[GOO301] MATERIALS SCIENCE AND ENGINEERING

GENERAL INFORMATION

Studies	DEGREE IN INDUSTRIAL ORGANIZATION ENGINEERING			**Subject**	MATERIAL ENGINEERING AND SCIENCE
Semester	1	**Course**	2	**Mention / Field of specialisation**	
Character	COMPULSORY				
Plan	2022	**Modality**	Face-to-face	**Language**	EUSKARA/CASTELLANO
Credits	6	**Hours/week**	3.67	**Total hours**	66 class hours + 84 non-class hours = **150 total hours**

2030 AGENDA GOALS

PROFESSORS

SARRIONANDIA ARIZNABARRETA, MARIASUN
IBARRETXE LOPEZ, UNAI
GOMEZ SAGARZAZU, MIREN
URIBE AZKARRETA, MAITANE

REQUIRED PREVIOUS KNOWLEDGE

Subjects	Knowledge
CHEMISTRY	*(No previous knowledge required)*

LEARNING RESULTS

LEARNING RESULTS	KC	SK	AB	ECTS
GOR208 - To distinguish the different types of materials, understanding the fundamentals of science, technology and chemistry of materials, taking into account the relationship between the microstructure, synthesis or processing and the properties of the materials.		*x*		5,4
G-RTR1 - To develop interdisciplinary projects specific to their specialty and of gradual complexity, - becoming aware of respect for human rights and fundamental rights, and analyzing and assessing the impact of the proposed solutions on the SDGs - to acquire and/or apply basic, advanced and/or avant-garde, demonstrating the ability to work in multidisciplinary teams and/or undertake further studies with a high degree of autonomy		*x*		0,36
G-RTR2 - To express information, ideas and the arguments that support them in an orderly, clear and coherent manner, orally and in writing, based on quality information, self-made or obtained from different sources, using inclusive and non-discriminatory language		*x*		0,24
			Total:	6

KC: Knowledge or Content / SK: Skills / AB: Abilities

ENAEE LEARNING RESULTS	ECTS
ENAE01 - Knowledge and understanding: Knowledge and understanding of the underlying scientific and mathematical principles in their branch of engineering.	3,2
ENAE04 - Knowledge and understanding: To be aware of the multidisciplinary context of engineering.	0,4
ENAE05 - Analysis in engineering: Ability to apply their knowledge and understanding in identifying, formulating and solving engineering problems using established methods.	0,16
ENAE06 - Analysis in engineering: Ability to apply their knowledge and understanding in analysing product, process and method engineering.	0,32
ENAE08 - Engineering projects: Ability to apply their knowledge in the development and completion of projects which meet specific requirements.	0,32
ENAE12 - Research & innovation: Technical and lab competences.	0,32
ENAE14 - Practical application of engineering: Ability to combine theory and practice in order to solve engineering problems.	0,32
ENAE17 - Transversal competences: To work effectively, both individually and in a team.	0,32
ENAE18 - Transversal competences: To use different methods to communicate effectively with the engineering community and society in general.	0,32
ENAE19 - Transversal competences: Demonstrate that they are aware of the responsibility implied in the practical application of engineering, the social and environmental impact, and show commitment with professional ethics, responsibility and regulations of the practical application of engineering.	0,32
Total:	6

SECONDARY LEARNING RESULTS

1RGO291 **(1 sem)**

LEARNING ACTIVITIES	CH	NCH	TH
Carrying out/resolving projects/challenges/cases, etc. to provide solutions to problems in interdisciplinary contexts, real and/or simulated, individually and/or in teams	2 h.	1 h.	3 h.

EVALUATION SYSTEM	W	MAKE-UP MECHANISMS
Presentation and defence of exercises, case studies, computer practical work, simulation practical work, laboratory practical work, term projects, end of degree project, master's thesis, challenges and problems	100%	*(No mechanisms)*

CH - Class hours: 2 h.
NCH - Non-class hours: 1 h.
TH - Total hours: 3 h.

RGO218 **[!]** ***Calcula las dimensiones de elementos estructurales simples sometidos a cargas estáticas bajo criterios de rigidez y resistencia***

LEARNING ACTIVITIES	CH	NCH	TH
Conducting tests, giving presentations, presenting defences, taking examinations and/or doing checkpoints	2 h.		2 h.
Presentation by the teacher in the classroom, in participatory classes, of concepts and procedures associated with the subjects	14 h.	2 h.	16 h.
Carrying out exercises and solving problems individually and/or in teams	6 h.	11 h.	17 h.

EVALUATION SYSTEM	W	MAKE-UP MECHANISMS
Reports on the completion of exercises, case studies, computer exercises, simulation exercises, laboratory exercises, term projects, challenges and problems	20%	Individual written and/or oral tests or individual coding/programming tests
Individual written and/or oral tests or individual coding/programming tests	80%	

CH - Class hours: 22 h.
NCH - Non-class hours: 13 h.
TH - Total hours: 35 h.

1RGO292 **(1 sem)**

LEARNING ACTIVITIES	CH	NCH	TH
Carrying out/resolving projects/challenges/cases, etc. to provide solutions to problems in interdisciplinary contexts, real and/or simulated, individually and/or in teams	2 h.	1 h.	3 h.

EVALUATION SYSTEM	W	MAKE-UP MECHANISMS
Reports on the completion of exercises, case studies, computer exercises, simulation exercises, laboratory exercises, term projects, challenges and problems	100%	*(No mechanisms)*

CH - Class hours: 2 h.
NCH - Non-class hours: 1 h.
TH - Total hours: 3 h.

RGO217 **[!]** ***Selecciona los materiales más adecuados para poder fabricar el producto dentro de las especificaciones establecidas por el cliente***

LEARNING ACTIVITIES	CH	NCH	TH

Development and writing of records, reports, presentations, audiovisual material, etc. on projects/work experience/challenges/case studies/experimental investigations carried out individually and/or in teams	1 h.	15 h.	16 h.
Personal study and flexible development of concepts and subjects using active dynamics, to foster more meaningful learning	3 h.		3 h.
Presentation by the teacher in the classroom, in participatory classes, of concepts and procedures associated with the subjects	28 h.	36 h.	64 h.
Practical work in workshops and/or laboratories, individually and/or in teams	2 h.	15 h.	17 h.

EVALUATION SYSTEM	W	MAKE-UP MECHANISMS
Reports on the completion of exercises, case studies, computer exercises, simulation exercises, laboratory exercises, term projects, challenges and problems	20%	Individual written and/or oral tests or individual coding/programming tests
Presentation and defence of exercises, case studies, computer practical work, simulation practical work, laboratory practical work, term projects, end of degree project, master's thesis, challenges and problems	20%	
Individual written and/or oral tests or individual coding/programming tests	60%	

CH - Class hours: 34 h.
NCH - Non-class hours: 66 h.
TH - Total hours: 100 h.

1RGO290 (1 sem)

LEARNING ACTIVITIES	CH	NCH	TH
Carrying out/resolving projects/challenges/cases, etc. to provide solutions to problems in interdisciplinary contexts, real and/or simulated, individually and/or in teams	2 h.	1 h.	3 h.

EVALUATION SYSTEM	W	MAKE-UP MECHANISMS
Reports on the completion of exercises, case studies, computer exercises, simulation exercises, laboratory exercises, term projects, challenges and problems	100%	*(No mechanisms)*

CH - Class hours: 2 h.
NCH - Non-class hours: 1 h.
TH - Total hours: 3 h.

1RGO293 (1 sem)

LEARNING ACTIVITIES	CH	NCH	TH
Development and writing of records, reports, presentations, audiovisual material, etc. on projects/work experience/challenges/case studies/experimental investigations carried out individually and/or in teams	2 h.	1 h.	3 h.

EVALUATION SYSTEM	W	MAKE-UP MECHANISMS
Presentation and defence of exercises, case studies, computer practical work, simulation practical work, laboratory practical work, term projects, end of degree project, master's thesis, challenges and problems	100%	*(No mechanisms)*

CH - Class hours: 2 h.
NCH - Non-class hours: 1 h.
TH - Total hours: 3 h.

1RGO294 **(1 sem)**

LEARNING ACTIVITIES	CH	NCH	TH
Development and writing of records, reports, presentations, audiovisual material, etc. on projects/work experience/challenges/case studies/experimental investigations carried out individually and/or in teams	2 h.	1 h.	3 h.

EVALUATION SYSTEM	W
Presentation and defence of exercises, case studies, computer practical work, simulation practical work, laboratory practical work, term projects, end of degree project, master's thesis, challenges and problems	100%

MAKE-UP MECHANISMS

(No mechanisms)

CH - Class hours: 2 h.
NCH - Non-class hours: 1 h.
TH - Total hours: 3 h.

CONTENTS

Knowledge of materials:1.Metallic materials2. Ceramic materials3.Polymeric materials4.Composite materials Behavior of materials1.Mechanical characterization2.Behavior in serviceMechanics of materials1.Tension and deformation2.Tension and compression3.Shear4.Torsion5.Bending

LEARNING RESOURCES AND BIBLIOGRAPHY

Learning resources

[!] *Plataforma Moodle*
[!] *Artículos de carácter técnico*
[!] *Laboratorios*
[!] *Presentaciones en clase*
[!] *Consultas en páginas web relacionadas con el tema*
[!] *Transparencias de la asignatura*
[!] *Proyección de videos*

Bibliography

http://katalogoa.mondragon.edu/janium-bin/janium_login_opac_re_lnk.pl?grupo=ORGINDUSTRIAL21&ejecuta=60