Program	**09TT- Engineering in Telecommunication Technologies and Services**

Course number and name	
Number	95000040
Name	Microwave Engineering Microondas
Semester	Y4-S7

Credits and contact hours	
ECTS Credits	4.5
Contact hours	45

Coordinator's name	Mariano Barba

Specific course information		
Description of course content		
A course about the foundations of microwave engineering covering transmission lines and waveguides, impedance matching, microwave network and some passive devices description.		
List of topics to be covered		
1. Review of the propagation phenomena in transmission lines. 2. Common transmission lines in engineering. Waveguides. 3. Impedance matching. 4. Microwave networks. 5. Review of common microwave passive devices. 6. S parameter measurement practices.		
Prerequisites or co-requisites		
It is assumed that student have followed the course of "Fields and Waves in Telecommunication".		
Course category in the program		
__ R (required)	**__ E (elective)**	***X*** **_ SE (selective elective)**

Specific goals for the course
Specific outcomes of instruction
RA1: Consolidation of the understanding of the propagation phenomena in transmission lines. RA2: Understanding and knowledge of features and characteristics of the common TEM transmission lines used in microwave engineering. Understanding and knowledge of the features and characteristic of waveguides (rectangular and circular). Having the ability of selecting the proper transmission media according to the needs in a given application.

RA3: Knowledge of the concept of matching impedance and the procedures to reach it in high frequency. Ability of the use of Smith Chart for impedance matching, understating of circuits behaviour from the Smith Chart response. RA4: Knowledge and ability in the use of S, ABCD and Z parameters used to describe microwave networks. Understanding of S parameters to extract the behaviour of microwave circuits. Ability to extract the response of microwave networks after the connection of simple circuits. RA5: Understanding and ability of explaining the features of the common passive circuits used in microwave engineering. RA6: Ability of measuring the S parameters with understanding of the calibration process of two ports microwave circuits. Ability of use microwave instrumentation.
Student outcomes addressed by the course
CE-ST3,CE-ST4, CE-ST5 CG2 , CG4,CG5, CG9, CG12

Bibliography and supplemental materials
Reference bibliography for the course. ”Microwave Engineering”, D.M. Pozar, (Ed. Addison-Wesley, 1993). (John Wiley and sons, Inc, 1998) (John Wiley and Sons, Inc, 2005, 2011, 3rd and 4th edition) Other essential bibliography. “Foundations for Microwave Engineering”, Robert E. Collin, Ed. McGraw-Hill, Inc., 1992 “Microwave Engineering. Passive Circuits”, Peter A. Rizzi, Ed. Prentice-Hall, Inc., 1998 Additional bibliography “Field and Waves in Communications Electronics”, S. Ramo, J.R. Whinnery, T.V. Duzzer, 3th edition, John Wiley and Sons, 1993. “An Introduction to Guided Waves and Microwaves Circuits”, R.S. Elliot, Ed. Prentice-Hall, 1998 “Advanced Engineering Electromagnetics” C.A. Balanis. John Wiley and Sons. “Microwave filters, impedance-matching networks and coupling structures”, G.L. Mathei, L. Young, E.M.T. Jones, Artech House, 1980. (Reimpresión de la edición de Mc-Graw-Hill 1960 “Computer Aided Design of Microwave Circuits”, K. C. Gupta, Ed. Artech House, 1981 “Principles of Microwave Circuits”, C. G. Montgomery, R. H. Dicke, and E. M. Purcell.

Teaching methodology			
__ lectures X	**__ problem solving sessions** **X**	**__ collaborative actions**	**__ laboratory sessions** **X**
Other:			