

## [GCZ303] ADVANCED INDUSTRIAL AUTOMATION

### GENERAL INFORMATION

<b>Studies</b>	DEGREE IN ENGINEERING IN ECO-TECHNOLOGY IN INDUSTRIAL PROCESS		<b>Subject</b>	?
<b>Semester</b>	2	<b>Course</b>	3	<b>Mention / Field of specialisation</b>
<b>Character</b>	COMPULSORY		<b>Language</b>	EUSKARA
<b>Plan</b>	2022	<b>Modality</b>	Face-to-face	<b>Total hours</b> 27.5 class hours + 47.5 non-class hours = <b>75 total hours</b>
<b>Credits</b>	3	<b>Hours/week</b>	1.53	

### 2030 AGENDA GOALS



### PROFESSORS

MITXELENA MARTIARENA, EKHI

### REQUIRED PREVIOUS KNOWLEDGE

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

### LEARNING RESULTS

LEARNING RESULTS	KC	SK	AB	ECTS
<b>GCR302</b> - Develops automation systems and control methods appropriate to the requirements and needs of users		x		2,56
<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		0,2
<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

**Total:** 3

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

### SECONDARY LEARNING RESULTS

#### 2RGC393 (2 sem)

#### LEARNING ACTIVITIES

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

CH

NCH

TH

3 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. The project is managed through the tutoring meetings and the meetings held with the experts, errors are corrected and the precise guidelines are given to overcome the project.

**CH - Class hours:** 0 h.

**NCH - Non-class hours:** 3 h.

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

#### RGC305 [!] Diseña, desarrolla y valida la programación avanzada de los PLCs y los HMI

#### 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.	4 h.	6 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.	8 h.
Computer simulation exercises, individually and/or in teams	17 h.	5 h.	22 h.
Presentation by the teacher in the classroom, in participatory classes, of concepts and procedures associated with the subjects	8,5 h.		8,5 h.

#### EVALUATION SYSTEM

*W*

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

30%

Individual written and/or oral tests or individual coding/programming tests

70%

**Comments:** For the realization of the average, a 3.5 must be equalled or surpassed in all concepts. A lower grade will block the final qualification.

#### MAKE-UP MECHANISMS

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

Individual written and/or oral tests or individual coding/programming tests

**Comments:** Classroom activities: the recovery will have a weight of 75%. PBL: continuous evaluation

**CH - Class hours:** 27,5 h.

**NCH - Non-class hours:** 17 h.

**TH - Total hours:** 44,5 h.

#### 2RGC394 (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

3 h.

3 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%

**Comments:** Assessment of the acquired transversal skills: Followed methodology to solve the project: team work, decision making methods, conflict management... Project management: definition of objectives, planning,... Written and oral communication

#### MAKE-UP MECHANISMS

*(No mechanisms)*

**Comments:** Continuous assessment. The project is managed through the tutoring meetings and the meetings held with the experts, errors are corrected and the precise guidelines are given to overcome the project.

**CH - Class hours:** 0 h.

**NCH - Non-class hours:** 3 h.

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

#### RGC307 [!] *Aplica la programación avanzada de los PLCs y los HMI en un entorno práctico*

#### 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

19,5 h.

19,5 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

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:** PBL: continuous evaluation

**CH - Class hours:** 0 h.

**NCH - Non-class hours:** 19,5 h.

**TH - Total hours:** 19,5 h.

### 2RGC391 (2 sem)

#### LEARNING ACTIVITIES

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

CH

NCH

TH

2 h.

2 h.

#### EVALUATION SYSTEM

W

Self-assessment

50%

Co-assessment

50%

**Comments:** Assessment of the acquired transversal skills:

Followed methodology to solve the project: team work, decision

making methods, conflict management... Project management:

definition of objectives, planning,... Written and oral communication

#### MAKE-UP MECHANISMS

(No mechanisms)

**Comments:** Continuous assessment. The project is managed

through the tutoring meetings and the meetings held with the

experts, errors are corrected and the precise guidelines are given to

overcome the project.

CH - Class hours: 0 h.

NCH - Non-class hours: 2 h.

TH - Total hours: 2 h.

### 2RGC390 (2 sem)

#### LEARNING ACTIVITIES

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

CH

NCH

TH

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%

**Comments:** Assessment of the acquired transversal skills:

Followed methodology to solve the project: team work, decision

making methods, conflict management... Project management:

definition of objectives, planning,... Written and oral communication

#### MAKE-UP MECHANISMS

(No mechanisms)

**Comments:** Continuous assessment. The project is managed

through the tutoring meetings and the meetings held with the

experts, errors are corrected and the precise guidelines are given to

overcome the project.

CH - Class hours: 0 h.

NCH - Non-class hours: 2 h.

TH - Total hours: 2 h.

### 2RGC392 (2 sem)

#### LEARNING ACTIVITIES

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

CH

NCH

TH

1 h.

1 h.

#### EVALUATION SYSTEM

W

Reports on the completion of exercises, case studies,

computer exercises, simulation exercises, laboratory

exercises, term projects, challenges and problems

100%

**Comments:** Assessment of the acquired transversal skills:

Followed methodology to solve the project: team work, decision

making methods, conflict management... Project management:

definition of objectives, planning,... Written and oral communication

#### MAKE-UP MECHANISMS

(No mechanisms)

**Comments:** Continuous assessment. The project is managed

through the tutoring meetings and the meetings held with the

experts, errors are corrected and the precise guidelines are given to

overcome the project.

**CH - Class hours:** 0 h.  
**NCH - Non-class hours:** 1 h.  
**TH - Total hours:** 1 h.

## CONTENTS

Grafcet methodology. Advanced PLC programming:- SFC programming.- Parameterizable FC.- Instance FB.- Global DB.- PID control. Advanced HMI programming:- Image management.- Warnings.- Reports and files.- Recipes.- User administration.- Scripts. Machine security.

## LEARNING RESOURCES AND BIBLIOGRAPHY

### Learning resources

- [!] *Apuntes de la asignatura*
- [!] *Software específico de la titulación*
- [!] *Plataforma Moodle*
- [!] *Realización de prácticas en laboratorio*

### Bibliography

[https://katalogoa.mondragon.edu/janium-bin/janium\\_login\\_opac.pl?find&ficha\\_no=151005](https://katalogoa.mondragon.edu/janium-bin/janium_login_opac.pl?find&ficha_no=151005)