

[GFI002] Experimental Techniques II

GENERAL INFORMATION

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

PROFESSORS

GALLEGO NAVAS, IVAN

REQUIRED PREVIOUS KNOWLEDGE

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

LEARNING RESULTS

LEARNING RESULTS	KC	SK	AB	ECTS
GFR119 - Carrying out experimental projects in the fields of classical and quantum physics		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
Total:				3

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.

EVALUATION SYSTEM

	W
Self-assessment	25%
Co-assessment	25%
Observation (technical capacity, attitude and participation)	50%

MAKE-UP MECHANISMS

(No mechanisms)

CH - Class hours: 0 h.

NCH - Non-class hours: 2 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.

EVALUATION SYSTEM

	W
Reports on the completion of exercises, case studies, computer exercises, simulation exercises, laboratory exercises, term projects, challenges and problems	100%

MAKE-UP MECHANISMS

(No mechanisms)

CH - Class hours: 0 h.

NCH - Non-class hours: 2 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: 0 h.

NCH - Non-class hours: 2 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		1,5 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: 0 h.

NCH - Non-class hours: 1,5 h.

TH - Total hours: 1,5 h.

RGF227 [!] *Desarrolla proyectos experimentales de termodinámica, modeliza fenómenos térmicos e interrelaciona los resultados experimentales con simulaciones asistidas por ordenador.*

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		7,5 h.	7,5 h.
Practical work in workshops and/or laboratories, individually and/or in teams	15 h.		15 h.

EVALUATION SYSTEM

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

W

35%

MAKE-UP MECHANISMS

(No mechanisms)

Presentation and defence of exercises, case studies, 45%
 computer practical work, simulation practical work,
 laboratory practical work, term projects, end of degree
 project, master's thesis, challenges and problems
 Observation (technical capacity, attitude and participation) 20%

CH - Class hours: 15 h.

NCH - Non-class hours: 7,5 h.

TH - Total hours: 22,5 h.

RGF228 [!] *Desarrolla proyectos experimentales de física cuántica, crea modelos físicos y los aplica para analizar resultados experimentales.*

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

7,5 h.

7,5 h.

Practical work in workshops and/or laboratories, individually and/or in teams

15 h.

15 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

35%

(No 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

45%

Observation (technical capacity, attitude and participation)

20%

CH - Class hours: 15 h.

NCH - Non-class hours: 7,5 h.

TH - Total hours: 22,5 h.

RGF229 [!] *Desarrolla proyectos experimentales de física eléctrica y electrónica, crea modelos físicos y los aplica para analizar resultados experimentales*

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

7,5 h.

7,5 h.

Practical work in workshops and/or laboratories, individually and/or in teams

15 h.

15 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

35%

(No 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

45%

Observation (technical capacity, attitude and participation)

20%

CH - Class hours: 15 h.

NCH - Non-class hours: 7,5 h.

TH - Total hours: 22,5 h.

CONTENTS

Electromagnetism Practices:

1. Magnetic Field Visualizers
2. Lorentz Force
3. Lenz's Law
4. Magnetic Induction Apparatus
5. Lorentz Motor
6. Generator-Motor
7. Determination of Earth's Magnetic Field
8. Induction in a Variable Magnetic Field
9. Electric Circuits
10. Transformer Laws

Thermodynamics Practices:

1. Determination of Air Density
2. Experiments in a Vacuum
3. Thermal Anomaly of Water
4. Specific Heat
5. Heat Pump
6. Energy Transformation
7. Ignition Piston
8. Thermal Expansion
9. Thermal Conduction

Quantum Physics Practices:

1. Spectroscopy
2. Digital Spectroscopy
3. Electron Deflection in Electric and Magnetic Fields
4. Stefan-Boltzmann Law
5. Photoelectric Effect (+Double-Slit Experiment)
6. Millikan Apparatus
7. Franck-Hertz Experiment
8. Electron Diffraction

Other Practices:

1. Fluids: Surface Tension, Archimedes's Principle, Pressure Losses
2. Vibrations and Waves

LEARNING RESOURCES AND BIBLIOGRAPHY

Learning resources

(No resources)

Bibliography

<https://labur.eus/LZvSb>