Goi Eskola Politeknikoa Escuela Politécnica

superior			CIONA					
		[MRD104]	SIGNA	L PROCESSI	NG			
		GENI	ERAL IN	FORMATION				
Studies	Master's Degree	e in ROBOTICS AND CO	NTROL	Subject	?			
	SYSTEMS							
Semester	2	Course 1		Mention / Field of	AUTONOMOU	S SYSTEMS	- EIT	
Character	OPTIONAL			specialisation				
Plan	2023	Modality Face	e-to-face	Language	ENGLISH			
Credits	6	Hours/week 0		Total hours	54 class hours	+ 96 non-clas	ss hours =	= <u>150 total</u>
					<u>hours</u>			
			PROFE	SSORS				
MENDICUT	TE ERRASTI, MI	KEL						
OLAIZOLA	ALBERDI, JON							
		REQUIRED) PREVIO	OUS KNOWLED	GE			
	Sub	jects			Know	ledge		
Circuit theory				Laplace transform				
Fundamentals of r	mathematics			Mathematics: comp	lex numbers, co	mplex expon	entials	
		<u>LE</u>	AR <u>NING</u>	RESULTS				
EARNING RESU	JLTS					кс ѕк	AB	ECTS
M1R216 - Choosin	ng and implemen	ing signal processing alg	orithms to	extract relevant inforr	mation	x		4,4
W1R223 - Ability to	o work in multidis	ciplinary teams and in a r	multilingual	environment and to o	communicate,	x		0,4
Vaster's degree	whiting, knowledg	Jo, procedures, results di	ina ineas lei					
M1R224 - To be al	ble to do their job	in cooperative, participa	tory enviror	ments, with awarene	ess of social	x		0,4
esponsibility.	, the knowledge	acquired and your proble	m colving c	kills in now little kno	wp or	Y		0.8
WIK220 - 10 apply	ments within broa	ader (or multidisciplinary)	contexts re	lated to your area of	studv	~		0,0
changing environi				,				
changing environi								
changing environi	ntent / SK: Skills / AE	t Abilitios					Total:	6
Changing environi	ntent / SK: Skills / AE	: Abilities SECONDA el uso práctico de algor	ARY LEA	RNING RESULT	Eñal en tiempo	real resolvie	Total:	6
Changing environi KC: Knowledge or Co. RA173 [!] Des problemas asoc	ntent / SK: Skills / AE arrolla y valida ciados a la solu	: Abilities SECONDA el uso práctico de algoi ción propuesta en entoi	ARY LEA ritmos de p rnos nuevo	RNING RESULT procesamiento de su os o poco conocido	ËS eñal en tiempo s	real resolvie	Total:	6
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CH - Class hours: 19 h. NCH - Non-class hours: 41 h. TH - Total hours: 60 h.

RA172 [!] Categoriza y evalúa algoritmos de filtrado adaptativo y monitorización de procesos cooperando para obtener la propuesta de manera participativa

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	3 h.	10 h.	13 h.
Computer simulation exercises, individually and/or in teams	4 h.	7 h.	11 h.
Presentation by the teacher in the classroom, in participatory classes, of concepts and procedures associated with the subjects	3 h.	10 h.	13 h.
Carrying out exercises and solving problems individually and/or in teams	7 h.	6 h.	13 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	30%	Reports on the completion of exercises, case studies, computer exercises, simulation exercises, laboratory exercises, term projects, challenges and problems
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	30%	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: All activities (control points, individual and gro etc.) must have a minimum grade of 5 and an opportunity for recovery (except the PBL). In unapproved training activities than 5) the recovery is compulsory and the final grade will b grade obtained in the recovery. In the activities carried out it necessary to obtain a minimum mark of 4 to calculate the av mark of the learning result. Otherwise, the note of the learnin will be that of the suspended activity. The system will calcul final grade with the RA, applying the percentages defined in	40% oup work, or (less e the t is verage ng result ate the IKOF.	Individual written and/or oral tests or individual coding/programming tests
CH - Class hours: 17 h.		

NCH - Non-class hours: 33 h.

TH - Total hours: 50 h.

RA171 [!] Identifica los fundamentos matemáticos del procesamiento de señal y los desarrolla en un contexto práctico tanto individualmente como en equipo

LEARNING ACTIVITIES			СН	NCH	TH
Computer simulation exercises, individually and/or in teams			6 h.	6 h.	12 h.
Presentation by the teacher in the classroom, in participatory classes, of concepts and procedures associated with the subjects			6 h.	10 h.	16 h.
Carrying out exercises and solving problems individually a	and/or in te	eams	6 h.	6 h.	12 h.
EVALUATION SYSTEM	w	MAKE-UP MECHAN	NISMS		
Reports on the completion of exercises, case studies, computer exercises, simulation exercises, laboratory exercises, term projects, challenges and problems	50%	Reports on the completion of exercises, case studies, computer exercises, simulation exercises, laboratory exercises, term projects, challenges and problems			idies, computer ises, term
Individual written and/or oral tests or individual coding/programming tests	50%	Individual written and/or oral tests or individual coding/programming tests			
Comments: All activities (control points, individual and gr etc.) must have a minimum grade of 5 and an opportunity frecovery (except the PBL). In unapproved training activities than 5) the recovery is compulsory and the final grade will be grade obtained in the recovery. In the activities carried out necessary to obtain a minimum mark of 4 to calculate the a	oup work, or s (less be the it is				



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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: 22 h. TH - Total hours: 40 h.

CONTENTS

- 0. Introduction
- 1. Mathematical basics of signal processing
- 1.1 Discrete systems
- 1.2 Basic operations
- 1.3 Spectral analysis
- 1.4 Z transform
- 2. Signal Processing Systems
- 2.1 Digital filters
- 2.2 Adaptive filters and observers
- 3. Industrial examples of signal processing systems

LEARNING RESOURCES AND BIBLIOGRAPHY

Learning resources

Moodle Platform Slides of the subject Specific Master Software Bibliography Digital Signal Processing: Principles, Algorithms and Applications, 3rd Edition, J.G. Proakis. D. Manolakis, 1996. Pearson. ISBN: 9780133737622.