

[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	CASTELLANO/EUSKARA
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 - [!] <i>Construir un dispositivo a medida para el control de un proceso o de un sistema autónomo</i>			x	1,8
M1R223 - [!] <i>Capacidad de trabajar en equipos multidisciplinares y en un entorno multilingüe y de comunicar, tanto de forma oral como escrita, conocimientos, procedimientos, resultados e ideas relacionadas con los temas afines al máster</i>		x		0,2
M1R224 - [!] <i>Capacidad para ejercer su profesión con actitud cooperativa y participativa, y con responsabilidad social</i>		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%

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). In unapproved training activities (less than 5) the recovery is compulsory and the final grade will be the grade obtained in the recovery. 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	50%
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). In unapproved training activities (less than 5) the recovery is compulsory and the final grade will be the grade obtained in the recovery. 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.	

MAKE-UP MECHANISMS

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

Comments: All assessment activities (control points, individual and group assignments, etc...) must have a minimum grade of 5 and there will be an extra opportunity for those who do not pass in the first try (except for the PBL project). In all activities with a grade less than 5 resits are mandatory and the final grade will be the resit grade. In the assessment activities, it is necessary to obtain a minimum grade of 4 to calculate the average grade of the learning outcome. Otherwise, the learning outcome grade will be the grade of the failed activity.

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