

## [GJI202] MECHATRONIC SYSTEMS ASSEMBLY LABORATORY II

### GENERAL INFORMATION

<b>Studies</b>	DEGREE IN MECHATRONICS ENGINEERING		<b>Subject</b>	?
<b>Semester</b>	2	<b>Course</b>	2	
<b>Character</b>	OPTIONAL		<b>Mention / Field of specialisation</b>	
<b>Plan</b>	2022	<b>Modality</b>	Face-to-face	
<b>Credits</b>	4,5	<b>Hours/week</b>	3.75	
		<b>Language</b>	CASTELLANO/EUSKARA	
		<b>Total hours</b>	67.5 class hours + 45 non-class hours = <b>112.5 total hours</b>	

### PROFESSORS

ZARATE BARRIGA, SERGIO
ANZOLA GARCIA, JON
ARCE SAN VICENTE, JOSU
AZPI-VIGURI, MIGUEL ANGEL (SOMORROSTRO)

### REQUIRED PREVIOUS KNOWLEDGE

Subjects	Knowledge
BASIC INDUSTRIAL AUTOMATION	(No previous knowledge required)
ELECTRICAL POWER SYSTEMS	

### LEARNING RESULTS

LEARNING RESULTS	KC	SK	AB	ECTS
<b>GJR210</b> - To know and apply principles of installation of automated electrical systems and measurement of electrical variables	x			4,02
<b>G-RTR1</b> - 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
<b>G-RTR2</b> - 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
<b>Total:</b>				<b>4,5</b>

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

### SECONDARY LEARNING RESULTS

**RGJ290** [!] *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	2 h.	1 h.	3 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)	
		<b>Comments:</b> Continuous assessment. Retake is not foreseen.	

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

**RGJ291** [!] *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
Conducting tests, giving presentations, presenting defences, taking examinations and/or doing	2 h.	1 h.	3 h.

checkpoints

**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:** 2 h.

**NCH - Non-class hours:** 1 h.

**TH - Total hours:** 3 h.

**RGJ293** [!] *Redacta y estructura correctamente la memoria del proyecto, haciendo un uso correcto 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

2 h.

1 h.

3 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:** Revision and correction of the written report of the semester project

**CH - Class hours:** 2 h.

**NCH - Non-class hours:** 1 h.

**TH - Total hours:** 3 h.

**RGJ294** [!] *Realiza una presentación oral del proyecto argumentando de forma eficaz, y haciendo un uso correcto 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

2 h.

1 h.

3 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:** 2 h.

**NCH - Non-class hours:** 1 h.

**TH - Total hours:** 3 h.

**RGJ228** [!] *Realiza instalaciones de sistemas eléctricos automatizados, interpretando planos, esquemas y procedimientos.*

**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.

6 h.

14 h.

Personal study and flexible development of concepts and subjects using active dynamics, to foster more meaningful learning

2 h.

6 h.

8 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.

4 h.

12 h.

Seminars, debates and/or workshops to deepen and/or share experiences.

10 h.

6 h.

16 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	80%	Reports on the completion of exercises, case studies, 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	20%	<b>Comments:</b> The mark is calculated by the grade obtained from the results of the practical exercises. In case of need of recovery, final result: 25% grade obtained in practical exercises + 75% recovery grade.

**CH - Class hours:** 28 h.  
**NCH - Non-class hours:** 22 h.  
**TH - Total hours:** 50 h.

**RGJ229** [!] *Utiliza diferentes instrumentos para la verificación y medida de variables eléctricas*

<b>LEARNING ACTIVITIES</b>	<b>CH</b>	<b>NCH</b>	<b>TH</b>
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.	6 h.	14 h.
Presentation by the teacher in the classroom, in participatory classes, of concepts and procedures associated with the subjects	4 h.	2 h.	6 h.
Practical work in workshops and/or laboratories, individually and/or in teams	19,5 h.	11 h.	30,5 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	80%	Individual written and/or oral tests or individual coding/programming tests
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%	<b>Comments:</b> In case of need of recovery, final result: 25% grade obtained in practical exercises + 75% recovery grade.

**CH - Class hours:** 31,5 h.  
**NCH - Non-class hours:** 19 h.  
**TH - Total hours:** 50,5 h.

## CONTENTS

### INSTALLATION OF AUTOMATED ELECTRICAL SYSTEMS

- Interpretation of electrical plans (Software EPLAN)
- Wiring of automated electrical installations for different applications

### VERIFICATION TECHNIQUES AND MEASUREMENT OF MAGNITUDES IN ELECTRICAL/ELECTRONIC SYSTEMS

- Measuring instrumentation

## LEARNING RESOURCES AND BIBLIOGRAPHY

<b>Learning resources</b>	<b>Bibliography</b>
Moodle Platform	PALLAS, R. 2003. Sensores y acondicionadores de señal. Barcelona. Marcombo
Slides of the subject	LÁZARO, A.M. 1994. Problemas resueltos de instrumentación y medidas electrónicas. Madrid. Paraninfo.
Labs	CERDÁ, L.M. 2014. Instalaciones eléctricas y automatismos. Madrid. Paraninfo.
Class presentations	GISCHEL, B. 2016. EPLAN Electric P8 Reference Handbook. Hanser Gardner Publications
Lab practical training	<a href="http://katalogoa.mondragon.edu/janium-bin/janium_login_opac_re_Ink.pl?grupo=MECATRONICA22&amp;ejecuta=30&amp;_ST">http://katalogoa.mondragon.edu/janium-bin/janium_login_opac_re_Ink.pl?grupo=MECATRONICA22&amp;ejecuta=30&amp;_ST</a>