

## SUBJECT TEACHING GUIDE

G1482 - Active Radiofrequency and Microwave Circuits

Degree in Telecommunication Technologies Engineering

Academic year 2021-2022

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	G1482 - Active Radiofrequency and Microwave Circuits				
Number of ECTS credits allocated	6	Term	Semester based (2)		
Web					
Language of instruction	Spanish	English Friendly	Yes	Mode of delivery	Face-to-face

Department	DPTO. INGENIERIA DE COMUNICACIONES				
Name of lecturer	LUISA MARIA DE LA FUENTE RODRIGUEZ				
E-mail	luisa.delafuente@unican.es				
Office	Edificio Ing. de Telecomunicación Prof. José Luis García García. Planta: - 1. DESPACHO (S140)				
Other lecturers	SERGIO MIGUEL SANCHO LUCIO				

3.1 LEARNING OUTCOMES
- Apply strategies for solving technical problems of their own profession
- Ability to work cooperatively in teams
- Student responsiveness to problems of real life, as it will happen in the real work.
- Distinction of the peculiarities of RF and microwave circuits compared with conventional electrical and electronic circuits of DC and low frequency
- Acquainted with the fundamental elements of the basic architecture of RF systems.

#### 4. OBJECTIVES

In this subject, RF and Microwave active components will be studied. The aim of this subject is to improve the contents already seen in "Electrónica de RF". It starts with a revision of the devices presented, following with the design of small signal and power amplifiers. Next, several basic subsystems like mixers, detectors, oscillators, voltage controlled oscillators and phase locked loops will be studied and the main topologies will be presented.

#### 6. COURSE ORGANIZATION

CONTENTS	
1	SOLID STATE DEVICES: CHARACTERISTICS AND MODELLING
2	DESIGN OF AMPLIFIERS
3	MIXERS: THEORY AND DESIGN
4	OSCILLATORS AND PHASE LOCKED LOOPS

#### 7. ASSESSMENT METHODS AND CRITERIA

Description	Type	Final Eval.	Reassessn	%
Written test: 70%	Written exam	No	Yes	40,00
Lab practices: 30%	Laboratory evaluation	No	Yes	60,00
TOTAL				100,00
Observations				
Those students who have not passed any test or, continuous assessment has not been followed, may be submitted to a Final Exam, whose percentage of the final grade will be 70%. The labs are required to pass the course.				
Observations for part-time students				
For part-time students, the evaluation criteria will be the same to those explained above.				

#### 8. BIBLIOGRAPHY AND TEACHING MATERIALS

BASIC
"Microwave Transistor Amplifiers: Analysis and Design", Second Edition. Guillermo Gonzalez. Prentice Hall, Inc. 1997.
"Microwave Devices, Circuits and Systems for Communications Engineering", Ed. I.G. Glover, S.R. Pennock y P.R. Shepherd, Wiley, 2005.
"Microwave circuit design using linear and nonlinear techniques", George D. Vendelin, Anthony M. Pavio, Ulrich L. Rohde,
"Microwave Engineering", David M. Pozar. Wiley, 4th Edition, November 2011
"Non Linear Microwave and RF Circuits", S. A. Maas, Artech House, 2003.
"RF Circuit Design, Theory and Applications", R. Ludwig, P. Bretchko. Prentice Hall
"Microwave Mixers", S. A. Maas, 3rd edn, Artech House, MA
Floyd M. Gardner, Phaselock Techniques, Wiley

