

SUBJECT TEACHING GUIDE

G839 - Radiodetermination Systems

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	Optional. Year 4 Optional. Year 4
Faculty	School of Industrial Engineering and Telecommunications				
Discipline	Subject Area: Telecommunications Systems				
Course unit title and code	G839 - Radiodetermination Systems				
Number of ECTS credits allocated	6	Term	Semester based (1)		
Web	https://personales.unican.es/valle/SR/				
Language of instruction	Spanish	English Friendly	No	Mode of delivery	Face-to-face

Department	DPTO. INGENIERIA DE COMUNICACIONES				
Name of lecturer	LUIS VALLE LOPEZ				
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Office	Edificio Ing. de Telecomunicación Prof. José Luis García García. Planta: - 2. DESPACHO (S209)				
Other lecturers					

3.1 LEARNING OUTCOMES
- Select circuits, RF, microwave and radio-determination systems.
- Select antennas, transmission equipment and systems, propagation of guided and unguided waves by electromagnetic means, radiofrequency or optical. Knowledge of the electromagnetic spectrum and frequencies assignment.
- Communicate, both in writing and orally, knowledge, procedures, results and ideas related to telecommunications and electronics.

4. OBJECTIVES

To present the basic concepts and the characteristic parameters of different radar systems.
To present the main radar systems describing their operating principles and the basic parameters : pulsed radar, continuous wave radar, moving target indication, tracking radar, synthetic aperture radar
Intensify those aspects of propagation of electromagnetic waves of interest to radar systems, especially reflections and clutter.
To know the navigation aids more used at present.

6. SUBJECT PROGRAM

CONTENTS	
1	PART 1: Radar fundamentals. Pulsed radar. Radar equation. Continuous wave radar. Moving target indication. Tracking radar. Synthetic aperture radar.
2	PART 2: Radionavigation fundamentals. Beacons. Approach and landing systems. Secondary radars. Hyperbolic systems. Satellite navigation systems: GPS and Galileo.

7. ASSESSMENT METHODS AND CRITERIA

Description	Type	Final Eval.	Reassessn	%
First written exam.	Written exam	No	Yes	40,00
Second written exam.	Written exam	No	Yes	50,00
Laboratory practices.	Laboratory evaluation	No	Yes	10,00
Two midterm written exams (40% and 50% of the qualification). Evaluation of the laboratory practices (10% of the qualification). The subject can be passed through the midterm exams. Otherwise, a final exam must be taken. Evaluation criteria for part-tim	Written exam	No	Yes	0,00
TOTAL				100,00
Observations				
The student can pass the subject taking two exams during the semester. In another case, a final examination must be made at the end of the semester representing 90% of the final grade (laboratory practices are not recoverable).				
Observations for part-time students				
The part-time students can pass the subject making the final exam in case they can not take the midterms.				

8. BIBLIOGRAPHY AND TEACHING MATERIALS

BASIC
J.L. Eaves, E.K. Reedy. Principles of Modern Radar. Van Nostrand Reinhold, New York, 1987.
M.I. Skolnik. Introduction to Radar Systems. McGraw Hill (Second Edition), 1980.
N. Levanon. Radar Principles. John Wiley and Sons. 1988.
B.R. Mahafza. Introduction to Radar Analysis. CRC Press LLC 1998.
B. Forssell. Radionavigation Systems. Prentice Hall, 2008.
E. Kaplan, C.J. Hegarty. Understanding GPS: Principles And Applications. Artech House, 1996.

