

[GEC303] MATERIALS SCIENCE, TECHNOLOGY AND CHEMISTRY

GENERAL INFORMATION

Studies	DEGREE IN INDUSTRIAL ELECTRONICS ENGINEERING		Subject	MECHANICAL AND CHEMICAL ENGINEERING OF MATERIALS
Semester	1	Course	2	Mention / Field of specialisation
Character	COMPULSORY		Language	CASTELLANO/EUSKARA
Plan	2022	Modality	Face-to-face	Total hours [!] 126 class hours + 87 non-class hours = 213 total hours
Credits	4,5	Hours/week	7	

PROFESSORS

MATEOS HEIS, MODESTO
GARRAMIOLA ALDAY, FERNANDO

REQUIRED PREVIOUS KNOWLEDGE

Subjects	Knowledge
PHYSICS I PHYSICS II	(No previous knowledge required)

LEARNING RESULTS

LEARNING RESULTS	KC	SK	AB	ECTS
GER203 - To know and use the principles of material resistance		x		1,48
GER204 - To know the fundamentals of science, technology and chemistry of materials	x			2,54
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		0,24
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:				4,5

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

ENAAE LEARNING RESULTS

- ENA103** - Knowledge and comprehension: Awareness of the multidisciplinary context of engineering.
- ENA106** - Engineering projects: Ability to project, design and develop complex products (parts, components, finished products, etc.), processes and systems of their speciality, which meet the established requirements, including awareness of the social, health and safety, environmental, economic and industrial aspects, as well as selecting and applying appropriate project methods.
- ENA109** - Research and innovation: Ability to consult and apply codes of good practice and security in their speciality.
- ENA110** - Research and innovation: Capacity and ability to project and carry out experimental investigations, interpret results, and reach conclusions in their field of study.
- ENA113** - Practical application of engineering: Knowledge of application of materials, equipment and tools, engineering technology and processes, and their limitations in the field of their speciality.
- ENA118** - Preparation of judgements: Ability to manage complex technical or professional activities or projects of their speciality, taking responsibility for decision making.
- ENA119** - Communication and Teamwork: Ability to effectively communicate information, ideas, problems and solutions in the field of engineering and with society in general.
- ENA120** - Communication and Teamwork: Ability to operate effectively in domestic and international contexts, individually and as a team, and to cooperate with both engineers and people from other disciplines.

SECONDARY LEARNING RESULTS

RGE290 [!] *Proponer los objetivos y la planificación de un proyecto que le permita adquirir y/o reforzar los conocimientos de tecnologías propias de su especialidad,- que en ocasiones llegan a la vanguardia del conocimiento- y definir una estrategia de aprendiz*

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	1 h.	2 h.	3 h.

EVALUATION SYSTEM	W	MAKE-UP MECHANISMS
Observation (technical capacity, attitude and participation)	100%	Observation (technical capacity, attitude and participation) Comments: Continuous assessment

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

RGE291 [!] *Establecer las responsabilidades de los miembros del equipo utilizando técnicas adecuadas para fomentar la eficiencia del equipo para el desarrollo del proyecto en los plazos establecidos (compartir recursos, aportar ideas, habilidades comunicativas)*

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	1 h.	2 h.	3 h.

EVALUATION SYSTEM

Observation (technical capacity, attitude and participation) **W** 100%

MAKE-UP MECHANISMS

Observation (technical capacity, attitude and participation)

Comments: Continuous assessment

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

RGE293 [!] *Redacta y estructura correctamente la memoria del proyecto, haciendo un uso correcto, inclusivo y no discriminatorio del lenguaje. Para ello, busca y hace uso de las fuentes de información adecuadas.*

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.	2 h.	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

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

Comments: - Continuous assessment. - It may be asked to redo the document.

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

RGE294 [!] *Realiza una presentación oral del proyecto con argumentos elaborados por sí mismos y haciendo un uso correcto, inclusivo y no discriminatorio del lenguaje.*

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.	2 h.	3 h.

EVALUATION SYSTEM

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 **W** 100%

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

Comments: Continuous assessment.

CH - Class hours: 1 h.

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

RGE204 [!] *Identifica y analiza las solicitudes que soportan las estructuras o elementos estructurales para asegurar el comportamiento mecánico adecuado de estos.*

LEARNING ACTIVITIES

	<i>CH</i>	<i>NCH</i>	<i>TH</i>
Personal study and flexible development of concepts and subjects using active dynamics, to foster more meaningful learning	2 h.	10 h.	12 h.
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	10 h.	2 h.	12 h.
Carrying out work experience in real environments and writing the corresponding report	4 h.	7 h.	11 h.

EVALUATION SYSTEM

W

Reports on the completion of exercises, case studies, computer exercises, simulation exercises, laboratory exercises, term projects, challenges and problems	6%
Individual written and/or oral tests or individual coding/programming tests	85%
Prototype / Product	9%
Comments: - Control point: minimum grade 5. - PBL project grade: 30% product, 20% technical content of the report and 50% individual technical defense.	

MAKE-UP MECHANISMS

Individual written and/or oral tests or individual coding/programming tests
Prototype / Product
Comments: - Students with less than a 5 at the control point must retake the exam. - Final note of the control point: control point 25% and retake 75%. - In the project / PBL there will not be any retake of the individual defense.

CH - Class hours: 18 h.
NCH - Non-class hours: 19 h.
TH - Total hours: 37 h.

RGE205 [!] *Conoce las propiedades electromagnéticas de los materiales y las aplicaciones de la tecnología y química de materiales en máquinas eléctricas y sistemas de almacenamiento*

LEARNING ACTIVITIES

	<i>CH</i>	<i>NCH</i>	<i>TH</i>
Personal study and flexible development of concepts and subjects using active dynamics, to foster more meaningful learning	14 h.	10 h.	24 h.
Presentation by the teacher in the classroom, in participatory classes, of concepts and procedures associated with the subjects	20 h.		20 h.
Carrying out exercises and solving problems individually and/or in teams	4 h.	4,5 h.	8,5 h.
Carrying out work experience in real environments and writing the corresponding report	5 h.	6 h.	11 h.

EVALUATION SYSTEM

W

Reports on the completion of exercises, case studies, computer exercises, simulation exercises, laboratory exercises, term projects, challenges and problems	3%
Individual written and/or oral tests or individual coding/programming tests	92%
Prototype / Product	5%
Comments: - Control point: minimum grade 5. - PBL project grade: 30% product, 20% technical content of the report and 50% individual technical defense.	

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Individual written and/or oral tests or individual coding/programming tests
Prototype / Product
Comments: - Students with less than a 5 at the control point must retake the exam. - Final note of the control point: control point 25% and retake 75%. - In the project / PBL there will not be any retake of the individual defense.

CH - Class hours: 43 h.
NCH - Non-class hours: 20,5 h.
TH - Total hours: 63,5 h.

RGE204 [!] *Identifica y analiza las solicitudes que soportan las estructuras o elementos estructurales para asegurar el comportamiento mecánico adecuado de estos*

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CONTENTS

LEARNING RESOURCES AND BIBLIOGRAPHY

Learning resources

Bibliography

Moodle Platform
Subject notes

Young, Hugh D. Física universitaria [Sears y Zemansky] vol. 2 (Ed 12).Mexico: Pearson Educación. 2013. ISBN: 978-607-442-304-4
Mechanics of Materials, Roy R. Craig Jr., 3rd edition, 2011, ISBN 978-0-470-48181-3, John Wiley and Sons