

30159 - Communication Networks and Services

Syllabus Information

Academic year: 2023/24

Subject: 30159 - Communication Networks and Services

Faculty / School: 179 - Centro Universitario de la Defensa - Zaragoza

Degree: 563 - Bachelor's Degree in Industrial Organisational Engineering

ECTS: 6.0

Year: 4

Semester: First semester

Subject type: Optional

Module:

1. General information

The main objective of the subject is that the students acquire the basic concepts of the operation of a network of computers. To this end, the subject presents the different layers that make up the TCP/IP protocol architecture, since it is the one used in all current communication networks. It also explains the principles of operation of the main switching equipment (routers and switches) used in any network today.

These approaches and objectives are aligned with the Sustainable Development Goals (SDGs) of the 2030 Agenda of United Nations (<https://www.un.org/sustainabledevelopment/es/>) "Decent work and economic growth" and "Industry, innovation and infrastructure", so that the acquisition of the learning results of the subject provides training and competence to contribute to some extent to their achievement.

2. Learning results

1. Define the basic principles and describe network architectures and communication services.
2. Identify and describe the telephone network, mobile networks, public data networks and solve problems related to the network level

3. Syllabus

The program of the subject includes the following topics:

- TOPIC 1: INTRODUCTION: Introduction to communications networks and protocol architecture: TCP/IP model
- TOPIC 2: PHYSICAL LEVEL: Synchronous and asynchronous transmission. Means of transmission. DTE/DCE interface
- TOPIC 3: LINK LEVEL: Link level functions. Flow control. Error control. HDLC protocol
- TOPIC 4: LOCAL AREA NETWORKS: Mechanisms of access to the environment. Ethernet. Interconnection devices in Ethernet networks. Virtual Local Area Networks (VLAN)
- TOPIC 5: NETWORK LEVEL: IPv4 protocol. Addressing. Auxiliary protocols: ICMP, ARP. Routing. IPv6 protocol.
- TOPIC 6: TRANSPORT LEVEL: Transportation Level Services. UDP protocol. TCP protocol. Network Address Translation

4. Academic activities

The methodology followed for the teaching-learning process that has been designed for this subject is based on :

- **Theoretical-practical classes** that allow transmitting knowledge to the students, encouraging their participation. In these classes, practical cases will be solved and theory will be taught without an explicit separation between the two

- **Personalized attention** both in small groups and individualized tutoring.
- Continued **study and personal work** by the student from the beginning of the term.
- **Assessment tests.**

5. Assessment system

FIRST CALL

Continuous assessment:

1. Midterm test on topics 1-4 of the subject (25% final grade). RA-1 and RA-2 are evaluated.
2. Midterm written test at the end of the term on topics 5 and 6 (35% final grade). RA-1 and RA-2 are evaluated.
3. Deliverable exercises of the contents of the subject (40% final grade). RA-1 and RA-2 are evaluated.

Global test:

Students who do not pass the subject by continuous evaluation or who would like to improve their grade, will have the right to take the overall test set in the academic calendar, prevailing, in any case, the best of the grades obtained. This global test will be equivalent to the continuous evaluation tests described above and will have a weight of 100% in the final grade.

SECOND CALL

Global test:

Students who do not pass the subject in the first exam may sit for a Global Test set in the academic calendar for the second exam. This global test will be equivalent to the continuous evaluation tests described above and will have a 100% weight in the final grade.

Assessment instruments:	Weighting	RA-1	RA-2
First midterm	25%	X	X
Second midterm	35%	X	X
Deliverables	40%	X	X