320113 - SAT - Telematic Applications and Services

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.
3. 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.
4. 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.
2. 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.

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></th>
<th>Hours large group:</th>
<th>Hours medium group:</th>
<th>Hours small group:</th>
<th>Guided activities:</th>
<th>Self study:</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Total learning time:</strong></td>
<td>150h</td>
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<td>30h</td>
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<td>30h</td>
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</table>
### TOPIC 1: Inter-process communication

<table>
<thead>
<tr>
<th>Description:</th>
<th>Theory classes: 10h</th>
<th>Laboratory classes: 10h</th>
<th>Self study: 30h</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.1. Client-server applications.</td>
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<tr>
<td>1.2. Input/output.</td>
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<td>1.3. Pipes and signals.</td>
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<td>1.4. Synchronisation between processes.</td>
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<td>1.5. BSD Sockets</td>
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</table>

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

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### Transport Layer

<table>
<thead>
<tr>
<th>Description:</th>
<th>Theory classes: 5h</th>
<th>Laboratory classes: 6h</th>
<th>Self study: 15h</th>
</tr>
</thead>
<tbody>
<tr>
<td>2.1 UDP</td>
<td></td>
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<tr>
<td>2.2 TCP</td>
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<tr>
<td>2.2.1 Flow control. TCP sliding window.</td>
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<tr>
<td>2.2.2 TCP error control.</td>
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<tr>
<td>2.2.3 TCP congestion control.</td>
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</table>

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

#### Learning 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.

#### Learning time: 34h
- Theory classes: 7h
- Laboratory classes: 6h
- Self study: 21h

### HTTP and HTML

#### Description:
- **5.1. HTTP**
- **5.2. HTML**

#### Learning time: 16h
- Theory classes: 3h
- Laboratory classes: 4h
- Self study: 9h
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**Qualification 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:**