Course guide
230020 - AST - Network Applications and Services

Unit in charge: Barcelona School of Telecommunications Engineering
Teaching unit: 744 - ENTEL - Department of Network Engineering.
Degree: BACHELOR’S DEGREE IN TELECOMMUNICATIONS TECHNOLOGIES AND SERVICES ENGINEERING (Syllabus 2015). (Compulsory subject).

Academic year: 2022  ECTS Credits: 6.0  Languages: Catalan, Spanish

LECTURER

Coordinating lecturer: Consultar aquí / See here:
https://telecos.upc.edu/ca/estudis/curs-actual/professorat-responsables-coordinadors/responsables-assignatura

Others: Consultar aquí / See here:
https://telecos.upc.edu/ca/estudis/curs-actual/professorat-responsables-coordinadors/professorat-assignat-idioma

DEGREE COMPETENCES TO WHICH THE SUBJECT CONTRIBUTES

Generical:
12 CPE N2. They will be able to identify, formulate and solve engineering problems in the ICC field and will know how to develop a method for analysing and solving problems that is systematic, critical and creative.

TEACHING METHODOLOGY

Lectures
Laboratory sessions
Group work (non-classroom)
Individual work (non-classroom)
Homework exercises
Short tests (Control)
Conventional tests (Final exam)

LEARNING OBJECTIVES OF THE SUBJECT

To acquire a global perspective of the basic concepts involving Telematic applications and services. To identify the main concepts for the design of Telematic applications, basically those related to the programming of multithread systems for the nodes participating on the designed approach, and the programming of the communication among those threads executing on the distant nodes. To identify the features of the communication channel at the transport layer. To understand the control mechanisms for the transmitted data among the participating nodes assuring a given quality of service.
STUDY LOAD

<table>
<thead>
<tr>
<th>Type</th>
<th>Hours</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hours large group</td>
<td>39,0</td>
<td>26.00</td>
</tr>
<tr>
<td>Hours small group</td>
<td>26,0</td>
<td>17.33</td>
</tr>
<tr>
<td>Self study</td>
<td>85,0</td>
<td>56.67</td>
</tr>
</tbody>
</table>

Total learning time: 150 h

CONTENTS

Streams I/O

Description:
Learning of Java I/O streams

Full-or-part-time: 11h 32m
Theory classes: 3h
Laboratory classes: 2h
Self study: 6h 32m

Containers, stacks and queues

Description:
Java stacks and queues programming

Full-or-part-time: 23h 05m
Theory classes: 6h
Laboratory classes: 4h
Self study: 13h 05m

Threads

Description:
Threads in Java

Full-or-part-time: 11h 32m
Theory classes: 3h
Laboratory classes: 2h
Self study: 6h 32m

Introduction to concurrency

Description:
Introduction to concurrency. Mutual exclusion problem

Full-or-part-time: 14h 32m
Theory classes: 6h
Laboratory classes: 2h
Self study: 6h 32m
### Monitors

**Description:**
Monitors: producers/consumers, readers/writers

**Full-or-part-time:** 11h 32m  
Theory classes: 3h  
Laboratory classes: 2h  
Self study: 6h 32m

### Message passing

**Description:**
Client/Server. Stub/Skeleton

**Full-or-part-time:** 23h 05m  
Theory classes: 6h  
Laboratory classes: 4h  
Self study: 13h 05m

### Implementation of transport protocols

**Description:**
Multiplexing/demultiplexing. Flow control. Connection/datagram oriented. Errors and losses

**Full-or-part-time:** 57h 42m  
Theory classes: 15h  
Laboratory classes: 10h  
Self study: 32h 42m

### ACTIVITIES

- (ENG) Exercicis
- (ENG) Proves de resposta curta (Control)
- (ENG) Pràctica de laboratori
- (ENG) Pràctica de laboratori
- (ENG) Pràctica de laboratori
- (ENG) Pràctica de laboratori
GRADING SYSTEM

Laboratory marks: 25%
Continuous assessment marks: 15%
Final exam marks: 60%

In this subject the following general competencies will be assessed:
- Third language (Medium Level)
- Experimentality and knowledge of instruments (Medium Level)

Reassessment:
75% of the grade corresponding to Theory can be re-evaluated.
25% of the grade corresponding to the laboratory is not re-evaluable.

BIBLIOGRAPHY

Basic:

Complementary: