SUBJECT TEACHING GUIDE

G834 - Guided Transmission Media

Degree in Telecommunication Technologies Engineering

Academic year 2019-2020

1. IDENTIFYING DATA					
Degree	Degree in Telecommunication Technologies Engineering			Type and Year	Optional. Year 3
Faculty	School of Industrial Engineering and Telecommunications				
Discipline	Subject Area: Transmission and Treatment of Signals				
Course unit title and code	G834 - Guided Transmission Media				
Number of ECTS credits allocated	6	Term		Semester based (1)	
Web					
Language of instruction	Spanish	English Friendly	No	Mode of delivery	Face-to-face

Department	DPTO. INGENIERIA DE COMUNICACIONES
Name of lecturer	OSCAR FERNANDEZ FERNANDEZ
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Other lecturers	ANTONIO TAZON PUENTE

3.1 LEARNING OUTCOMES

- To know the basic concepts of transmission line theory (circuit model, voltage and current waves, impedance, power, etc ...)
- Understand concepts related to loaded transmission lines (reflection coefficient, standing waves, input impedance, etc ...)
- Understand the behavior of transmission lines in transient state
- Understand the concept of waveguide and the electromagnetic model transmission lines as well as the most important types of guides and transmission lines (rectangular waveguide, coaxial cable, planar lines, etc ...)
- To know the basic microwave circuits, and its main technologies and devices
- To solve transmission line problems by the Smith chart
- Knowing and applying several techniques of impedance matching
- Perform basic laboratory measurements of transmission lines and rectangular waveguides

4. OBJECTIVES

The aim of this subject is to present the general theory of waveguides and transmission lines and its application in the field of microwave circuits. It also deals with the resolution of practical problems and the student is introduced to the basic instrumentation and measurement laboratory techniques.

6. COURSE ORGANIZATION

	CONTENTS
1	BLOCK 1 Subject 1. Basic concepts of the transmission line theory. Introduction. Circuital model of a transmission line. General equations of a transmission line. Solution of the wave equation in the time domain. Solution of the wave equation in the frequency domain. Lines with low losses and without losses. Power. Subject 2. Mismatch transmission lines Introduction. Reflection, Standing waves. Input impedance. Mismatch in the load and generator. Transient Response. Subject 3.Waveguides and transmission lines. Introduction. General solutions for TEM, TE and TM waves. The parallel planes guide. The rectangular guide. The circular wave guide. The coaxial cable. Planar lines.
2	BLOCK 2 Subject 4. Introduction to microwave circuits Introduction. Equivalent voltajes and currents. Impedance and admitance parameters. Scattering parameters Subject 5. Smith Chart Introduction. Smith Chart. Simple calculations. Smith Chart of admitances Subject 6. Impedance matching Introduction. Discrete networks of two elements in L. Simple stub. Double stub. Quarter-wave transformer

7. ASSESSMENT METHODS AND CRITERIA

Description	Type	Final Eval.	Reassessn	%
Written exam of problems and issues of block 1	Written exam	No	Yes	41,00
Written exam of problems and issues of block 2	Written exam	No	Yes	41,00
Evaluation of laboratory practices	Laboratory evaluation	No	No	18,00
Written final exam of problems and short questions	Written exam	Yes	Yes	0,00
TOTAL				100,00

Observations

The final evaluation for the course will be calculated by the average score of the obtained partial notes (each block + evaluation of practices).
To make this average score is a necessary condition that in each partial note has been obtained at least 4 (of a maximun of 10).
The aim of the final examination is to recover those written exams that were not passed during the semester.
The realization of the practices is mandatory and they have not recovery.

Observations for part-time students

8. BIBLIOGRAPHY AND TEACHING MATERIALS

BASIC

D. M. Pozar, "Microwave Engineering", 3ª Ed., Wiley, New Jersey, 2005.
R. Neri, "Líneas de Transmisión", McGraw-Hill, 1999.