Goi Eskola Politeknikoa Escuela Politécnica

		<u>G</u>	ENE <u>RAL IN</u>	FORMATION				
Studies	Master's Degre	e in ROBOTICS AND	CONTROL	Subject	?			
Semester	2 2	Course	1	Mention / Field of	AUTOMATION			
Character	OPTIONAL	Medality	Food to food	Jenguaga				
Pian Credite	2023	Hours/week		Language Total bours	59 class bours	+ 91 non-cl	ase hours	- 150 t
Credits	0	Hours/week	0	Total nours	hours	+ 91 11011-016	355 110015	) – <u>130 t</u>
			PROFE	SSORS				
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		REQUIF		OUS KNOWLED	GE			
	Sub	jects			Knowl	edge		
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			LEARNING	RESULTS				
ARNING RES	ULTS			late dia d		KC SK	AB	ECT
x203 - Apply m cified requirent	iuiti-axis drive so nents	iutions for synchroniz	ed and interpo	lated axis movement	s according to		x	5,2
R223 - Ability to	work in multidis writing, knowled	ciplinary teams and in ge, procedures, resul	n a multilingual ts and ideas re	environment and to lated to subjects rela	communicate, ted to the	x		0,2
R224 - To be a	ble to do their job	o in cooperative, parti	cipatory enviro	nments, with awaren	ess of social	x		0,2
R225 - Having and/or	and understandir r applying ideas,	ng knowledge providii often in a research co	ng a basis or o ontext.	pportunity to be origin	nal in	x		0,4
	11,2,0							
							Total:	6
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Knowledge or Co RA041 [!] Disc LEARNING AC Development a projects/work e ndividually and	ntent / SK: Skills / AE eña, desarrolla CTIVITIES und writing of rec experience/challe d/or in teams	3: Abilities SECON y valida el programa ords, reports, present nges/case studies/ex	NDARY LEA a de control de tations, audiovi perimental inve	RNING RESUL posición de un eje sual material, etc. on estigations carried ou	TS e mediante funct CH 5 h. t	iones estár NCH 9 h.	Total:	6 redefinio TH 4 h.
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Course: 2024 / 2025 - Course planning

final grade with the RA, applying the percentages defined in IKOF.

CH - Class hours: 14 h. NCH - Non-class hours: 26 h. TH - Total hours: 40 h.

<b>RA042</b> [1] Diseña, desarrolla y valida el programa de co predefinidas trabajando individualmente y en equipos m	ontrol de ultidiscip	sincronismo multi-ejes olinares	s utilizando :	funciones est	tándares
LEARNING ACTIVITIES			СН	NCH	тн
Development and writing of records, reports, presentations, projects/work experience/challenges/case studies/experime individually and/or in teams	, audiovis ental inves	ual material, etc. on stigations carried out	9 h.	10 h.	19 h.
Presentation by the teacher in the classroom, in participator procedures associated with the subjects	ry classes	s, of concepts and	10 h.	15 h.	25 h.
Practical work in workshops and/or laboratories, individually	/ and/or ir	n teams	1 h.	5 h.	6 h.
EVALUATION SYSTEM	W	MAKE-UP MECHANI	SMS		
Reports on the completion of exercises, case studies, computer exercises, simulation exercises, laboratory exercises, term projects, challenges and problems		Individual written and/ coding/programming to	or oral tests o ests	or individual	
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	20%				
Individual written and/or oral tests or individual coding/programming tests	80%				
<b>Comments:</b> Laboratory practices are mandatory to carry our evaluation of the PBL project. All activities (control points, inclu- and group work, etc.) must have a minimum grade of 5 and a opportunity for recovery (except the PBL). If a control point is passed (less than a 5), the retake is mandatory and the final will be the grade obtained in the retake. If an individual or gro- work is not passed (less than 5), the retake is mandatory and final grade will be a maximum of 5. In the activities carried our necessary to obtain a minimum mark of 4 to calculate the ave- mark of the learning result. Otherwise, the note of the learnin will be that of the suspended activity. The system will calcula final grade with the RA, applying the percentages defined in the	ut the dividual an s not grade oup d the erage g result te the IKOF.				
CH - Class hours: 20 h. NCH - Non-class hours: 30 h. TH - Total hours: 50 h.					

**RA043** [!] Diseña, desarrolla y valida el programa de control de interpolación de ejes lineal, circular, etc. utilizando las funciones estándares predefinidas buscando la originalidad de la propuesta y colaborando de manera activa para evaluar y asumir la respo

LEARNING ACTIVITIES			СН	NCH	тн
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			10 h.	10 h.	20 h.
Presentation by the teacher in the classroom, in participatory classes, of concepts and procedures associated with the subjects			10 h.	15 h.	25 h.
Practical work in workshops and/or laboratories, individually and/or in teams			5 h.	10 h.	15 h.
EVALUATION SYSTEM		MAKE-UP MECHANI	SMS		
Reports on the completion of exercises, case studies, computer exercises, simulation exercises, laboratory exercises, term projects, challenges and problems		Individual written and/ coding/programming to	or oral tests o ests	or individual	



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Course: 2024 / 2025 - Course planning

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

**Comments:** Laboratory practices are mandatory to carry out the evaluation of the PBL project. 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: 25 h. NCH - Non-class hours: 35 h. TH - Total hours: 60 h.

## CONTENTS

Introduction to Programmable Logic Controllers (PLC) for movement control

- Basic PLC operation (B&R)
- Usage and configuration of the development environment (Automation Studio)

Single axis manipulation

- Theoretical foundations and single axis configurations
- Diagnosis of single axis movement problems
- Analysis and validation of different types of movements

Multiple axes manipulation

- Synchronism and different types of synchronisations
- Configuration of synchronous axes
- Diagnosis of synchronous axes movement problems
- Analysis and validation of different types of movements of synchronous axes
- Analysis of the interpolation between axes

LEARNING RESOURCES AND BIBLIOGRAPHY				
Learning resources	Bibliography			
Moodle Platform	Brunner Hubert (2013). "Motion". Bernecler & Rainer			
Specific Master Software https://www.br-automation.com/en/academy/	Markus Ritchter (2013). "TA417TRN.433_ENG_CrossCutter". Bernecler & Rainer			
	Markus Ritchter (2013). "TA417TRN.433_ENG_Flying Saw". Bernecler & Rainer			
	Radak Alexander (2013). "TA417TRN.433-ENG_Labeller". Bernecler & Rainer			