

[GCJ303] MATERIAL ENGINEERING AND SELECTION

GENERAL INFORMATION

Studies	DEGREE IN ENGINEERING IN ECO-TECHNOLOGY IN INDUSTRIAL PROCESS		Subject	MATERIAL ENGINEERING	
Semester	2	Course	2	Mention / Field of specialisation	
Character	COMPULSORY		Language	EUSKARA	
Plan	2022	Modality	Face-to-face	Total hours	71 class hours + 79 non-class hours = 150 total hours
Credits	6	Hours/week	3.94		

2030 AGENDA GOALS



PROFESSORS

ESNAOLA ARRUTI, ARITZ

REQUIRED PREVIOUS KNOWLEDGE

Subjects	Knowledge
(No specific previous subjects required)	(No previous knowledge required)

LEARNING RESULTS

LEARNING RESULTS	KC	SK	AB	ECTS
GCR207 - To select the most appropriate material considering its behavior in service, degradation phenomena and environmental impact		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

SECONDARY LEARNING RESULTS

2RGC290 (2 sem)

LEARNING ACTIVITIES

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

CH NCH TH
3 h. 3 h.

EVALUATION SYSTEM

Self-assessment 50%
Co-assessment 50%

MAKE-UP MECHANISMS

(No mechanisms)

CH - Class hours: 0 h.
NCH - Non-class hours: 3 h.
TH - Total hours: 3 h.

2RGC294 (2 sem)

LEARNING ACTIVITIES

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

CH NCH TH
3 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: 0 h. NCH - Non-class hours: 3 h. TH - Total hours: 3 h.		

RGC222 [!] *Comprende los diferentes tipos de materiales y los fundamentos de los principales fenómenos de degradación que pueden experimentar los materiales en uso*

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		4 h.	4 h.	8 h.
Conducting tests, giving presentations, presenting defences, taking examinations and/or doing checkpoints		2 h.	2 h.	4 h.
Carrying out/resolving projects/challenges/cases, etc. to provide solutions to problems in interdisciplinary contexts, real and/or simulated, individually and/or in teams			11 h.	11 h.
Presentation by the teacher in the classroom, in participatory classes, of concepts and procedures associated with the subjects		20 h.	12 h.	32 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: 26 h.				
NCH - Non-class hours: 29 h.				
TH - Total hours: 55 h.				

RGC224 [!] *Analiza y selecciona métodos y sistemas de reutilización y reciclado de materiales*

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	8 h.	4 h.	12 h.
Conducting tests, giving presentations, presenting defences, taking examinations and/or doing checkpoints	2 h.	2 h.	4 h.
Carrying out/resolving projects/challenges/cases, etc. to provide solutions to problems in interdisciplinary contexts, real and/or simulated, individually and/or in teams		8 h.	8 h.
Presentation by the teacher in the classroom, in participatory classes, of concepts and procedures associated with the subjects	11 h.	5 h.	16 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: 21 h. NCH - Non-class hours: 19 h. TH - Total hours: 40 h.			

2RGC292 (2 sem)

LEARNING ACTIVITIES

Carrying out/resolving projects/challenges/cases, etc. to provide solutions to problems in interdisciplinary contexts, real and/or simulated, individually and/or in teams

CH

1 h.

NCH

2 h.

TH

3 h.

EVALUATION SYSTEM

Reports on the completion of exercises, case studies, computer exercises, simulation exercises, laboratory exercises, term projects, challenges and problems

W

100%

MAKE-UP MECHANISMS

(No mechanisms)

CH - Class hours: 1 h.

NCH - Non-class hours: 2 h.

TH - Total hours: 3 h.

2RGC293 (2 sem)

LEARNING ACTIVITIES

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

CH

NCH

3 h.

TH

3 h.

EVALUATION SYSTEM

Reports on the completion of exercises, case studies, computer exercises, simulation exercises, laboratory exercises, term projects, challenges and problems

W

100%

MAKE-UP MECHANISMS

(No mechanisms)

CH - Class hours: 0 h.

NCH - Non-class hours: 3 h.

TH - Total hours: 3 h.

2RGC291 (2 sem)

LEARNING ACTIVITIES

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

CH

NCH

3 h.

TH

3 h.

EVALUATION SYSTEM

Reports on the completion of exercises, case studies, computer exercises, simulation exercises, laboratory exercises, term projects, challenges and problems

W

100%

MAKE-UP MECHANISMS

(No mechanisms)

CH - Class hours: 0 h.

NCH - Non-class hours: 3 h.

TH - Total hours: 3 h.

RGC223 [!] *Conoce y aplica la metodología de selección de materiales, seleccionando los materiales teniendo en cuenta el comportamiento en servicio, procesabilidad e impacto medioambiental de los componentes*

LEARNING ACTIVITIES		CH	NCH	TH
Personal study and flexible development of concepts and subjects using active dynamics, to foster more meaningful learning		2 h.	2 h.	4 h.
Carrying out/resolving projects/challenges/cases, etc. to provide solutions to problems in interdisciplinary contexts, real and/or simulated, individually and/or in teams			8 h.	8 h.
Presentation by the teacher in the classroom, in participatory classes, of concepts and procedures associated with the subjects		17 h.	5 h.	22 h.
Carrying out exercises and solving problems individually and/or in teams		4 h.	2 h.	6 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: 23 h.				
NCH - Non-class hours: 17 h.				
TH - Total hours: 40 h.				

CONTENTS

1. Behavior in service1.1 Corrosion1.2 Wear1.3 Fracture, fatigue and creep1.4 Fracture mechanisms2. Non-ferrous metallic materials3. Materials selection methodology3.1 Performance indexes 3.2 CES4 Environment and recycling 4.1 Materials recycling4.2 Industrial recycling processes

LEARNING RESOURCES AND BIBLIOGRAPHY

Learning resources	Bibliography
[!] <i>Apuntes de la asignatura</i>	http://katalogoa.mondragon.edu/janium-bin/janium_login_opac_re_Ink.pl?grupo=EKOTEKNOLOGIA22&ejecuta=40&_ST
[!] <i>Artículos de carácter técnico</i>	
[!] <i>Plataforma Moodle</i>	http://katalogoa.mondragon.edu/janium-bin/janium_login_opac_re_Ink.pl?grupo=EKOTEKNOLOGIA41&ejecuta=20&_ST
[!] <i>Transparencias de la asignatura</i>	
[!] <i>Software específico de la titulación</i>	
[!] <i>Presentaciones en clase</i>	