

## SUBJECT TEACHING GUIDE

### 1087 - Signal Processing and Communications

### Master's Degree in Telecommunication Engineering

Academic year 2023-2024

1. IDENTIFYING DATA					
Degree	Master's Degree in Telecommunication Engineering			Type and Year	Optional. Year 1
Faculty	School of Industrial Engineering and Telecommunications				
Discipline	Optional Subjects				
Course unit title and code	1087 - Signal Processing and Communications				
Number of ECTS credits allocated	4	Term	Semester based (1)		
Web	<a href="http://gtas.unican.es/docencia/psc">http://gtas.unican.es/docencia/psc</a>				
Language of instruction	Spanish	English Friendly	Yes	Mode of delivery	Face-to-face

Department	DPTO. INGENIERIA DE COMUNICACIONES				
Name of lecturer	JAVIER VIA RODRIGUEZ				
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Other lecturers					

3.1 LEARNING OUTCOMES
- Signal space as a tool for analysis and design of digital communications systems.
- Influence of channel and noise in the performance of communications systems.
- Optimization of digital communication systems
- Knowledge of the characteristics, technics and algorithms of digital communications systems, with special focus on diversity and multicarrier modulations.
- Application of statistical techniques to solve classification problems, estimation problems, prediction problems, and optimal / adaptive filtering problems with focus on communication systems.

#### 4. OBJECTIVES

Solving of classification and detection problems.
Solving estimation problems.
Solving optimal filtering problems.
Analysis and design of digital communications systems using signal space in AWGN and fading channels.
Channel diversity techniques to enhance the performance of digital communications systems.
Physical layer aspects of some communication standards: WiFi, DVB, Bluetooth, ZigBee, UMTS, LTE, etc

#### 6. COURSE ORGANIZATION

CONTENTS	
1	Detection and classification Estimation
2	Stochastic processes Optimum filtering and adaptive filtering
3	Signals space. Communication channels. Diversity.
4	Multicarrier modulations

#### 7. ASSESSMENT METHODS AND CRITERIA

Description	Type	Final Eval.	Reassessn	%
Quiz 1	Written exam	No	Yes	50,00
Quiz 2	Written exam	No	Yes	50,00
Final exam	Written exam	Yes	Yes	0,00
<b>TOTAL</b>				<b>100,00</b>
<b>Observations</b>				
The final score is that of the final exam, except if the mean of the two partial exams is above 5.0 and the student do not want to take the final exam. In that case, the score is the mean of the partial exams.				
<b>Observations for part-time students</b>				
Part-Time Students can take the three exams				

#### 8. BIBLIOGRAPHY AND TEACHING MATERIALS

BASIC
S. M. Kay, Fundamentals of statistical signal processing, vol. I, Estimation theory, Prentice Hall, 1993
S. M. Kay, Fundamentals of statistical signal processing, vol. II, Detection theory, Prentice Hall, 1998
B. Sklar, Digital Communications. Fundamental s and Applications, 2 <sup>a</sup> edición, Prentice-Hall 2001
A. Goldsmith, Wireless Communications, Cambridge University Press, 2005

