Course Unit Description - (RECOP)

(Optical Communications Networks)

(Mestrado em Engenharia Electrotécnica e de Computadores)

Academic year: 2009/2010

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 should be capable of:
Know and understand the architecture and the functionality of an optical communications network;
Know and understand several types of optical communications network;
Analyze and resolve problems about the commutation in optical communications networks;
Understand the functionality of several components in optical communications networks.

Course Contents

1. Introduction.
2. Architecture and evolution of optical networks.
3. Time domain medium access.
4. Wavelength domain medium access (WDM e DWDM).
5. Multiplexing, demultiplexing, coupling, sources, ...
6. Optical amplification.
7. Erbium doped optical fiber amplifiers; semiconductors optical amplifiers; Raman amplification in optical communications.
8. Optical regeneration.
9. Optical commutation.
10. Applications, requirements, architectures, technologies and solutions.
11. Access optical networks.
12. High capacity networks.
13. Fiber optics submarine systems.
14. Ethernet network.
15. Optical communications networks non-linearities.
16. Future developments.

Recommended reading

"Optical Fiber Telecommunications IV A & B, Systems and Impairments", I. Kaminow, T. Li, Academic Press 2002;
Optical Networks: A practical Perspective (second edition)", R. Ramaswami, K. Sivarajan, Morgan Kaufmann 2002;
"Principles and Applications of Optical Communications", Max M. Liu, Irwin 1996
"Redes de Comunicações Ópticas", teatcher notes.

Teaching Methods

The teaching methods are based on two fundamental vectors. Theoretical lectures promoting the discussion of the subjects and participation of the students. The second vector focus on the development of problem solving skills of the students. The students are always invited to get new sources of information.

Assessment methods

Continuous evaluation (NFREQ) 30%.
Exam (PE) 70%

Classification:
(xNFREQ + yPE)/(x + y)

x = 30% Min 6; y = 70% Min 7;

	Name
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Lecturer:	Francisco Jose Dias Pereira (FDP)