Course Unit Description - (SISTEL)

(Telecommunications Systems)

(Mestrado em Engenharia Electrotécnica e de Computadores)

Academic year: 2009/2010

isep

Subject group: Electrónica e Telecomunicações

	Semestral		Compulsory	
Mode of study	Diurno	**Hours/Week**	**T-**Teórica	2
Year	1º		**PL-**Prática-Laboratorial	2
Semester	1º		**OT-**Orientação Tutorial	1

ECTS 6

Objectives

The student must be able to understand, analyze and design a telecommunication system

Course Contents

Random processes
Probability. Random variables and processes. Random processes in the frequency domain. Gaussian and white processes. Bandlimited processes and sampling. Bandpass processes.

Effect of noise on analog communication systems
Effect of noise on linear modulation systems. Carrier phase estimation with a Phase-locked loop. Effect of noise on angle modulation. Comparison of analog modulation systems

Digital transmission trough an additive white Gaussian noise channel
Pulse modulation signals and their geometric representation. Optimum receiver for pulse-modulated signals in additive white Gaussian noise. Probability of error for signals in additive white Gaussian noise. Regenerative Repeaters and link budget analysis.

Electromagnetic waves
Propagation of electromagnetic waves. Wave guides, strip line, microstrip line and slot line

Recommended reading

Carlson, A.B., 'Communication Systems', McGraw-Hill.
Proakis, J.C., Salehi, M.,, 'Communication Systems Engineering', Prentice-Hall.
Couch II, Leon W., 'Digital and Analog Communication Systems' Macmillan Publishing Co., Inc
Dunlop, J., Smith, D.G., 'Telecommunications Engineering', Van Nostrand Reinhold Co. Ltd
Ramo, S., Whinnery, J.R., Van Duzer, T., 'Fields and Waves in Communication electronics', John Wiley and Sons
Adler, R.B., Chu, L.J., Fano, R.M., 'Electromagnetic Energy Transmission and Radiation', M.I.T. Press
Chipman, R.A., 'Transmission Lines', McGraw-Hill

Teaching Methods

Course contents will be presented using, mainly, the expositive method supported by the presentation of examples and analysis of case studies. Problems will be proposed, studied, and solved. The discussion of demonstration problems and exercises will be promoted.

Each student is required to develop an individual work, in the scientific area of the course.

Both class slides and problem sets will be available in advance at the repository: https://moodle.isep.ipp.pt/.

Assessment methods

The student must submit a written report of the individual research work developed. It is, also, required to have an oral presentation. (25%)

Final exam by the end of the semester. Note that all written examinations will address key principles and problems lectured throughout the semester. (75%)

	Name
Teacher responsible:	Alexandra Maria Soares Ferreira Galhano (AMF)
Lecturer:	Alexandra Maria Soares Ferreira Galhano (AMF) Francisco Jose Dias Pereira (FDP)