

## SUBJECT TEACHING GUIDE

### G819 - Treatment of Signals

#### Degree in Telecommunication Technologies Engineering

Academic year 2023-2024

1. IDENTIFYING DATA					
Degree	Degree in Telecommunication Technologies Engineering			Type and Year	Compulsory. Year 2
Faculty	School of Industrial Engineering and Telecommunications				
Discipline	Subject Area: Signals and Communications Module in Common with the Telecommunications Branch				
Course unit title and code	G819 - Treatment of Signals				
Number of ECTS credits allocated	6	Term	Semester based (2)		
Web	<a href="http://gtas.unican.es/docencia/TS">http://gtas.unican.es/docencia/TS</a>				
Language of instruction	Spanish	English Friendly	No	Mode of delivery	Face-to-face

Department	DPTO. INGENIERIA DE COMUNICACIONES				
Name of lecturer	LUIS ANTONIO VIELVA MARTINEZ				
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Other lecturers					

3.1 LEARNING OUTCOMES	
- Knowledge and application of basic techniques for the analysis and processing of deterministic and random signals , both continuous and discrete .	
- Application of signal processing techniques in telecommunication systems	
- Model and solve problems of signal processing with Matlab	

#### 4. OBJECTIVES

Knowledge of the basic principles of representation, analysis and processing of discrete and continuous signals , both deterministic and random .

Application of these principles in telecommunications systems.

#### 6. COURSE ORGANIZATION

##### CONTENTS

1	Tools for the matrix formulation of signal processing : vector spaces , Hilbert spaces , matrix operations , matrix associated subspaces
2	Linear convolution , Fourier transforms and generalizations , circular convolution , eigenvalue problems , projections, digital filters , singular value decomposition
3	Total and partial characterization of n- dimensional random variables and stochastic processes.

#### 7. ASSESSMENT METHODS AND CRITERIA

Description	Type	Final Eval.	Reassessn	%
Final exam (PF)	Written exam	Yes	Yes	50,00
Assessment test 1 (PEC1)	Written exam	No	Yes	25,00
Assessment test 2 (PEC2)	Written exam	No	Yes	25,00
TOTAL				100,00
Observations				
The calification is calculated as $\max(PF, PF * 0.5 + PEC1 * 0.25 + PEC2 * 0.25)$				
The online evaluation of the works, laboratory practical exercises and written tests is foreseen in the event that a new health alert by COVID-19 makes it impossible to carry out the evaluation in person.				
Observations for part-time students				
The calification is calculated as $\max(PF, PF * 0.5 + PEC1 * 0.25 + PEC2 * 0.25)$				
The online evaluation of the works, laboratory practical exercises and written tests is foreseen in the event that a new health alert by COVID-19 makes it impossible to carry out the evaluation in person.				

#### 8. BIBLIOGRAPHY AND TEACHING MATERIALS

##### BASIC

Oppenheim & Schafer, "Tratamiento de señales en tiempo discreto", Prentice Hall

Strang, "Introduction to linear algebra"