Teaching Guide				
Identifying Data				2024/25
Subject (*)	Introduction to complex materials		Code	730495001
Study programme	Mestrado Universitario en Materiais Complexos: Análise Térmica e Reoloxía (plan 2012)			
Descriptors				
Cycle	Period	Year	Type	Credits
Official Master's Degree	2nd four-month period	First	Obligatory	3
Language	English			
Teaching method	Face-to-face			
Prerequisites				
Department	Química			
Coordinador	Señaris Rodriguez, Maria Antonia	E-mail	m.senaris.rodriguez@udc.es	
Lecturers	Castro Garcia, Socorro Señaris Rodriguez, Maria Antonia	E-mail	socorro.castro.garcia@udc.es m.senaris.rodriguez@udc.es	
Web				
General description	Introducción a los materiales complejos es una materia obligatoria de segundo cuatrimestre. Esta asignatura, de carácter claramente interdisciplinar, pretende dar una visión general de los materiales complejos y avanzados: metales, aleaciones, cerámicas, polímeros, híbridos orgánicos-inorgánicos, nanomateriales, cristales plásticos, cristales líquidos,etc. Introduction to complex materials is a compulsory subject of the Master 2nd four-month period. The aims of this interdisciplinary subject is to provide a general overview of the different types of complex and advanced materials: metals and alloys, ceramics, polymers, organic-inorganic hybrids, nanomaterials, plastic crystals, liquid crystals, etc.			

Study programme competences / results	
Code	Study programme competences / results
A2	Identify and evaluate the different types of complex materials
A5	Understanding the relationships between structure and properties of materials
B2	The students have the skill to apply their knowledge and their ability to solve problems in new or unfamiliar contexts within broader (or multidisciplinary) contexts related to their field of study
B4	That the students can communicate their conclusions and the knowledge and last reasons behind that conclusions to specialized and non specialized audience in a clear and unambiguous way
B8	Applying a critical, logical and creative way of thinking
B13	Analysis-oriented attitude
B14	Ability to find and manage the information
B17	Analyze and decompose processes
C2	Have a good command of spoken and writing expression and understanding of a foreign language.
C7	To assume as a professional and citizen the importance of learning throughout life.
C8	To assess the importance of research, innovation and technological development in the socio-economic and cultural progress of society.

Learning outcomes			
Learning outcomes	Study programme competences / results		
To know the structure and properties of complex materials	AR2 AR5	BR2 BR4 BR8 BR13 BR14 BR17	CR2 CR7 CR8

To understand structure-properties relationships	AR5	BR2 BR4 BR8 BR13 BR14 BR17	CR2 CR7 CR8

Contents	
Topic	**Sub-topic**
General overview of complex and advanced materials: - metals and alloys - ceramics - polymers - organic-inorganic hybrids - nanomaterials, - plastic crystals, liquid crystals, etc.	

Planning				
Methodologies / tests	**Competencies / Results**	**Teaching hours (in-person & virtual)**	**Student?s personal work hours**	**Total hours**
Supervised projects	A2 A5 B2 B4 B8 B13 B14 B17 C2 C7 C8	15	25	40
Objective test	A2 A5 B2 B4 B8 B13 B17 C2	2	0	2
Guest lecture / keynote speech	A2 A5 B8 B13 C2 C7 C8	12	20	32
Personalized attention		1	0	1
(*)The information in the planning table is for guidance only and does not take into account the heterogeneity of the students.				

Methodologies	
Methodologies	**Description**
Supervised projects	Activities whose purpose is that the students enlarge the study of the topics presented in each theme and consolidate their acquired knowledge and capabilities. These activities should aslo help the students learn and improve their capabilities in literature survey.
Objective test	Final exam, at the end of the course, that will help evaluation of the knowledge, competencies and global vision about materials acquired by the students.
Guest lecture / keynote speech	Presentation made by the teacher, on a schematic basis, focusing on the main topics of each theme and covering both theoretical and practical issues.

Personalized attention	
Methodologies	**Description**
Supervised projects Objective test Guest lecture / keynote speech	The personalized attention to students, also those with academic dispensation, understood as a support in the teaching-learning process, will take place in the hours of tutoring of the teacher and/or at the most convenient times for the students, by prior agreement with the teacher.

Assessment			
Methodologies	**Competencies / Results**	**Description**	**Qualification**

Supervised projects	A2 A5 B2 B4 B8 B13 B14 B17 C2 C7 C8	Presentation (oral and written) of the tutored work.	60
Objective test	A2 A5 B2 B4 B8 B13 B17 C2	Examination or objective test.	40

Assessment comments
The so-called "second chance" is understood as a new opportunity to take the mixed test. However, if necessary, the teaching staff may include a second part on aspects related to the supervised work. The percentages of the different contributions will be the same as in the "first opportunity". The teaching-learning process, including assessment, refers to one academic year (this implies that each year a new process begins, including all assessment activities and procedures). In the case of students with academic dispensation, in order to pass the subject they must, like their classmates, take both the objective test and the corresponding tutored work, which the teacher may adapt to better suit their particular circumstances, maintaining the percentages. IMPORTANT: All aspects related to ACADEMIC EXEMPTIONS, PERMANENCE and ACADEMIC FRAUD will be governed in accordance with the current academic regulations of the UDC.

Sources of information	
Basic	W.D. CALLISTER , D.G. Rethwish . Materials Science and Engineering, 8th Ed. John Wiely and Sons, New Jersey (2011)J.F.. SHACKELFORD . Introduction to Materials Science for Engineers,7th Ed. Prentice Hall, San Francisco (2009)W.D. CALLISTER , D.G. Rethwish . Materials Science and Engineering, 8th Ed. John Wiely and Sons, New Jersey (2011)J.F.. SHACKELFORD . Introduction to Materials Science for Engineers,7th Ed. Prentice Hall, San Francisco (2009)
Complementary	A.R. WEST (1992). Solid State Chemistry and its Applications. Chichester, John Wiley and SonsL.E. SMART, E.A. MOORE (2005). Solid State Chemistry. Boca Raton, Taylor and FrancisW.F. SMITH (1998). Fundamentos de la Ciencia e Ingeniería de Materiales . Madrid, McGraw-HillJ.C. ANDERSON (1990). Materials Science. Londres, Chapman and HallG. CAO (2004) Nanostructures and Nanomaterials. Imperial College Press, London

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
1. The delivery of thedocumentary works that are made in this matter:1.1. It will be requested in virtual format and/or computer support.1.2. It will be done through Moodle, in digital format without the need to print them.1.3. If it is done on paper- No plastic shall be used.- Double-sided printing will be used.- Recycled paper shall be used.- The printing of draftsshall be avoided.