

[MRD101] ANALYSIS OF SUSTAINABLE DIGITAL CONTROL SYSTEMS

GENERAL INFORMATION

Studies	Master's Degree in ROBOTICS AND CONTROL SYSTEMS		Subject	?
Semester	1	Course	1	Mention / Field of specialisation
Character	OPTIONAL		Language	ENGLISH
Plan	2023	Modality	Face-to-face	Total hours [!] 23 class hours + 42 non-class hours = 65 total hours
Credits	3	Hours/week	0	

PROFESSORS

MUXIKA OLASAGASTI, EÑAUT

REQUIRED PREVIOUS KNOWLEDGE

Subjects	Knowledge
ELECTRONIC TECHNOLOGY BASIC INDUSTRIAL AUTOMATION MICROPROCESSORS	(No previous knowledge required)

LEARNING RESULTS

LEARNING RESULTS	KC	SK	AB	ECTS
M1R214 - Build a tailored device for the control of a process or autonomous system			x	1,8
M1R223 - Ability to work in multidisciplinary teams and in a multilingual environment and to communicate, both orally and in writing, knowledge, procedures, results and ideas related to subjects related to the Master's degree		x		0,2
M1R224 - To be able to do their job in cooperative, participatory environments, with awareness of social responsibility.		x		0,6
Total:				2,6

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

SECONDARY LEARNING RESULTS

[RA151] [!] *Evalúa y elige sistemas digitales de control para procesos industriales y sistemas autónomos cooperando para obtener la propuesta de manera participativa y analizando su sostenibilidad*

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.	7 h.	10 h.
Presentation by the teacher in the classroom, in participatory classes, of concepts and procedures associated with the subjects	4 h.	1 h.	5 h.
Reading and personal and/or shared analysis of relevant and current publications (books, articles, catalogues, etc.) related to the speciality	5 h.	10 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	50%
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	50%

Comments:

MAKE-UP MECHANISMS

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

Comments: All activities (control points, individual and group work, etc.) must have a minimum grade of 5 and an opportunity for recovery (except the PBL). If a control point is not passed (less than a 5), the retake is mandatory and the final grade will be the grade obtained in the retake. If an individual or group work is not passed (less than 5), the retake is mandatory and the final grade will be a maximum of 5. In the activities carried out it is necessary to obtain a minimum mark of 4 to calculate the average mark of the learning result. Otherwise, the note of the learning result will be that of the suspended activity. The system will calculate the final grade with the RA, applying the percentages defined in IKOF.

CH - Class hours: 12 h.
NCH - Non-class hours: 18 h.
TH - Total hours: 30 h.

RA152 [!] *Diseña y valida un sistema de control digital a medida trabajando individualmente y en equipos multidisciplinares y asegurando su capacidad para adaptarse a situaciones donde se requieran nuevos conocimientos que se han de aprender*

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.	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	5 h.	10 h.	15 h.
Presentation by the teacher in the classroom, in participatory classes, of concepts and procedures associated with the subjects	1 h.	3 h.	4 h.
Reading and personal and/or shared analysis of relevant and current publications (books, articles, catalogues, etc.) related to the speciality	3 h.	5 h.	8 h.

EVALUATION SYSTEM

W

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

50%

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:

MAKE-UP MECHANISMS

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

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CH - Class hours: 11 h.

NCH - Non-class hours: 24 h.

TH - Total hours: 35 h.

CONTENTS

1. Introduction
2. Managing the development of control systems
 - 2.1 Alternatives in the development of control systems
 - 2.2 Budget estimation
3. Analysing the impact of control system design
 - 3.1 An introduction to the analysis of the impacts of digital control systems
 - 3.2 Life Cycle Analysis: A quantitative approach for environmental impact assessment
4. Case Studies
 - 4.1 Manufacturing process control systems
 - 4.2 Autonomous systems

LEARNING RESOURCES AND BIBLIOGRAPHY

Learning resources

Topic related web quires
 Slides of the subject
 Technical articles
 Moodle Platform
 Class presentations

Bibliography

http://katalogoa.mondragon.edu/janium-bin/janium_login_opac_re_in_k.pl?grupo=MASTERROBOTIKA11&ejecuta=20&_ST