

[MRA003] INDUSTRIAL COMMUNICTIONS

GENERAL INFORMATION

Studies	Master's Degree in ROBOTICS AND CONTROL SYSTEMS		Subject	Automation	
Semester	2	Course	1	Mention / Field of specialisation	AUTOMATION
Character	OPTIONAL		Modality	Adapted Face-to-face	
Plan	2019	Hours/week	0	Language	CASTELLANO
Credits	3	Total hours	30 class hours + 45 non-class hours = 75 total hours		

PROFESSORS

FERNANDEZ ARRIETA, MIGUEL

REQUIRED PREVIOUS KNOWLEDGE

Subjects	Knowledge
(No specific previous subjects required)	(No previous knowledge required)

SKILLS

VERIFICA SKILLS

SPECIFIC

MRCE03 - Ability to select, design, project and implement efficient and secure communications infrastructures in industrial applications

CROSS

MRCTR1 - 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

BASIC

M_CB8 - To be able to integrate different types of knowledge and make complex judgements based on information that, in spite of being partial or limited, includes ideas on the social and ethical responsibilities associated with the application of knowledge

LEARNING RESULTS

RA031 The ability to identify the main technologies and protocols existing in industrial networks

LEARNING ACTIVITIES

	CH	NCH	TH
Presentation of the teacher in the classroom, in participatory classes, of concepts and procedures associated with the subjects	5 h.	7 h.	12 h.
Individual or team workshop and/or lab practice	7 h.	11 h.	18 h.

EVALUATION SYSTEM

	W
Individual written and oral tests to assess technical skills of the subject	40%
Reports of solving exercises, case studies, computer practices, simulation practices and laboratory practices	60%

MAKE-UP MECHANISMS

(No mechanisms)

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.

RA032 The ability to solve the problem of communication between equipments and applications of an industrial automation process, working individually and in multidisciplinary teams, analyzing its social and ethical impact

LEARNING ACTIVITIES

	CH	NCH	TH
Development, writing and presentation of memorandums, reports, audiovisual material, etc. Relating to projects/POPBLs carried out individually or in teams	2 h.	15 h.	17 h.

Presentation of the teacher in the classroom, in participatory classes, of concepts and procedures associated with the subjects	5 h.	3 h.	8 h.
Individual and team exercises	2 h.	2 h.	4 h.
Individual and/or team computer simulation practice	5 h.	5 h.	10 h.
Practices in real environments	4 h.	2 h.	6 h.
EVALUATION SYSTEM	W	MAKE-UP MECHANISMS	
Individual written and oral tests to assess technical skills of the subject	40%	Individual written and oral tests to assess technical skills of the subject	
Reports of solving exercises, case studies, computer practices, simulation practices and laboratory practices	50%	Technical skills, involvement in the project, finished work, obtained results, handed documentation, presentation and technical defence	
Technical skills, involvement in the project, finished work, obtained results, handed documentation, presentation and technical defence	10%	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: 18 h.			
NCH - Non-class hours: 27 h.			
TH - Total hours: 45 h.			

CONTENTS

1. Communications architecture. TCP/IP.
2. Industrial Ethernet. Fieldbuses
 1. PROFINET. POWERLINK. EtherCAT.
 2. Redundancy in industrial networks. MRP.
 3. Industrial WiFi.
3. Network integration. OPC-UA, MQTT, HTTP.
4. Cybersecurity in industrial networks.

LEARNING RESOURCES AND BIBLIOGRAPHY

Learning resources	Bibliography
Presentations by external Lecturers Labs Moodle Platform	(No bibliography)