[GFI002] Experimental Techniques II

GENERAL INFORMATION

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

2030 AGENDA GOALS

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*		2,6
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*		0,24
			Total:	3

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

SECONDARY LEARNING RESULTS

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		6,5 h.	6,5 h.
Practical work in workshops and/or laboratories, individually and/or in teams	15 h.		15 h.

EVALUATION SYSTEM	W
Reports on the completion of exercises, case studies, computer exercises, simulation exercises, laboratory exercises, term projects, challenges and problems	35%
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%

MAKE-UP MECHANISMS

(No mechanisms)

CH - Class hours: 15 h.
NCH - Non-class hours: 6,5 h.
TH - Total hours: 21,5 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		6,5 h.	6,5 h.
Practical work in workshops and/or laboratories, individually and/or in teams	15 h.		15 h.

EVALUATION SYSTEM	W
Reports on the completion of exercises, case studies, computer exercises, simulation exercises, laboratory exercises, term projects, challenges and problems	35%
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%

MAKE-UP MECHANISMS
(No mechanisms)

CH - Class hours: 15 h.
NCH - Non-class hours: 6,5 h.
TH - Total hours: 21,5 h.

2RGF293 **(2 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.	2 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)
Comments: Continuous assessment. Retake is not foreseen.

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

2RGF294 **[!]** ***(2 sem)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
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
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)
Comments: Continuous assessment. Retake is not foreseen.

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

2RGF291 **(2 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.	2 h.

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

MAKE-UP MECHANISMS

(No mechanisms)

Comments: Continuous assessment. Retake is not foreseen.

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

2RGF290 **(2 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.	2 h.

EVALUATION SYSTEM	W
Reports on the completion of exercises, case studies, computer exercises, simulation exercises, laboratory exercises, term projects, challenges and problems	85%
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	15%

MAKE-UP MECHANISMS

(No mechanisms)

Comments: Continuous assessment. Retake is not foreseen.

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

2RGF292 **(2 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.	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)

Comments: Continuous assessment. Retake is not foreseen.

CH - Class hours: 0 h.
NCH - Non-class hours: 2 h.
TH - Total hours: 2 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		7 h.	7 h.

projects/work experience/challenges/case studies/experimental investigations carried out individually and/or in teams		
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 h.
TH - Total hours: 22 h.

CONTENTS

Quantum Physics Lab 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 oil drop experiment
7. Franck-Hertz experiment.
8. Electron diffraction.

Electromagnetism Lab Practices:

1. Magnetic field visualizers.
2. Lorentz force.
3. Lenz's Law.
4. Magnetic induction apparatus.
5. Lorentz motor.
6. Motor-generator set.
7. Determination of the Earth's magnetic field.
8. Induction in a time-varying magnetic field.
9. Electrical circuits.
10. Transformer laws.

Thermodynamics Lab Practices:

1. Determination of air density.
2. Vacuum experiments.
3. Thermal anomaly of water.
4. Specific heat.
5. Heat pump.
6. Energy transformation.
7. Fire piston.
8. Thermal expansion.
9. Thermal conduction.

Other Lab Practices:

1. Fluid mechanics: surface tension, Archimedes' Principle, and pressure drops.
2. Vibrations and waves.

LEARNING RESOURCES AND BIBLIOGRAPHY

Learning resources	Bibliography
(No resources)	https://labur.eus/LZvSb