SUBJECT TEACHING GUIDE

1093 - Systems and radio transmission services

Master's Degree in Telecommunication Engineering

Academic year 2026 - 2027

1. IDENTIFYING DATA					
Degree	Master's Degree in Telecommunication Engineering			Type and Year	Compulsory. Year 1
Faculty	School of Industrial Engineering and Telecommunications				
Discipline					
Course unit title and code	1093 - Systems and radio transmission services				
Number of ECTS credits allocated	5	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	JESUS RAMON PEREZ LOPEZ
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Other lecturers	RAFAEL PEDRO TORRES JIMENEZ LUIS VALLE LOPEZ

3.1 LEARNING OUTCOMES
The student plans systems to provide radio services.
Carries out radio link budgets and plans radio-links for the terrestrial service.
Designs terrestrial broadcasting systems, radar and radionavigation systems.
Sizes and plans mobile communications systems.

4. OBJECTIVES
Know the different types of radioelectric systems and the services they provide.
Achieve the competences to deal with the planning of radio-links.
Present the evolution of mobile communications systems, their architecture, standards and the regulatory bodies.

Introduce the main radar systems describing their principles of operation as well as their basic characteristic parameters.
Analyze the characteristics of 2G, 3G and 4G mobile systems, their architecture and services.

6. COURSE ORGANIZATION

CONTENTS	
1	BLOCK 1. Introduction to the radio systems. Radio-links, link budget, architecture and modulations.Broadcasting systems.
2	BLOCK 2. Radar systems, radiolocation and radionavigation. Satellite positioning systems.
3	BLOCK 3. Terrestrial mobile communications systems 2G-5G. Specifications, architecture and the radio interface for GSM, UMTS and LTE/LTE-Advanced systems.

7. ASSESSMENT METHODS AND CRITERIA

Description	Type	Final Eval.	Reassessment	%
Exam, BLOCK 1	Written exam	No	Yes	40,00
Exam BLOCK 2	Written exam	No	Yes	30,00
Exam BLOCK 3	Written exam	No	Yes	30,00
TOTAL				100,00

Observations

There are two ways of evaluation, a continuous evaluation during the four-month period according to the previous description outlined, or a final exam.

Regarding to the continuous evaluation and concerning the three exams proposed, if either the minimum mark is not achieved (3.5) or in case an alternative evaluation is desired, it should be taken the final exam, representing the 100% of the final mark.

The extraordinary exam will take 100% of the final mark.

Observations for part-time students

The statements mentioned above for full-time students are applicable for those partial-time.

8. BIBLIOGRAPHY AND TEACHING MATERIALS

BASIC

S.R. Saunders, A. A. Zavala. Antennas and Propagation for Wireless Communication Systems. John Wiley and Sons, second edition, 2007.

J. M. Hernando Rábanos. Transmisión por radio. Editorial Ramón Areces. Séptima edición. 2013.

J.M. Hernando Rábanos. Comunicaciones Móviles. Editorial Ramón Areces, Tercera Edición, 2015.

A. F. Molisch. Wireless Communications. Wiley, second edition, 2010.

E. Dahlman, S. Parkvall, J. Sköld, 4G LTE / LTE-Advanced for Mobiler Broadband. Academic Press, second edition, 2014.

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

E. Kaplan, C.J. Hegarty. Understanding GPS: Principles And Applications. Artech House, 1996.