Optical networking technologies

Academic Year: (2019 / 2020)   **Review date: 07-01-2020**

Department assigned to the subject: Electronic Technology Department

Coordinating teacher: VAZQUEZ GARCIA, MARIA CARMEN

Type: Electives ECTS Credits : 3.0

Year : 2 Semester : 1

OBJECTIVES

Competences and skills

-Acquire skills for understanding new technologies involved in optical networks and their appropriate use and integration to solve new problems or applications.
-Knowing the capabilities of new photonic components to improve the performance of optical networks such as routers, switches, amplifiers.
-Ability to handle optical networks design tools.
-Ability to develop effective information search and to identify the state of the art technology in optical networks and their possible application in new systems.
-Knowing the state of the art and future trends in optical networking technologies.

Learning results
- Identifying the technologies commonly used in different types of optical networks.
-Design Circuits or subsystems capable of combining functions to manipulate light such as: modulation , filtering , multiplexing, switching , amplification and beam splitting .
-Choose the right technology depending on the specifications of the physical layer in optical networks.
-Knowing some basic measurement techniques for the characterization of optical networks.
-Usage of specific tools for designing optical networks.
- Knowledge of optical integrated circuits as key elements in optical networks.
-To know the latest advances in various technologies of optical networks.

DESCRIPTION OF CONTENTS: PROGRAMME
1.   Optical fiber basics
2.   Connectors and passive devices
3.   Active devices
4.   Photonics Integrated Circuits
5.   Optical communications networks principles
6.   Wavelength Division Multiplexing Networks Technologies
7.   Technologies in Access and in Switched Optical Networks
8.   Impact of new technologies under development on optical systems and networks

LEARNING ACTIVITIES AND METHODOLOGY
Lectures
Exercises
Laboratory work
Tutorials
Team group
Individual reports

ASSESSMENT SYSTEM
Ordinary exam:
-Test 40%
-exercises and lab reports (team work) 30%
-lectures discussions and seminars 10%
-project work and public defense 20%

Extraordinary exam:
The same as ordinary exam or a final exam with 100%

% end-of-term-examination: 40

% of continuous assessment (assigments, laboratory, practicals…):   60

BASIC BIBLIOGRAPHY

- null Fiber Optic Measurement Techniques, Academic Press, 2008

- I Kaminov et al Optical Fiber Telecommunications Volumen VIA:Components and Subsystems, Academic Press , 2013
- Senior Optical Fiber Communications: principles and practice, Prentice Hall, 1992

ADDITIONAL BIBLIOGRAPHY

- B Li et al, chapter 9: C Vázquez et al chapter 9: Optical switches materials and design, Woodhead Publishing Limited, 2010
- A Texeira et al. chapter2: C Vázquez et al Optical Transmission The FP7 BONE Project Experience, Ch2: Signal Processing, Management and Monitoring in Transmission Networks, Springer , 2012