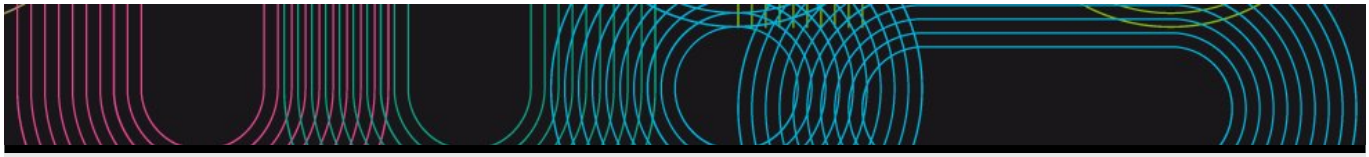

IDENTIFYING DATA				
Science and material engineering				
Subject	Science and material engineering			
Code	V12G760V01202			
Study programme	PCEO Grado en Ingeniería Biomédica/Grado en Ingeniería en Electrónica Industrial y Automática			
Descriptors	ECTS Credits	Choose	Year	Quadmester
	6	Mandatory	2nd	1st
Teaching language	Spanish			
Department				
Coordinator	Cristóbal Ortega, María Julia			
Lecturers	Álvarez González, David Cristóbal Ortega, María Julia Gomez Barreiro, Silvia			
E-mail	mortega@uvigo.es			
Web				
General description				

Training and Learning Results
Code

Expected results from this subject	
Expected results from this subject	Training and Learning Results

Contents	
Topic	
1. Introduction to the science and technology of the materials.	Introduction
2.- Crystalline organisation	Crystalline and amorphous solids. Crystalline networks, characteristic and imperfections. Transformations *alotrópicas.
3.- Superficial and massive properties	Mechanics, chemical, thermal, electrical and magnetic.
4.- Metallic materials	Solidification. Constitution of alloys. Size of grain. Main binary diagrams of balance. Processed. Alloys of basic iron: classification, applications and thermal treatments. Applications in *bioingeniería. Alloys no-*férreas: classification, applications and thermal treatments. Main alloys in *implantología.

5.- Material Plastics	Classification: Thermoplastic, thermostable and elastomers. Properties and methods of evaluation. Processes of conformed. Introduction to the biopolymers: properties and classification.
6.- Ceramic materials.	Classification and properties. Glasses and ceramic traditional. Ceramic technological. Introduction to the *biocerámicos (inert and *bioactivos)

Planning

	Class hours	Hours outside the classroom	Total hours
Introductory activities	1.5	0	1.5
Lecturing	31	55.8	86.8
Problem solving	1.25	3	4.25
Laboratory practical	18	18	36
Mentored work	0.5	6	6.5
Autonomous problem solving	0	12	12
Objective questions exam	1	0	1
Essay questions exam	1	0	1
Problem and/or exercise solving	0.95	0	0.95

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

Methodologies

	Description
Introductory activities	Presentation of the matter. Introduction to the science and technology of materials.
Lecturing	Exhibition by part of the professor of the contents on the matter object of study, theoretical bases and/or guidelines of a work, exercise that the/the student has to develop
Problem solving	Activity in which they formulate problem and/or exercises related with the subject. The student has to develop the suitable or correct solutions by means of the *ejercitación of routines, the application of formulas or algorithms, the application of procedures of transformation of the available information and the interpretation of the results. It is used to use as I complement of the lesson *magistral.
Laboratory practical	Activities of application of the knowledges to concrete situations and of acquisition of basic skills and *procedimentales related with the matter object of study. They develop in special spaces with skilled equipment (laboratories, computer classrooms, etc).
Mentored work	The/The student, of individual way or in group, elaborates a document on the thematic of the matter or prepares seminars, investigations, memories, essays, summaries of readings, conferences, etc.
Autonomous problem solving	Activity in which they formulate problems and/or exercises related with the subject (theoretical part and practical part). The student/to has to develop the analysis and resolution of the problems and/or exercises of autonomous form.

Personalized assistance

Methodologies	Description
Lecturing	The professor, in the schedule of *tutorías, will resolve the doubts that can have the student.
Problem solving	The professor, during the lesson *magistral, as well as in the schedule of *tutorías, will resolve the doubts that can have the student.
Laboratory practical	The professor, during the development of the practices of laboratory, will resolve the doubts that can have the student.
Mentored work	The professor, in the schedule of *tutorías, will resolve the doubts that can have the student.

Assessment

Description	Qualification	Training and Learning Results

Lecturing	It will make by means of two proofs written (problems, short questions and type test) that collect the knowledges purchased by the student along the course. The first proof will make during the period of teaching of the matter (roughly to half of the course) and will have a weight of 30%: the second proof (weight of 40%) will do in the date fixed by the centre.	70
Laboratory practical	The formative activities of practical character will evaluate according to the criteria of assistance, degree of participation and reports of development of the practices (5%) and a proof of evaluation at the end of the period of teaching of the practices (15%)	20
Mentored work	The work made in small groups will be evaluated through his public defence. Will take into account the information contributed, bibliography consulted, the structure of the contents, the clarity of the presentation and the answers contributed in the final debate with the professor and the rest of the students	10

Other comments on the Evaluation

Global evaluation:&*nbsp;&*nbsp;in
the two official editions the renunciation to the continuous evaluation and election of the system of global evaluation will make following the procedure and the term established by the centre. It will consist of an only examination written that will have a weight of 100% of the note and will evaluate all the theoretical and practical contents of the subject.

1º EDITION OF THE RECORD: Modality of Continuous Evaluation.&*nbsp;Will consist of distinct proofs made during the teaching of the subject and a final proof in the official date&*nbsp;previously fixed by the centre.&*nbsp;The final note of the first edition will be the sum of the notes obtained in the group of the proofs of evaluation.&*nbsp;

2º EDITION OF THE RECORD:&*nbsp;Modality of continuous Evaluation.&*nbsp;It will keep the note of the practical part of the evaluation&*nbsp;continuous&*nbsp;(practices of laboratory and work *tutelado)&*nbsp; and it will make &*nbsp;a final proof in the official date&*nbsp;previously fixed by the centre.

Extraordinary announcement:&*nbsp;it will make in the previously fixed date by the centre. It will consider the system&of *nbsp;global evaluation&*nbsp;and the examination written will cover the whole of the theoretical and practical contents that will suppose 100% of the note.

Ethical behaviour:&*nbsp;it expects that the present student a suitable ethical behaviour, attending especially to the indicated in the Articles 39, 40, 41 and 42 of the&*nbsp;Regulation on the evaluation, the qualification and the quality of the teaching and of the process of learning of the *estudiantado of the *Universidade of Vigo&*nbsp;(approved in the *claustro of 18 April 2023).

WARNING: In case of discrepancies between the distinct versions&*nbsp;linguistic&*nbsp;of the guide will prevail the indicated in the version in Spanish

Sources of information

Basic Bibliography

Callister, William D., **Materials Science and Engineering: an introduction.**, Wiley, 2009
Askeland, Donald R., **The science and engineering of materials**, Cengage Learning,, 2012
Shackelford, James F., **Introduction to materials science for engineers**, Prentice-Hall, 2010
Smith, William F., **Fundamentals of materials science and engineering.**, McGraw-Hill, 2010

Complementary Bibliography

María Vallet Regí, **BIOMATERIALES**, Consejo Superior de Investigaciones Científicas, 2013
Pío González Fernández, **Biomateriales: Diseño, producción y caracterización**, Rede Galega de Biomateriais, 2015

Recommendations

Subjects that continue the syllabus

Subjects that it is recommended to have taken before

Chemistry: chemistry/V12G420V01205