[MHA201] INDUSTRIAL AUTOMATION

GENERAL INFORMATION

Studies	UNIVERSITY MASTER IN INDUSTRIAL ENGINEERING			**Subject**	?
Semester	1	**Course**	1	**Mention / Field of specialisation**	
Character	COMPULSORY				
Plan	2022	**Modality**	Face-to-face	**Language**	CASTELLANO
Credits	4,5	**Hours/week**	2.78	**Total hours**	50 class hours + 62.5 non-class hours = **112.5 total hours**

2030 AGENDA GOALS

3 GOOD HEALTH AND WELL-BEING / 8 DECENT WORK AND ECONOMIC GROWTH / 9 INDUSTRY, INNOVATION AND INFRASTRUCTURE / 12 RESPONSIBLE CONSUMPTION AND PRODUCTION

PROFESSORS

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- ORUNA OTALORA, ANGEL
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- 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
MHRA02 - To project, calculate and design integrated manufacturing systems		x		0,72
MHRA08 - To design and project automated production systems and advanced process control		x		3,2
MHRA28 - To communicate your conclusions and the knowledge and ultimate reasons that support them to specialized and non-specialized audiences in a clear and unambiguous way		x		0,16
MHRA30 - To work with people, involving and directing them in a dynamic aimed at a common objective that includes reflection on their ethical and social responsibility, with a global vision of the work to be carried out and the characteristics that it requires (quality, deadlines,...), assuming responsibility for the decisions made		x		0,16
MHR126 - To apply the knowledge acquired and your problem-solving skills in new, little-known or changing environments within broader (or multidisciplinary) contexts related to your area of study		x		0,26
			Total:	**4,5**

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

ENAEE LEARNING RESULTS	ECTS
ENA124 - Knowledge and comprehension: Deep knowledge and comprehension of the engineering disciplines of their speciality, at the level necessary to acquire the rest of the competencies of the degree.	0,5
ENA125 - Knowledge and comprehension: Critical Possession of avant-garde knowledge of their speciality.	0,5
ENA127 - Analysis in engineering: Ability to analyse new and complex engineering products, processes and systems within a broader multidisciplinary context; select and apply the most appropriate analysis, calculation and experimental methods already established, as well as innovative methods; and critically interpret the results of such analyses.	0,5
ENA129 - Analysis in engineering: Ability to identify, formulate and solve engineering problems defined incompletely, and/or with conflicts, which accept different valid solutions and require considering knowledge beyond those of their discipline and take into account the social, health and security, environmental, economic and industrial implications; to select and apply the most appropriate methods of analysis, calculation and experimental, as well as the most innovative methods for solving problems.	0,5
ENA132 - Engineering projects: Ability to project while applying the knowledge and cutting-edge understanding of their engineering speciality.	0,5
ENA137 - Research and innovation: Ability to investigate the application of the most advanced technologies in their speciality.	0,5
ENA140 - Practical application of engineering: Complete knowledge of application of materials, equipment and tools, engineering technology and processes, and their limitations.	0,5
ENA146 - Communication and Teamwork: Ability to employ different methods to communicate their conclusions, clearly and unambiguously, and the knowledge and logical foundations that support them, to audiences specialised and not specialised in the issue, in domestic and international contexts.	0,5
ENA147 - Communication and Teamwork: Ability to operate effectively in domestic contexts as a member or leader of a team, which may be composed of people of different disciplines and levels, and who can use virtual communication tools.	0,5
Total:	**4,5**

SECONDARY LEARNING RESULTS

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RMH163 [!] *Evalúa el riesgo según la norma ISO 12.100, realiza el estudio, define e implementa la solución técnica requerida según la norma EN ISO 13.849-1 relativa a la seguridad de las máquinas*

LEARNING ACTIVITIES	CH	NCH	TH
Conducting tests, giving presentations, presenting defences, taking examinations and/or doing checkpoints	1 h.		1 h.
Presentation by the teacher in the classroom, in participatory classes, of concepts and procedures associated with the subjects	5 h.	3 h.	8 h.
Practical work in workshops and/or laboratories, individually and/or in teams	3 h.	11 h.	14 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%	Individual written and/or oral tests or individual coding/programming tests
Individual written and/or oral tests or individual coding/programming tests	50%	

CH - Class hours: 9 h.
NCH - Non-class hours: 14 h.
TH - Total hours: 23 h.

RMH161 [!] *Diseña el algoritmo, desarrolla el programa de PLC que cumpla el estándar IEC-61131-3, valida y realiza la puesta en marcha mediante Gemelo Digital, integrando la conectividad de un sistema automático*

LEARNING ACTIVITIES	CH	NCH	TH
Conducting tests, giving presentations, presenting defences, taking examinations and/or doing checkpoints	2 h.		2 h.
Computer simulation exercises, individually and/or in teams	4 h.	19,5 h.	23,5 h.
Presentation by the teacher in the classroom, in participatory classes, of concepts and procedures associated with the subjects	25 h.	16 h.	41 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%	Individual written and/or oral tests or individual coding/programming tests
Individual written and/or oral tests or individual coding/programming tests	50%	

CH - Class hours: 31 h.
NCH - Non-class hours: 35,5 h.
TH - Total hours: 66,5 h.

RMH162 [!] *Diseña, desarrolla y valida los Interfaces hombre-máquina (SCADA) e Historizadores para aplicaciones MES que cumplan con los requisitos especificados, tanto a nivel local como en sistemas basados en buses de campo*

LEARNING ACTIVITIES	CH	NCH	TH
Conducting tests, giving presentations, presenting defences, taking examinations and/or doing checkpoints	1 h.	1 h.	2 h.
Computer simulation exercises, individually and/or in teams	3 h.	8 h.	11 h.
Presentation by the teacher in the classroom, in participatory classes, of concepts and procedures associated with the subjects	6 h.	4 h.	10 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%	Individual written and/or oral tests or individual coding/programming tests

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Individual written and/or oral tests or individual coding/programming tests	50%

CH - Class hours: 10 h.
NCH - Non-class hours: 13 h.
TH - Total hours: 23 h.

CONTENTS

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PLC programming- Treatment of numerical variables- Analog signals- Local and global data module (Data typ
e: Struct and UDT)- functions- InterruptionsHMI-HMI configuration-Programming of the graphical interface-
Alarms and data historization-Recipes and trends-User configurationIndustrial communications- TCP-IP arch
itecture- PROFINET- OPC-UAMachine safety- Directives and standards for machine safety (2006/42/CE, CE mar
king, UNE-EN ISO12.100, UNE-EN ISO 13849-1:2008)- Software handling (PL>=PLr konprobaketa)- Safety progra
mming
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LEARNING RESOURCES AND BIBLIOGRAPHY

Learning resources	Bibliography
Subject notes	Penín AR. Sistemas Scada-Guía Práctica. Marcombo; 2007
Topic related web quires	Pérez EM, Acevedo JM, Silva CF. Autómatas programables y sistemas de automatización. Marcombo; 2009
Moodle Platform	
Programmes	
Computer practical training	
Slides of the subject	