Goi Eskola Politeknikoa Escuela Politécnica

	[GFE002] Electroni	cs and Autom	nation			
	GENERAL IN	FORMATION				
Studies ENGINEERING PH INDUSTRY	YSICS APPLIED TO	Subject	Industrial Electro	onics		
Semester 2 Character COMPULSORY	Course 2	Mention / Field of specialisation				
Plan 2022	Modality Face-to-face	Language	ENGLISH			
Credits 4,5	Hours/week 0	Total hours	66.5 class hours	s + 46 non-c	lass hour	s = <u>112.</u>
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NCH - Non-class hours: 21 h. TH - Total hours: 50 h.

2RGF293 (2 sem)					
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LEARNING ACTIVITIES			СН	NCH	ТН
Development and writing of records, reports, presentations projects/work experience/challenges/case studies/experim individually and/or in teams	s, audiovis iental inve	ual material, etc. on stigations carried out	2 h.		2 h.
EVALUATION SYSTEM	W	MAKE-UP MECHANI	SMS		
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	100%		(No mech	anisms)	
CH - Class hours: 2 h. NCH - Non-class hours: 0 h. TH - Total hours: 2 h.					
<b>2RGF294</b> [!] (2 sem)Realiza una presentación oral del correcto, inclusivo y no discriminatorio del lenguaje.	proyecto	con argumentos elabo	rados por si	í mismos y ha	nciendo un uso
LEARNING ACTIVITIES			СН	NCH	ТН
Carrying out/resolving projects/challenges/cases, etc. to p interdisciplinary contexts, real and/or simulated, individual	rovide solu ly and/or ir	itions to problems in teams	1 h.	1 h.	2 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	100%		(No mech	anisms)	
CH - Class hours: 1 h. NCH - Non-class hours: 1 h. TH - Total hours: 2 h.					

2RGF291 (2 sem)					
LEARNING ACTIVITIES			СН	NCH	тн
Carrying out/resolving projects/challenges/cases, etc. to p interdisciplinary contexts, real and/or simulated, individua EVALUATION SYSTEM	orovide sol Illy and/or i <i>W</i>	utions to problems in n teams MAKE-UP MECHAN	3 h.		3 h.
Reports on the completion of exercises, case studies, computer exercises, simulation exercises, laboratory exercises, term projects, challenges and problems	100%		(No mech	anisms)	
CH - Class hours: 3 h. NCH - Non-class hours: 0 h. TH - Total hours: 3 h.					

RGF231 [!] Diseña y analiza sistemas de control en el dominio frecuencial aplicando diferentes métodos: FT en lazo cerrado,

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métodos frecuenciales y lugar de las raíces. **NCH** СН ΤН LEARNING ACTIVITIES 2 h. Development and writing of records, reports, presentations, audiovisual material, etc. on 2 h. projects/work experience/challenges/case studies/experimental investigations carried out individually and/or in teams Conducting tests, giving presentations, presenting defences, taking examinations and/or doing 2 h. 2 h. checkpoints 10 h. Carrying out/resolving projects/challenges/cases, etc. to provide solutions to problems in 10 h. interdisciplinary contexts, real and/or simulated, individually and/or in teams Computer simulation exercises, individually and/or in teams 1 h. 4 h. 5 h. Presentation by the teacher in the classroom, in participatory classes, of concepts and 19,5 h. 19,5 h. procedures associated with the subjects 4 h. 8 h. 12 h. Carrying out exercises and solving problems individually and/or in teams **EVALUATION SYSTEM** w MAKE-UP MECHANISMS Reports on the completion of exercises, case studies, 50% Reports on the completion of exercises, case studies, computer computer exercises, simulation exercises, laboratory exercises, simulation exercises, laboratory exercises, term exercises, term projects, challenges and problems projects, challenges and problems Individual written and/or oral tests or individual 50% Individual written and/or oral tests or individual coding/programming tests coding/programming tests Comments: In "SE00000009", both the Coursework (30 %) and **Comments:** The Coursework must be retaken if mark <5 and with the POPBL (20 %) are taken into account. a maximum (retake) mark of 5. In case of failing the exam, the final mark will be: 25 % exam + 75 % retake exam.

CH - Class hours: 26,5 h. NCH - Non-class hours: 24 h. TH - Total hours: 50,5 h.

2RGF290 (2 sem)						
LEARNING ACTIVITIES			СН	NCH	тн	
Carrying out/resolving projects/challenges/cases, etc. to pro interdisciplinary contexts, real and/or simulated, individually	ovide sol and/or i	utions to problems in in teams	3 h.		3 h.	
EVALUATION SYSTEM	W	MAKE-UP MECHANI	SMS			
Self-assessment	25%		(No mech	anisms)		
Co-assessment	25%					
Observation (technical capacity, attitude and participation)	50%					
CH - Class hours: 3 h. NCH - Non-class hours: 0 h. TH - Total hours: 3 h.						

			СН	NCH	тн
Development and writing of records, reports, presentation projects/work experience/challenges/case studies/experir individually and/or in teams	ns, audiovi mental inve	sual material, etc. on estigations carried out	2 h.		2 h.
EVALUATION SYSTEM	W	MAKE-UP MECHAN	SMS		
	100%		(No mech	anisms)	
Reports on the completion of exercises, case studies, computer exercises, simulation exercises, laboratory exercises, term projects, challenges and problems					

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NCH - Non-class hours: 0 h. TH - Total hours: 2 h.

## CONTENTS

1. Introduction to control systems Introduction Definition of the system concept Definition of the control concept Basic control actions Closed-loop configuration using sensors

2. Modelling of linear dynamic systems Mathematical modelling of multi-physics systems Transfer function

3. Analysis of linear systems Time domain responses. Types of responses Frequency analysis of systems Controllers Stability analysis. Routh-Hurwith method Root locus analysis Accuracy of systems

4. Controller design Types of controllers Tuning techniques

 5. Electronic sensors for industrial applications Main characteristics of sensors
Temperature measurement
Measurement of electrical variables: voltage & current
Measurement of mechanical variables: position & velocity
Conditioners and measurement systems

## LEARNING RESOURCES AND BIBLIOGRAPHY

Learning resources

Moodle Platform Slides of the subject https://labur.eus/gHReJ

Bibliography