

[GJD202] MICROPROCESSORS

GENERAL INFORMATION

Studies	DEGREE IN MECHATRONICS ENGINEERING		Subject	?	
Semester	2	Course	3	Mention / Field of specialisation	
Character	OPTIONAL	Modality	Face-to-face	Language	CASTELLANO/EUSKARA
Plan	2022	Hours/week	2.58	Total hours	46.5 class hours + 66 non-class hours = 112.5 total hours
Credits	4,5				

PROFESSORS

MUXIKA OLASAGASTI, EÑAUT

 AZPI-DIEZ GARCIA, MIKEL (SOMORROSTRO)

REQUIRED PREVIOUS KNOWLEDGE

Subjects	Knowledge
FOUNDATIONS OF ELECTRICAL ENGINEERING	(No previous knowledge required)

LEARNING RESULTS

LEARNING RESULTS	KC	SK	AB	ECTS
GJR310 - System logiko programgarriak ezartzea, aurretiazko diseinua eta horien simulationazioak			x	4,02
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		0,24
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:				4,5

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

SECONDARY LEARNING RESULTS

RGJ390 [!] *Definir y gestionar los objetivos y la planificación de un proyecto que le permita adquirir y/o reforzar los conocimientos de tecnologías específicas de su especialidad,- que en ocasiones llegan a la vanguardia del conocimiento- y definir una estrate*

LEARNING ACTIVITIES

Carrying out/resolving projects/challenges/cases, etc. to provide solutions to problems in interdisciplinary contexts, real and/or simulated, individually and/or in teams

CH	NCH	TH
1 h.	2 h.	3 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)
Comments: Continuous assessment. Retake is not foreseen.

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

RGJ391 [!] *Coordinar el equipo de trabajo, estimulando la cohesión y buen clima para lograr la integración de todas las personas y su contribución para alcanzar un rendimiento apropiado, tanto a nivel individual como grupal, para el desarrollo del proyecto en*

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.	2 h.	3 h.

EVALUATION SYSTEM

Reports on the completion of exercises, case studies,

W
100%

MAKE-UP MECHANISMS

(No mechanisms)

computer exercises, simulation exercises, laboratory exercises, term projects, challenges and problems

Comments: Continuous assessment. Retake is not foreseen.

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

RGJ393 [!] *Elabora la memoria del proyecto, aportando argumentos elaborados y haciendo un uso correcto, incluso y no discriminatorio 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

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

RGJ394 [!] *Realiza una presentación oral del proyecto, justificando las soluciones propuestas con argumentos elaborados y precisos, y haciendo un uso correcto, incluso y no discriminatorio 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

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

RGJ3326 [!] *Realiza el esquema electrónico de un sistema lógico basado en microprocesador.*

LEARNING ACTIVITIES

CH **NCH** **TH**

Conducting tests, giving presentations, presenting defences, taking examinations and/or doing checkpoints

2 h. 2 h. 4 h.

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

5 h. 5 h. 10 h.

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

5 h. 7 h. 12 h.

EVALUATION SYSTEM

W

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

100%

MAKE-UP MECHANISMS

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

Comments: Exercises and practices are mandatory before taking the individual tests

CH - Class hours: 12 h.

NCH - Non-class hours: 14 h.

TH - Total hours: 26 h.

RGJ3327 [!] *Selecciona un microprocesador/microcontrolador para una aplicación concreta.*

LEARNING ACTIVITIES	CH	NCH	TH
Conducting tests, giving presentations, presenting defences, taking examinations and/or doing checkpoints	1 h.	2 h.	3 h.
Presentation by the teacher in the classroom, in participatory classes, of concepts and procedures associated with the subjects	4 h.	5 h.	9 h.
Carrying out exercises and solving problems individually and/or in teams	4 h.	6 h.	10 h.

EVALUATION SYSTEM	W	MAKE-UP MECHANISMS
Individual written and/or oral tests or individual coding/programming tests	100%	Individual written and/or oral tests or individual coding/programming tests

Comments: Exercises and practices are mandatory before taking the individual tests

CH - Class hours: 9 h.

NCH - Non-class hours: 13 h.

TH - Total hours: 22 h.

RGJ3328 [!] *Realiza el desarrollo SW completo de una aplicación basada en microprocesador, diagnosticando y corrigiendo*

LEARNING ACTIVITIES	CH	NCH	TH
Conducting tests, giving presentations, presenting defences, taking examinations and/or doing checkpoints	2 h.	4 h.	6 h.
Presentation by the teacher in the classroom, in participatory classes, of concepts and procedures associated with the subjects	7 h.	10 h.	17 h.
Carrying out exercises and solving problems individually and/or in teams	12,5 h.	17 h.	29,5 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	50%	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	50%	Individual written and/or oral tests or individual coding/programming tests

Comments: Exercises and practices are mandatory before taking the individual tests

CH - Class hours: 21,5 h.

NCH - Non-class hours: 31 h.

TH - Total hours: 52,5 h.

CONTENTS

1. Concepts and foundations
 - 1.1 What is a microcontroller?
 - 1.2 Microcontroller families
 - 1.3 Microcontroller applications
2. Microcontroller boards
 - 2.1 Components and design requirements
 - 2.2 Circuit design and interconnections
 - 2.3 Circuit interpretation and analysis
3. Architecture of microcontrollers
 - 3.1 Architecture of microcontrollers

- 3.2 Execution sequence (Pipeline)
- 3.3 Peripherals and memory map
- 4. Time sequencing
 - 4.1 Purpose of timers in a microcontroller
 - 4.2 Clock System
 - 4.3 Timers
 - 4.4 ARM Cortex M family internal timer (Systick)
 - 4.5 Manufacturer specific timers
- 5. Interruptions and exceptions
- 6. Other peripherals

LEARNING RESOURCES AND BIBLIOGRAPHY

Learning resources

Specific Master Software
Computer practical training
Slides of the subject
Moodle Platform

Bibliography

http://katalogoa.mondragon.edu/janium-bin/janium_login_opac_re_in_k.pl?grupo=MECATRONICA31&ejecuta=55&_ST