Goi Eskola Politeknikoa | Mondragon Unibertsitatea
Course: 2025 / 2026 - Course planning

Mondragon Unibertsitatea
Goi Eskola Politeknikoa
Escuela Politécnica Superior

[GJD302] OP S2. MICROPROCESSORS

GENERAL INFORMATION

Studies	DEGREE IN MECHATRONICS ENGINEERING		**Subject**	?	
Semester	2	**Course** 3	**Mention / Field of specialisation**		
Character	OPTIONAL				
Plan	2025	**Modality** Face-to-face	**Language**	CASTELLANO/EUSKARA	
Credits	4,5	**Hours/week** 3.36	**Total hours**	60.5 class hours + 52 non-class hours = **112.5 total hours**	

2030 AGENDA GOALS

SDG 8 DECENT WORK AND ECONOMIC GROWTH
SDG 9 INDUSTRY, INNOVATION AND INFRASTRUCTURE
SDG 12 RESPONSIBLE CONSUMPTION AND PRODUCTION

PROFESSORS

MUXIKA OLASAGASTI, EÑAUT

AZPI-ALVAREZ CAMACHO, PAOLA (SOMORROSTRO)

REQUIRED PREVIOUS KNOWLEDGE

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

LEARNING RESULTS

LEARNING RESULTS	KC	SK	AB	ECTS
GJR320 - System logiko programgarriak ezartzea, aurretiazko diseinua eta horien simulationazioak			x	3,78
G-TR1 - 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		0,4
G-TR2 - 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		0,32
			Total:	4,5

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

SECONDARY LEARNING RESULTS

RGJ3326 **They prepare the electronic schematic of a microprocessor-based logic system**

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	9 h.		9 h.
Carrying out exercises and solving problems individually and/or in teams	6,5 h.	4,5 h.	11 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

CH - Class hours: 17,5 h.
NCH - Non-class hours: 6,5 h.
TH - Total hours: 24 h.

2RGJ392 **(2 sem) Identify and accurately discuss the SDGs that the project addresses, suggesting possible actions for improvement.**

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	1 h.	2 h.	3 h.

individually and/or in teams

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

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

2RGJ390 (2 sem) Define and manage the objectives and planning of a project that allows you to acquire and/or reinforce your knowledge of technologies—sometimes reaching the cutting edge of knowledge—and define an effective self-learning strategy.

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.	2,5 h.	4 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	100%	Reports on the completion of exercises, case studies, computer exercises, simulation exercises, laboratory exercises, term projects, challenges and problems

CH - Class hours: 1,5 h.
NCH - Non-class hours: 2,5 h.
TH - Total hours: 4 h.

RGJ3328 They carry out the complete SW development of a microprocessor based application, diagnosing and correcting

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	6,5 h.	9,5 h.	16 h.
Carrying out exercises and solving problems individually and/or in teams	16 h.	12,5 h.	28,5 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

CH - Class hours: 24,5 h.
NCH - Non-class hours: 26 h.
TH - Total hours: 50,5 h.

2RGJ393 (2 sem)Prepare the project report, providing detailed arguments and using language that is correct, inclusive, and non-discriminatory.

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.	2,5 h.	4 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	100%	Reports on the completion of exercises, case studies, computer exercises, simulation exercises, laboratory exercises, term projects, challenges and problems

CH - Class hours: 1,5 h.
NCH - Non-class hours: 2,5 h.
TH - Total hours: 4 h.

RGJ3327 **They select a microprocessor/microcontroller for a specific application**

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	4,5 h.	3,5 h.	8 h.
Carrying out exercises and solving problems individually and/or in teams	6,5 h.	2,5 h.	9 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

CH - Class hours: 12 h.
NCH - Non-class hours: 8 h.
TH - Total hours: 20 h.

2RGJ391 **(2 sem) Coordinate the work team, encouraging cohesion and a positive atmosphere to achieve the integration of all individuals and their contribution to achieving appropriate performance, both individually and as a group, for the development o(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	1 h.	2 h.	3 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	100%	Reports on the completion of exercises, case studies, computer exercises, simulation exercises, laboratory exercises, term projects, challenges and problems

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

2RGJ394 **(2 sem) Give an oral presentation of the project, justifying the proposed solutions with detailed and precise arguments, and using language that is correct, inclusive, and non-discriminatory.**

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.	2,5 h.	4 h.

EVALUATION SYSTEM	W	MAKE-UP MECHANISMS
Reports on the completion of exercises, case studies, computer exercises, simulation exercises, laboratory	100%	Reports on the completion of exercises, case studies, computer exercises, simulation exercises, laboratory exercises, term

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exercises, term projects, challenges and problems	projects, challenges and problems

CH - Class hours: 1,5 h.
NCH - Non-class hours: 2,5 h.
TH - Total hours: 4 h.

CONTENTS

1. Concepts and fundamentals 1.1 What is a microcontroller? 1.2 Microcontroller families 1.3 Microcontroller applications2. Microcontroller boards 2.1 Components and design requirements 2.2 Circuit design and interconnections 2.3 Circuit interpretation and analysis3. Microcontroller architecture and operation 3.1 Microcontroller architecture   3.2 Execution sequence (pipeline)   3.3 Peripherals and memory map4. Timing sequencing   4.1 Purpose of timers in a microcontroller   4.2 Clock system   4.3 Timers   4.4 Internal timer of the ARM Cortex M family (Systick)   4.5 Manufacturer-specific timers5. Interrupts and exceptions6. Other peripherals

LEARNING RESOURCES AND BIBLIOGRAPHY

Learning resources	Bibliography
Specific Master Software	http://katalogoa.mondragon.edu/janium-bin/janium_login_opac_re_lnk.pl?grupo=MECATRONICA31&ejecuta=55&_ST
Computer practical training	
Slides of the subject	
Moodle Platform	