

## [GFC012] ELECTROMAGNETISM I

### GENERAL INFORMATION

<b>Studies</b>	ENGINEERING PHYSICS APPLIED TO INDUSTRY	<b>Subject</b>	Physics
<b>Semester</b>	2	<b>Course</b>	2
<b>Character</b>	COMPULSORY	<b>Mention / Field of specialisation</b>	
<b>Plan</b>	2022	<b>Modality</b>	Face-to-face
<b>Credits</b>	3	<b>Hours/week</b>	0
		<b>Language</b>	CASTELLANO/EUSKARA
		<b>Total hours</b>	45 class hours + 30 non-class hours = <b>75 total hours</b>

### PROFESSORS

ALMANDOZ LARRALDE, GAIZKA

### REQUIRED PREVIOUS KNOWLEDGE

Subjects	Knowledge
GENERAL PHYSICS II	(No previous knowledge required)

### LEARNING RESULTS

LEARNING RESULTS	KC	SK	AB	ECTS
GFR123 - Solving electromagnetic field problems and knowing the properties of magnetic materials		x		2,7
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		0,16
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		0,14
<b>Total:</b>				<b>3</b>

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

### SECONDARY LEARNING RESULTS

**RGF290** [!] *Muestra las habilidades para trabajar en grupo y resuelve los problemas planteados utilizando las herramientas adecuadas en cada caso.*

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.		2 h.
<b>EVALUATION SYSTEM</b>	<b>W</b>	<b>MAKE-UP MECHANISMS</b>	
Self-assessment	25%	(No mechanisms)	
Co-assessment	25%		
Observation (technical capacity, attitude and participation)	50%		

CH - Class hours: 2 h.

NCH - Non-class hours: 0 h.

TH - Total hours: 2 h.

**RGF291** [!] *Utiliza la metodología adecuada para encontrar las soluciones a los problemas y para desarrollar los proyectos: Examina bien los problemas, y busca información significativa para hacerle frente y propone las soluciones.*

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.		2 h.
<b>EVALUATION SYSTEM</b>	<b>W</b>	<b>MAKE-UP MECHANISMS</b>	
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:** 0 h.  
**TH - Total hours:** 2 h.

**RGF292** [!] *Comunica, busca y estructura correctamente la información de manera escrita: Redacta una memoria de proyecto clara y concisa siguiendo los criterios establecidos en la guía para la redacción de la memoria de proyectos y utilizando herramienta informá*

**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.		2 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:** 2 h.  
**NCH - Non-class hours:** 0 h.  
**TH - Total hours:** 2 h.

**RGF293** [!] *Comunica, busca y estructura correctamente la información de manera oral: Realiza una presentación oral y defensa del proyecto clara y concisa, utilizando adecuadamente los aspectos recogidos en la guía de comunicación oral y las herramientas informá*

**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.	,5 h.	1,5 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**

(No mechanisms)

**CH - Class hours:** 1 h.  
**NCH - Non-class hours:** ,5 h.  
**TH - Total hours:** 1,5 h.

**RGF232** [!] *Plantea las formulaciones y las condiciones de contorno necesarias para resolver y analizar los campos electromagnéticos en condiciones estáticas*

**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	6 h.	4,5 h.	10,5 h.
Presentation by the teacher in the classroom, in participatory classes, of concepts and procedures associated with the subjects	15 h.	5 h.	20 h.
Carrying out exercises and solving problems individually and/or in teams	10 h.	8 h.	18 h.
Practical work in workshops and/or laboratories, individually and/or in teams		4 h.	4 h.

**EVALUATION SYSTEM**

Reports on the completion of exercises, case studies,

W

20%

**MAKE-UP MECHANISMS**

Individual written and/or oral tests or individual

computer exercises, simulation exercises, laboratory exercises, term projects, challenges and problems  
 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  
 Individual written and/or oral tests or individual coding/programming tests

20%

60%

coding/programming tests

**Comments:** 25% the first control point + 75% the recovery exam

**CH - Class hours:** 31 h.

**NCH - Non-class hours:** 21,5 h.

**TH - Total hours:** 52,5 h.

**RGF233** [!] *Conoce y comprende las propiedades de los materiales magnéticos y dieléctricos, además de sus aplicaciones*

**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.

2 h.

Computer simulation exercises, individually and/or in teams

2 h.

2 h.

Presentation by the teacher in the classroom, in participatory classes, of concepts and procedures associated with the subjects

3 h.

2 h.

5 h.

Carrying out exercises and solving problems individually and/or in teams

2 h.

4 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

**Comments:** 25% the first control point + 75% the recovery exam

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:** 7 h.

**NCH - Non-class hours:** 8 h.

**TH - Total hours:** 15 h.

**CONTENTS**

1. Formulations for the representation of magnetic fields
  - a. Maxwell's equations
  - b. Magnetostatic problems
  - c. Potential functions for the resolution of electromagnetic problems
  - d. Boundary conditions
2. Dielectric and magnetic materials, and their applications

**LEARNING RESOURCES AND BIBLIOGRAPHY**

**Learning resources**

(No resources)

**Bibliography**

<https://labur.eus/ddqZz>