Course guide
320113 - SAT - Telematic Applications and Services

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: JUAN JOSE ALINS DELGADO
Others: JOSE LUIS MUÑOZ TAPIA

DEGREE COMPETENCES TO WHICH THE SUBJECT CONTRIBUTES

Transversal:
1. SELF-DIRECTED LEARNING - Level 3. Applying the knowledge gained in completing a task according to its relevance and importance. Deciding how to carry out a task, the amount of time to be devoted to it and the most suitable information sources.
2. TEAMWORK - Level 3. Managing and making work groups effective. Resolving possible conflicts, valuing working with others, assessing the effectiveness of a team and presenting the final results.
3. EFFECTIVE USE OF INFORMATION RESOURCES - Level 3. Planning and using the information necessary for an academic assignment (a final thesis, for example) based on a critical appraisal of the information resources used.
4. EFFICIENT ORAL AND WRITTEN COMMUNICATION - Level 2. Using strategies for preparing and giving oral presentations. Writing texts and documents whose content is coherent, well structured and free of spelling and grammatical errors.

TEACHING METHODOLOGY

Face-to-face lecture sessions.
- Face-to-face practical work sessions.
- Face-to-face laboratory work sessions.
- Independent learning and exercises.
- Preparation and completion of group activities subject to assessment.

LEARNING OBJECTIVES OF THE SUBJECT

In this subject, students will gain an understanding of inter-process communications by means of telematic networks. We will cover the various communication architectures and take an in-depth look at the transport layer, as this is the interface with the applications. We also learn the concepts and tools for network programming. Another of the objectives of the subject is the analysis of networks, to do so, the analysis of data traffic through networks is studied, using packet capture tools.

STUDY LOAD

<table>
<thead>
<tr>
<th>Type</th>
<th>Hours</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hours large group</td>
<td>30,0</td>
<td>20.00</td>
</tr>
<tr>
<td>Self study</td>
<td>90,0</td>
<td>60.00</td>
</tr>
<tr>
<td>Hours small group</td>
<td>30,0</td>
<td>20.00</td>
</tr>
</tbody>
</table>

Total learning time: 150 h
## CONTENTS

### TOPIC 1: Inter-process communication

**Description:**
1.1. Client-server applications.
1.2. Input/output.
1.3. Pipes and signals.
1.4. Synchronisation between processes.
1.5. BSD Sockets

**Related activities:**
five two-hour practical sessions on communication between processes, using the Linux operating system.

**Full-or-part-time:** 50h
- Theory classes: 10h
- Laboratory classes: 10h
- Self study : 30h

### Transport Layer

**Description:**
2.1 UDP
2.2 TCP
2.2.1 Flow control. TCP sliding window.
2.2.2 TCP error control.
2.2.3 TCP congestion control.

**Related activities:**
Three two-hour practical sessions on TCP/UDP transmission, with analysis of losses.

**Full-or-part-time:** 26h
- Theory classes: 5h
- Laboratory classes: 6h
- Self study : 15h

### DNS - DHCP

**Description:**
2.1 DNS
2.1.1 Domains and Zones
2.1.2 Implementation
2.1.3 Request-Reply mechanism
2.1.3 DNS protocol
2.2 DHCP
2.2.1 Component and architecture
2.2.2 DHCP allocation mechanisms
2.2.3 DHCP Protocol
2.2.4 DHCP in Linux

**Full-or-part-time:** 24h
- Theory classes: 5h
- Laboratory classes: 4h
- Self study : 15h
TOPIC 4: Security services: Firewalls and NAT

Description:
4.1. Firewalls and packet filtering
4.2. Network address translation

Related activities:
three two-hour sessions on network structure configuration with DMZ including firewall and NAT.

Full-or-part-time: 34h
Theory classes: 7h
Laboratory classes: 6h
Self study: 21h

HTTP and HTML

Description:
5.1. HTTP
5.2. HTML

Full-or-part-time: 16h
Theory classes: 3h
Laboratory classes: 4h
Self study: 9h

GRADING SYSTEM

- First examination: 25%
- Second examination: 35%
- Laboratory: 40%

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: