

SUBJECT TEACHING GUIDE

G819 - Treatment of Signals

Degree in Telecommunication Technologies Engineering
 First Degree in Telecommunication Technologies Engineering

Academic year 2024-2025

| 1. IDENTIFYING DATA | | | | | |
|----------------------------------|--|------------------|--------------------|------------------|--|
| Degree | Degree in Telecommunication Technologies Engineering First Degree in Telecommunication Technologies Engineering | | | Type and Year | Compulsory. Year 2 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 | http://gtas.unican.es/docencia/TS | | | | |
| Language of instruction | Spanish | English Friendly | No | Mode of delivery | Face-to-face |

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| 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. SUBJECT PROGRAM

CONTENTS

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| 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 $\max(PF, (PEC1+PEC2)/2, PF * 0.5 + PEC1 * 0.25 + PEC2 * 0.25)$ | | | | |
| 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 $\max(PF, (PEC1+PEC2)/2, PF * 0.5 + PEC1 * 0.25 + PEC2 * 0.25)$ | | | | |
| 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"