Broadband networks

Academic Year: **(2021 / 2022)**   **Review date: 07-09-2020**

Department assigned to the subject:

Coordinating teacher: HERNANDEZ GUTIERREZ, JOSE ALBERTO

Type: Electives ECTS Credits : 3.0

Year : 1 Semester :

REQUIREMENTS (SUBJECTS THAT ARE ASSUMED TO BE KNOWN)

The students of this course should have a previous knowledge about optical communications, switching fundamentals and Ethernet-based local area networks (LAN)

OBJECTIVES

The competences acquired by the students of this course will be:
- To know which are the most important optical communication technologies in access, metro and core networks.
- To understand which are the current challenges of the different research areas studied by the course.
- To be able to review and analyze papers from the different fields studied by the course.

DESCRIPTION OF CONTENTS: PROGRAMME

1. Optical Networks:
  1.1. Switching in optical networks (WDM, Optical devices, OWS/OBS/OPS)
  1.2. Optical access networks (FTTx, PON, WDM-PON)
  1.3. Optical metro networks (TT-FR/FT-TR optical rings)
  1.4. Optical transport networks (SONET/SDH, OTN)

2. Transport Networks
  2.1. MPLS-TP & GMPLS (OAM)
  2.2. Protection Mechanisms
  2.3. Virtual Private Networks (L3VPN, L2VPN, VPLS, L1VPN)

3. Evolution of Ethernet Networks:
  3.1. Metro Ethernet networks (ME, PB, PBB-TE)
  3.2. Energy Efficient Ethernet (EEE)

LEARNING ACTIVITIES AND METHODOLOGY

The teaching of this course is based on two kinds of presential classes:
- Lecture sessions: Summary presentation of the most important aspects and detailed explanation of the main concepts.
- Demonstration session: Critical review of the proposed research papers and answering of doubts from the self-learning process.

Additionally, the student must widen the knowledge acquired in lecture sessions and analyse the research papers proposed for critical review.

ASSESSMENT SYSTEM

The evaluation of this course will be performed in a continuous way. Also there is a final exem that covers all the topics studied during the course. The final mark will be computed as:
- Participation in classes, and review of research papers (10%).
- Assignment and presentation to the class (60%)
- Final exam (40%).

% end-of-term-examination: 40

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

BASIC BIBLIOGRAPHY

- B. Davie, Y. Rekhter MPLS: Multiprotocol Label Switching Technology and Applications, Morgan Kaufmann, 2000

- B. Mukherjee Optical WDM networks, Springer, 2006

ADDITIONAL BIBLIOGRAPHY
- M. Maier Optical switching networks, Cambridge University Press, 2008
- P. Tomsu, G. Wieser MPLS-based VPNs, Prentice Hall, 2002