



## IDENTIFYING DATA

### Materials chemistry

Subject	Materials chemistry			
Code	V11G200V01702			
Study programme	(*)Grao en Química			
Descriptors	ECTS Credits	Choose	Year	Quadmester
	6	Mandatory	4th	1st
Teaching language	Spanish Galician English			
Department				
Coordinator	Rodríguez Arguelles, María Carmen			
Lecturers	Pastoriza Santos, Isabel Rodríguez Arguelles, María Carmen			
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Web				
General description	"Machine translation into english of the original teaching guide" Structure, properties and application of the different types of materials. Characterization techniques and degradation processes will be also studied.			

## Competencies

Code	
C5	Demonstrate knowledge and understanding of essential facts, concepts, principles and theories: Characteristics of the different states of matter and the theories used to describe them
C8	Demonstrate knowledge and understanding of essential facts, concepts, principles and theories: main techniques for structural determination, including spectroscopy
C18	Demonstrate knowledge and understanding of essential facts, concepts, principles and theories: principles of electrochemistry
C19	Apply knowledge and understanding to solve basic problems of quantitative and qualitative nature
C20	Evaluate, interpret and synthesize data and chemical information
C23	Present oral and written scientific material and scientific arguments to a specialized audience
D1	Communicate orally and in writing in at least one of the official languages of the University
D3	Learn independently
D4	Search and manage information from different sources
D5	Use information and communication technologies and manage basic computer tools
D7	Apply theoretical knowledge in practice
D8	Teamwork
D9	Work independently
D12	Plan and manage time properly
D13	Make decisions
D14	Analyze and synthesize information and draw conclusions
D15	Evaluate critically and constructively the environment and oneself

## Learning outcomes

Expected results from this subject	Training and Learning Results	
Differentiate between *conductividade electric and *iónica. Distinguish the *semiconductores *intrínsecos of the *extrínsecos.	C5	D1
	C19	D7
	C20	D9
Differentiate go in the #cooperative magnetism and the no #cooperative.	C5	D1
	C19	D9
	C20	

#Analyze the characteristics of metals and *alixes through essays of traction and *compresión.	C5 C19 C20	D1 D7 D9
Recognize hard magnetic materials and *blandos to split of the his cycle of *histéresis	C5 C19 C20	D1 D9
Recognize the types of superconductivade and the relation with the naturaize of the material.	C5 C19 C20	D1 D9
Describe the *aplicacions of the optical but important #phenomenon.	C5 C19	D1 D9
Describe the optical properties of the metals and no metals	C5 C19	D1 D9
Explain the thermal but important properties of the material.	C5 C19 C20	D1 D9
Describe the properties of the different ceramic materials and *polímeros.	C5 C20	D1 D7 D9
#Analyze and describe the characteristics of the *alixes in function of the his *diagramas of phases	C5 C19 C20	D1 D7 D9 D12 D13 D14
Describe the basic processes stop the *obtención of the material.	C5 C20 C23	D1 D3 D4 D7 D8 D9 D13 D15
Describe the general characteristics of the material compounds.	C20 C23	D1 D3 D4 D5 D8 D12 D14 D15
Justify and enter the need of new materials and *nanomaterialais.	C20 C23	D1 D3 D4 D5 D8 D12 D14 D15
Board the basic techniques of study of the surfaces of the material.	C8 C23	D1 D3 D4 D5 D8 D12 D14 D15
#Analyze the *corrosión of metals and ceramic and the degradation of the *polímeros.	C18	D1 D8 D14

## Contents

Topic	
Subject 1. *Introducción	Historical perspective. Ranking of the material.
Subject 2. Properties of the material	Mechanics. Electric. Magnetic. @Óptico. Thermal
Subject 3. Metallic materials	General characteristics. *Estructura. Alloys. *Aplicacions
Subject 4. Ceramic materials	General characteristics. Structures. Properties. *Aplicacions

Subject 5. Materials *polímeros	Structures. Properties. Applications
Subject 6. Compound materials	General characteristics. Ranking. Material reinforced with: particles, fibres and structural compounds
Subject 7. Degradation of materials	*Oxidación Metallic and *pasivación. Methods of protection against it *corrosión. *Corrosión Of ceramic materials and *polímeros. Methods of *autoreparación
Subject 8. *Nanomaterials	*Nanociencia *y *nanotecnología. *Metodos Of preparation. Properties to wool *nanoescala.
Subject 9. Characterization of materials	*Microscopías Of vicinity and electronic, *espectroscopía *fotoelectrónica.

### Planning

	Class hours	Hours outside the classroom	Total hours
Master Session	26	45	71
Seminars	13	32	45
Short answer tests	4	30	34

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

### Methodologies

	Description
Master Session	The students in one only group will receive 26 hours of kinds *expositivas that will devote to the presentation of the fundamental aspects of each subject. Wool platform of *teledocencia used to provide the material related that subject
Seminars	*Plantearanse *cuestions And enabling problems understanding and *profundizar in the theoretical aspects presented in the *sesions *maxistrales. Besides the students presented subjects related with the subject.

### Personalized attention

#### Methodologies Description

Seminars	During all the teaching period the students will be able to consult all type of doubts related with the subject how in the tutorías
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### Assessment

	Description	Qualification	Training and Learning Results
Seminars	It will value the assistance, realisation and discussion of the *cuestions posed by the professor. Also the preparation and exhibition by part of the students of subjects related with the matter	40	C5 D1 C8 D3 C19 D4 C20 D5 C23 D7 D8 D9 D12 D13 D14 D15
Short answer tests	They will realise two short proofs. The first of them will suppose 36% of the final note whereas second will suppose 24% of the final note. To surpass the matter is necessary to reach a minimum of a 4 in each one of the short proofs.	60	C5 D1 C8 D7 C18 D12 C19 D13 C20

### Other comments on the Evaluation

It is compulsory the assistance to all the planned activities that comport evaluation. The participation in 20% of the activities of evaluation of the seminars along the \*cuatrimestre or in any of the short proofs of planned evaluation will involve the condition of no presented.

Evaluation of July: The students that do not surpass the matter at the end of the \*cuatrimestre will have to do a proof written \*q1\*ue consisted of two part that correspond with the evaluated in the two short proofs realised during the course. It will not be necessary to realise the part of the proofs \*cortacuya qualification was equal or upper to 4 on 10 keeping the qualification obtained. \*Estan. This proof will have a value of 60% and will substitute the results of the short proofs. The remaining elements of evaluation are not recoverable and the qualifications obtained added to the quoted proof whenever the qualification obtained was equal or upper to 4 on 10. In case to obtain a lower qualification will be this the one who appear like final qualification in the record.

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**Sources of information**

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Callister, W.D., Rethwisch, D.G., **Materials Science and Engineering**, Wiley,

Callister, W.D., Rethwisch, D.G., **Introducción a la Ciencia e Ingeniería de los Materiales**, Reverté (trad. 9<sup>ed</sup>),

Kirkland, A.I., Hutchison, J.L., **Nanocharacterisation**, RSC, Cambridge,

Levine, I.N., **Fisicoquímica**, McGraw-Hill / Interamericana de España, S. A.,

Smart, L.E. Moore, E.A., **Solid State Chemistry. An introduction**, Taylor & Francis, 4<sup>a</sup>ed,

Singh, S. C, Hoboken J., **Nanomaterials**, John Wiley & Sons,

Vollath, D., **Nanomaterials : an introduction to synthesis, properties and application**, Wiley-VCH,

West, A.R., **West, A.R.. Solid state chemistry and its applications**, John Wiley & Sons.,

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**Recommendations**

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**Subjects that are recommended to be taken simultaneously**

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Inorganic chemistry III/V11G200V01703

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**Subjects that it is recommended to have taken before**

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Physical chemistry III/V11G200V01603

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