

30355 - Network Design and Evaluation

Syllabus Information

Academic Year: 2019/20

Subject: 30355 - Network Design and Evaluation

Faculty / School: 110 - Escuela de Ingeniería y Arquitectura

Degree: 438 - Bachelor's Degree in Telecommunications Technology and Services Engineering

ECTS: 6.0

Year: 4

Semester: First semester

Subject Type: Compulsory

Module: ---

1.General information

1.1.Aims of the course

1.2.Context and importance of this course in the degree

1.3.Recommendations to take this course

2.Learning goals

2.1.Competences

2.2.Learning goals

2.3.Importance of learning goals

3.Assessment (1st and 2nd call)

3.1.Assessment tasks (description of tasks, marking system and assessment criteria)

4.Methodology, learning tasks, syllabus and resources

4.1.Methodological overview

The subject program is developed through the following methodologies:

Classroom and laboratory methodology: lectures (M1), practice sessions (M8), lab sessions (M9) and evaluation (M11). Additionally, students will be personally attended through tutorials (M10)

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

4.2.Learning tasks

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 the students with the theoretical basis of the subject.

A02: Practice sessions (8 hours). This activity will take place in the classroom and may require previous work from the students (A07).

A03: Lab sessions (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 practice 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: Tutorials. Hours of personalized attention to students to review and discuss the materials and topics presented in both

lectures and labs.

A08: Assessment. Set of written tests (theoretical and practical) and presentation of reports to evaluate the student progress.

4.3.Syllabus

Lecture and lab contents:

- Design of Local Area Networks (LAN), TCP/IP configuration in a corporate environment:
 - NAT implementation (*Network Address Translation*), 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 communications, equipment 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 equipment 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 equipment.

4.4.Course planning and calendar

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.

4.5.Bibliography and recommended resources

http://biblos.unizar.es/br/br_citas.php?codigo=30355&year=2019