Course guide
320108 - FXT - Foundations of Telematic Networks

Unit in charge: Terrassa School of Industrial, Aerospace and Audiovisual Engineering
Teaching unit: 744 - ENTEL - Department of Network Engineering.

Degree: BACHELOR'S DEGREE IN AUDIOVISUAL SYSTEMS ENGINEERING (Syllabus 2009). (Compulsory subject).
Academic year: 2022  ECTS Credits: 6.0  Languages: Catalan, Spanish

LECTURER
Coordinating lecturer: JOSE LUIS MUÑOZ TAPIA
Others: JUAN JOSE ALINS DELGADO

DEGREE COMPETENCES TO WHICH THE SUBJECT CONTRIBUTES

Specific:
1. AUD_COMMON: Ability to analyse and specify the fundamental parameters of a communication system.

2. AUD_COMMON: Ability to differentiate between the concepts underlying access and transport networks, circuit-switching and packet-switching networks, fixed and mobile networks and systems and applications for distributed networks and voice, data, audio, interactive and multimedia services.

3. AUD_COMMON: Understand the national, European and international standards and legislation governing telecommunications.

4. AUD_COMMON: Understand interconnecting and routing methods and basic planning and network-sizing approaches depending on traffic parameters.

Transversal:
5. EFFECTIVE USE OF INFORMATION RESOURCES - Level 2. Designing and executing a good strategy for advanced searches using specialized information resources, once the various parts of an academic document have been identified and bibliographical references provided. Choosing suitable information based on its relevance and quality.

TEACHING METHODOLOGY

The hours of directed learning they consist of making theoretical classes (big group) in which the teaching staff makes an exposure to introduce the goals of learning generals related with the basic concepts of the subject. Later and through practical exercises the teacher attempts to motivate and to involve the student so he/she participates actively. They also consist to teaching (medium group) in what from 3 to 4 members, through the resolution of exercises or problems in groups related with the goals to learning of each of the contents of the subject. It is also necessary to consider other hours of autonomous learning like those that dedicate themselves to the directed readings or the resolution of the problems proposed of the different contents through the virtual campus ATENEA.

LEARNING OBJECTIVES OF THE SUBJECT

By finishing the subject the student has to be capable of:
Understanding the concept of protocol of communication, service and layer.
Knowing the main architectures of protocols based on layers.
Understanding the basic concepts related with each of the layers of an architecture of protocols.
Knowing the particular operation of the architecture of protocols TCP/IP in what is based the Internet.
STUDY LOAD

<table>
<thead>
<tr>
<th>Type</th>
<th>Hours</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Self study</td>
<td>90,0</td>
<td>60.00</td>
</tr>
<tr>
<td>Hours large group</td>
<td>45,0</td>
<td>30.00</td>
</tr>
<tr>
<td>Hours small group</td>
<td>15,0</td>
<td>10.00</td>
</tr>
</tbody>
</table>

Total learning time: 150 h

CONTENTS

TOPIC 1: Introduction to telematic networks

Description:
Parts of a network.
Transmission media.
Switching modes.
Switching, addressing and routing.
Multiplexing and encapsulation.
Flow and congestion control.
Protocol architectures and the OSI reference model.
Standards, legislation and regulatory bodies.

Related activities:
Problem-based lectures
Activity 1. Mid-semester test
Activity 2. End-of-semester test

Full-or-part-time: 35h
Theory classes: 9h
Practical classes: 4h
Self study: 22h

TOPIC 2: The link level

Description:
Asynchronous and synchronous transmissions
Structure
Access mechanisms for shared media
Ethernet and switched networks

Related activities:
Problem-based lectures
Activity 1. Mid-semester test
Activity 2. End-of-semester test

Full-or-part-time: 20h
Theory classes: 6h
Practical classes: 2h
Self study: 12h
TOPIC 3: The network level. IP

Description:
- Interconnected networks
- Address resolution at the link level (ARP)
- Addressing
- Subnetting/supernetting
- Static routing
- Fragmentation
- The IP datagram
- The control protocol (ICMP)
- Switching versus routing

Related activities:
- Problem-based lectures
- Activity 1. Mid-semester test
- Activity 2. End-of-semester test

Full-or-part-time: 37h
- Theory classes: 10h
- Practical classes: 4h
- Self study: 23h

TOPIC 4: Transport levels. TCP/UDP

Description:
- Communication between processes
- The client/server model
- Unreliable transport: UDP (user datagram protocol)
- Reliable transport: TCP (transport control protocol)
- Controlling transport flux, errors and congestion

Related activities:
- Problem-based lectures
- Activity 2. End-of-semester test

Full-or-part-time: 24h
- Theory classes: 7h
- Practical classes: 2h
- Self study: 15h

TOPIC 5: Additional Internet protocols and mechanisms

Description:
- Network address translation (NAT)
- Domain name system (DNS) translation
- Dynamic host configuration protocol (DHCP)

Related activities:
- Problem-based lectures
- Activity 2. End-of-semester test

Full-or-part-time: 19h
- Theory classes: 5h
- Practical classes: 2h
- Self study: 12h
TOPIC 6: World Wide Web

Description:
Fundamentals of HTML.
HTTP protocols: 1.0 and 1.1.
Dynamic applications.

Related activities:
Problem-based lectures
Activity 2. End-of-semester test

Full-or-part-time: 10h
Theory classes: 3h
Practical classes: 1h
Self study : 6h

ACTIVITIES

(ENG) PROVA PARCIAL (CONTINGUT 1, 2 I 3)

Full-or-part-time: 2h
Theory classes: 2h

(ENG) PROVA FINAL (CONTINGUT 1, 2, 3, 4, 5 I 6)

Full-or-part-time: 3h
Theory classes: 3h

GRADING SYSTEM

1st stage: partial control 25%
2a prova: laboratory control 25%
3a prova: final control 50%

If the end note is greater than the average of the notes of the individual controls, the note of the final control will be the final grade. For those students who meet the requirements and submit to the reevaluation examination, the grade of the reevaluation exam will replace the grades of all the on-site written evaluation acts (tests, midterm and final exams) and the grades obtained during the course for lab practices, works, projects and presentations will be kept.
If the final grade after reevaluation is lower than 5.0, it will replace the initial one only if it is higher. If the final grade after reevaluation is greater or equal to 5.0, the final grade of the subject will be pass 5.0.

BIBLIOGRAPHY

Basic:

Complementary: