Course guide
230020 - AST - Network Applications and Services

Last modified: 02/06/2023

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: 2023 **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
Conventional 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

Type	Hours	Percentage
Hours large group	39,0	26.00
Hours small group	26,0	17.33
Self study	85,0	56.67

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) Convetional test (Control)

Full-or-part-time: 1h 30m
Laboratory classes: 1h 30m

(ENG)Pràctica de laboratori

(ENG)Pràctica de laboratori

(ENG)Pràctica de laboratori

(ENG)Pràctica de laboratori

(ENG)Proves de resposta llarga (Examen Final)

GRADING SYSTEM

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

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:
- Kurose, J.F.; Ross, K.W. Computer networking: a top-down approach. 8th ed., global ed. Harlow, United Kingdom: Pearson Education Limited, 2022. ISBN 9781292405469.
- Comer, D.E. Internetworking with TCP/I P : vol.1 : principles, protocols and architecture. 6th ed. Upper Saddle River: Prentice-Hall International, 2014. ISBN 9780136085300.
- Coulouris, G.F. Distributed systems: concepts and design. 5th ed., int.ed. Harlow: Addison-Wesley/Pearson Education, 2012. ISBN 9780273760597.

Complementary:
- Andrews, G. R. Foundations of multithreaded, parallel, and distributed programming. Reading, Mass. [etc.], USA: Addison-Wesley, 2000. ISBN 0201357526.