SUBJECT TEACHING GUIDE

G1485 - Radiofrequency Systems

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	G1485 - Radiofrequency Systems				
Number of ECTS credits allocated	6	Term		Semester based (1)	
Web					
Language of instruction	Spanish	English Friendly	Yes	Mode of delivery	Face-to-face

Department	DPTO. INGENIERIA DE COMUNICACIONES
Name of lecturer	ALMUDENA SUAREZ RODRIGUEZ
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Office	Edificio Ing. de Telecomunicación Prof. José Luis García García. Planta: - 1. DESPACHO (S127)
Other lecturers	FRANCO ARIEL RAMIREZ TERAN MARIA ISABEL PONTON LOBETE

3.1 LEARNING OUTCOMES
- Skills to apply the acquired knowledge to microwave engineering applying basic tools and concepts, e.g. impedance matching, scattering parameters, transmission lines, impedance transformers, couples, circulators, etc.
- Capability to comprehend the basic principles of the different components studied in the subject (diode-based circuits, amplifiers, oscillators)
- Capabilities to carry out, in an efficient manner, the design and analysis of microwave circuits studied in the subject.
- Capability to apply analysis tools to face different problems.
- Knowledge of microwave systems where the different components studied during the subject are used.

4. OBJECTIVES
To broaden and consolidate the acquired knowledge in the field of microwave engineering.
To facilitate an understanding of the operating principles of the components studied (diode-based circuits, amplifiers and oscillators),of the equivalent models and the characteristics of the used devices and different design parameters .
Provide the necessary mathematical concepts and essential information to the student for the analysis and design of the circuits discussed.
To provide general and basic tools and analysis and design criteria , so the student will be capable to face problems different to those considered in this course.
To provide students with a sound background that increases their knowledge about microwave communication systems in which the components studied are used.

6. COURSE ORGANIZATION	
CONTENTS	
1	Introduction
2	Microwave and RF diodes and transistors
3	Negative resistance amplifiers
4	Small-signal amplifiers
5	Microwave oscillators
6	Mixers
7	Phase-locked loops
8	Analysis methods and techniques for nonlinear circuits

7. ASSESSMENT METHODS AND CRITERIA

Description	Type	Final Eval.	Reassessn	%
Continuous Assessment Tests One test at the end of each teaching module	Work	No	Yes	30,00
Simulation practices. Students must solve different problems that will correspond to the components studied in the theoretical classes.	Laboratory evaluation	No	Yes	20,00
Individual work Students must present a report detailing the design and analysis of microwave circuits according to provided specifications.	Work	No	Yes	50,00
TOTAL				100,00

Observations

30% CA tests
20% Simulation reports/tests
50% Final report

Observations for part-time students

Partial time students will be evaluated by means of a written report, oriented to a design project to be specified during the classes period (95%) and practical laboratory sessions(5%).

8. BIBLIOGRAPHY AND TEACHING MATERIALS

BASIC

R.E. Collin, Foundations for microwave engineering, 2º Edición. McGraw-Hill. 1992

Tri. T. Ha, Solid-state microwave amplifier design, John Wiley and Sons, 1981

W. Stephen Cheung, Frederic H. Levien, Microwaves made simple. Principles and applications, Artech House. 1985

K. Chang, Microwave Solid-state components, NY: John Wiley & Sons, (1990).

A. Suarez, Analysis and design og autonomous microwave circuits, IEEE - Wiley, 2009.