

## SUBJECT TEACHING GUIDE

### G1483 - Radioelectric Systems

#### Degree in Telecommunication Technologies Engineering

Academic year 2024-2025

1. IDENTIFYING DATA					
Degree	Degree in Telecommunication Technologies Engineering			Type and Year	Optional. Year 4
Faculty	School of Industrial Engineering and Telecommunications				
Discipline	Speciality Optional Subjects				
Course unit title and code	G1483 - Radioelectric Systems				
Number of ECTS credits allocated	6	Term	Semester based (2)		
Web					
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	RAFAEL PEDRO TORRES JIMENEZ JESUS RAMON PEREZ LOPEZ				

3.1 LEARNING OUTCOMES
- Knows the advantages and limitations of radio systems.
- Knows and manages the basic parameters of the antennas of radio systems.
- Uses the basic parameters relating to the calculation of radio links.
- Knows and evaluates the impact of noise and interference in radio systems.
- Knows and applies the basic concepts related to radio propagation mechanisms to evaluate the losses of the link in different environments.
- Use the previous results for planning radio and satellite links.
- Knows the peculiarities of radar systems and their basic types. Performs simple radar calculations.

4. OBJECTIVES
To know the national and international regulations of radio systems.
To understand the limitations of the radio spectrum, noise and interference.
To know the different types of radio systems and services.
To acquire the ability to evaluate the advantages and disadvantages of radio systems instead of guided systems.
To acquire basic knowledge on antennas.
To acquire basic knowledge on radio propagation mechanisms.
To acquire the basic skills needed to plan fixed point to point radio links and to evaluate satellite links.
To acquire basic knowledge of radar systems.

6. SUBJECT PROGRAM	
CONTENTS	
1	Introduction. Basic terminology and definitions. Natural and logarithmic units. Electromagnetic spectrum. Structure of a radio system.
2	Fundamentals of radio systems. Antennas: types, parameters of transmitting and receiving antennas. Power balance. Noise. Interference.
3	Introduction of radar systems.
4	Basic radio propagation mechanisms. Propagation in the terrestrial environment. Reflection on flat earth. Surface wave. Influence of troposphere. Curved earth model. Propagation by diffraction. Ionospheric propagation. Effects of the atmosphere and hydrometeors.
5	Introduction to radio links and satellite systems.

7. ASSESSMENT METHODS AND CRITERIA				
Description	Type	Final Eval.	Reassessn	%
First written exam	Written exam	No	Yes	45,00
Second written exam	Written exam	No	Yes	45,00
Laboratory practices	Laboratory evaluation	No	No	10,00
Two midterm written exams (45% and 45% of the final 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. In the extraordinary call,	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.M. Hernando Rábanos. Transmisión por radio. Editorial Ramón Areces. Sexta edición. 2008.

J. Griffiths. Radiowave propagation and antennas. An introduction. Prentice-Hall Int., 1987.

J.L. Eaves, E.K. Reedy. Principles of Modern Radar. Van Nostrand Reinhold, New York, 1987.