors				
Cycle	Period	Year	Type	Credits
Graduate	2nd four-month period	Second	Obligatory	6
Language	Spanish			
Teaching method	Face-to-face			
Prerequisites				
Department	Enxeñaría Naval e Industrial			
Coordinador	Galan Díaz, Juan José	E-mail	juan.jose.galan@udc.es	
Lecturers	Galan Díaz, Juan José	E-mail	juan.jose.galan@udc.es	
Web				
General description	In this subject, the developments and processes of the main materials used in engineering are highlighted.			

Study programme competences / results	
Code	Study programme competences / results
A1	Aplicar o coñecemento das diferentes áreas involucradas no Plano Formativo.
A2	Capacidade de comprensión da dimensión social e histórica do Deseño Industrial, vehículo para a creatividade e a búsqueda de solucións novas e efectivas.
A3	Necesidade dunha aprendizaxe permanente e continua (Life-long learning), e especialmente orientada cara os avances e os novos produtos do mercado.
A4	Traballar de forma efectiva como individuo e como membro de equipos diversos e multidisciplinares.
A5	Identificar, formular e resolver problemas de enxeñaría.
A6	Formación amplia que posibilite a comprensión do impacto das solucións de enxeñaría nos contextos económico, medioambiental, social e global.
A7	Capacidade para deseño, redacción e dirección de proxectos, en todas as súas diversidades e fases.
A8	Capacidade de usar as técnicas, habilidades e ferramentas modernas para a práctica da enxeñaría.
A9	Capacidade para efectuar decisións técnicas tendo en conta as súas repercusións ou costes económicos, de contratación, de organización ou xestión de proxectos.
A10	Comprensión das responsabilidades éticas e sociais derivadas da súa actividade profesional.
B2	Aplicar un pensamento crítico, lóxico e creativo para cuestionar a realidade, buscar e propoñer solucións innovadoras a nivel formal, funcional e técnico.
B5	Resolver problemas de forma efectiva.
B6	Traballar de forma autónoma con iniciativa.
B9	Comunicarse de maneira efectiva nun entorno de traballo.
B10	Capacidade de organización e planificación.
B11	Capacidade de análise e síntese.
C7	Developing the ability to work in interdisciplinary or transdisciplinary teams in order to offer proposals that can contribute to a sustainable environmental, economic, political and social development.
C8	Valuing the importance of research, innovation and technological development for the socioeconomic and cultural progress of society.

Learning outcomes	
Learning outcomes	Study programme competences / results

	A1 A2 A3 A4 A5 A6 A7 A8 A9 A10	B2 B5 B6 B9 B10 B11	C7 C8

Contents	
Topic	**Sub-topic**
Topic 1: Materials Science Basics Review	Brief history of materials Fundamentals of Materials Science Material classification crystalline imperfections TTT diagrams processes and treatments in engineering
Topic 2:Composite materials and polymers	Definition and characteristics Interactions between matrix and reinforcement Matrix Types Polymerization
Topic 3:Bonding of materials	Bonding Techniques
Topic 4: Fracture mechanics	Mechanical failure Types of fractures Fatigue
Topic 5: Quality control in industry	Quality management in industry
Topic 6: Non destructive tests	Types of non-destructive tests
Tema 7: Materials selection	Material selection criteria

Planning				
Methodologies / tests	**Competencies / Results**	**Teaching hours (in-person & virtual)**	**Student?s personal work hours**	**Total hours**
Objective test	A1 A2 A10 A8 A9 B2 B9 B10	8	24	32
Guest lecture / keynote speech	A1 A2 A8 A9 B2	28	28	56
Laboratory practice	A1 A10 A8 A9 B9	21	21	42
Supervised projects	A1 A3 A4 A5 A10 A6 A7 A9 B2 B5 B6 B9 B10 B11 C7 C8	8	8	16
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**
Objective test	It will consist of both practical and theoretical questions.
Guest lecture / keynote speech	Exposición por parte del docente de la materia objeto de examen
Laboratory practice	Analysis and resolution of numerical problems related to real tests
Supervised projects	Individual or group work done by students

Personalized attention	
Methodologies	**Description**
Supervised projects	The teacher will be at the service of the student in the hours corresponding to tutoring as well by means of e-mail

Assessment			
Methodologies	**Competencies / Results**	**Description**	**Qualification**
Supervised projects	A1 A3 A4 A5 A10 A6 A7 A9 B2 B5 B6 B9 B10 B11 C7 C8	Individual or group work	20
Objective test	A1 A2 A10 A8 A9 B2 B9 B10	Exam with questions and problems	60
Guest lecture / keynote speech	A1 A2 A8 A9 B2	Teacher exposition	5
Laboratory practice	A1 A10 A8 A9 B9	Numerical resolution of exercises	15

Assessment comments
Students exempt from enrollment must do the same as the rest

Sources of information	
Basic	Montes J.M., Cuevas F.G. y Cintas J.Ciencia e ingeniería de los materiales Ed ParaninfoCallister, William D.Introducción a la ciencia e ingeniería de los materialesCiencia de los materiales / J. C. Anderson...[et al.]Ciencia de los materiales / J. C. Anderson...[et al.]Tsai, Stephen W.Diseño y análisis de materiales compuestos / Stephen W. Tsai, Antonio Miravete de MarcoSmith, William F.Fundamentos de la ciencia e ingeniería de materiales / William F. Smith, Javad Hashemi.Materiales compuestos / director de la obra: Antonio Miravete; coautores: E. Larrodé... [et.al.]Ashby, Michael F.Materiales para ingeniería / Michael F. Ashby, David R. H. Jones.Ensayos no destructivos para industria y construcciónFranco Gimeno, José Manuel; Martín Sanjosé, Jesús, (aut.)Prensas de la Universidad de Zaragoza1ª ed., 1ª imp.(10/1999)146 páginas; 24x17 cmIdiomas: EspañolISBN: 8477335222 ISBN-13: 9788477335221Encuadernación: RústicaIngeniería de materiales para industria y construcciónFranco Gimeno, José Manuel; Madre Sediles, María Antonieta; Martín Sanjosé, Jesús, (aut.)Mira Editores, S.A.1ª ed., 1ª imp.(01/2004)496 páginas; 24x17 cmIdiomas: EspañolISBN: 848465088X ISBN-13: 9788484650881Encuadernación: RústicaCONTROL DE CALIDAD EN FABRICACIÓN MECÁNICA 2ª ediciónGómez González, Sergio, (aut.)Cano Pina, S.L. Ediciones CEYSA2ª ed., 1ª imp.(09/2007)302 páginas; 30x21 cmIdiomas: EspañolISBN: 8486108934 ISBN-13: 9788486108939Encuadernación: Rústica
Complementary	

Recommendations
Subjects that it is recommended to have taken before
Foundations of Engineering Materials/771G01003
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.