30355 - Network Design and Assessment

Información del Plan Docente

Academic Year	2016/17
Academic center	110 - Escuela de Ingeniería y Arquitectura
Degree	438 - Bachelor's Degree in Telecomunications Technology and Services Engineering
ECTS	6.0
Course	4
Period	First semester
Subject Type	Compulsory
Module	---

1.Basic info

1.1.Recommendations to take this course

1.2.Activities and key dates for the course

2.Initiation

2.1.Learning outcomes that define the subject

2.2.Introduction

3.Context and competences

3.1.Goals

3.2.Context and meaning of the subject in the degree

3.3.Competences

3.4.Importance of learning outcomes

4.Evaluation

5.Activities and resources

5.1.General methodological presentation

The subject program is developed through the following methodologies :

Classroom and laboratory methodology: lectures (M1), resolution of practical problems in the classroom (M8), lab practices (M9) and evaluation (M11). Aditionally, students will be personally attended through tutoring sessions (M10)

30355 - Network Design and Assessment

Autonomous learning: In addition to the lectures and labs, the learning activities will require autonomous learning: practical work (M13), theoretical (M14) and practical (M13) study.

5.2.Learning activities

The activities used to reach the proposed learning outcomes are:

A01: Lectures (16 hours) . This activity will take place in the classroom. Together with the individual study (A07), this activity is designed to provide to the students the theoretical basis of the subject.

A02: R esolution of practical problems (8 hours). This activity will take place in the classroom and may require previous work from the students (A07).

A03: Lab practices (36 horas). Students will do 3-hour practical sessions in the lab each week. This activity will take place in the Lab 2.03 (Telematics Lab) in Ada Byron building. The practical work will be done in small groups, configuring and analyzing different network scenarios, related to the theoretical concepts seen in the lectures. Each lab practive may consist of one or more sessions. When needed for the lab, the presentation of previous work will be required (A07). In addition, at the end of each lab, a test will be done (A08).

A06: Tutoring sessions . Hours of personalized attention to students to review and discuss the materials and topics presented in both lectures and labs.

A08: Evaluation. Set of written tests (t heoretical and practical) and presentation of reports to evaluate the student progress . Details are given in the Evaluation section .

5.3.Program

Lecture and lab contents:

- Design of Local Area Networks (LAN), TCP/IP configuration in a corporate environment:
  - NAT implementation (*Network Address Traslation*), DHCP (*Dynamic Host Configuration Protocol*) and DNS (*Domain Name System*)
  - Configuration of *Virtual* LAN (VLAN)
- Design of Wide Area Networks (WAN), global connectivity:
  - Intra-AS Routing or IGP (*Interior Gateway Protocol*)
    - Case of use: OSPF. Operation in a multiarea network
  - Inter-AS Routing or EGP (*Exterior Gateway Protocol*)
    - Case of use: BGP. Interconnection of *Autonomous Systems* (AS)
- Evaluation of characteristic parameters on communicaions, equipments and network technologies:
  - Evaluation of TCP congestion control: comparison between TCP versions, performance evaluation and adaptation to the application scenario.
  - Monitoring and estimation techniques on the equipments where the applications are located.
    - Case of use: Monitoring and estimation of end-to-end delay and bandwidth.
    - Case of use: characterization of buffers on real equipments.

30355 - Network Design and Assessment

5.4.Planning and scheduling

Schedule of lectures, labs and presentation of reports

The subject schedule will be defined by the center in the academic calendar of the corresponding course.

5.5.Bibliography and recomended resources

Basic bibliography:

BB Kurose, James F.. Computer networking : a top-down approach / James F. Kurose, Keith W. Ross ; international edition adapted by Bhojan Anand . - 4th ed. Boston : Pearson, cop. 2008
BB Stevens, W. Richard. TCP/IP illustrated. Vol. 1, The protocols / W. Richard Stevens . - [10th. print.] Reading, Massachusetts [etc.] : Addison-Wesley, 1997

URLs:

IETF Request For Comments (RFC): documentos de especificaciones (varios) - [http://www.ietf.org/rfc.html]
The TCP/IP guide - [http://www.tcpipguide.com/free/t_toc.htm]