30322 - Network and Service Programming

Información del Plan Docente

Academic Year	2016/17
Academic center	110 - Escuela de Ingeniería y Arquitectura
Degree	438 - Bachelor's Degree in Telecomunications Technology and Services Engineering 330 - Complementos de formación Máster/Doctorado
ECTS	6.0
Course	XX
Period	Second semester
Subject Type	ENG/Complementos de Formación, Compulsory
Module	---

1.Basic info

1.1.Recommendations to take this course

1.2.Activities and key dates for the course

2.Initiation

2.1.Learning outcomes that define the subject

2.2.Introduction

3.Context and competences

3.1.Goals

3.2.Context and meaning of the subject in the degree

3.3.Competences

3.4.Importance of learning outcomes

4.Evaluation

5.Activities and resources

5.1.General methodological presentation

It should be highlighted that the course was designed with both theoretical and practical approaches. Hence, the learning process essentially requires the students to attend the lectures and the practical laboratory lessons, to develop and implement computer programs of growing complexity, and to study individually.

5.2.Learning activities

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1. Instructors will introduce the contents of the course by means of lectures (25 teaching hours).
2. The resolution of practical problems in the classroom (5 teaching hours)
3. The development of practical exercises in the laboratory, with the guidance of instructors and implementing theoretical concepts studied in the lectures. (24 hours: 12 sesions of 2 hours each).
4. The design, elaboration, and implementation of practical assignments in groups, led by instructors.
5. The personal work by students.
6. The customized student support during office hours with the objective of revising and discussing materials and concepts introduced during the course.
7. The elaboration of written exams, based on theoretical and practical concepts and the submission of theoretical and practical assignments and reports. All of them will be used for the assessment of the students' progress. More details can be found in the Evaluation section.

5.3.Program

- **Programación Concurrente**

❍ Introduction to Concurrency

❍ Motivation

❍ Mutual Exclusion and Synchronisation Concepts

❍ Properties of Concurrent Programs: safety, liveness, and priority

❍ Concepts of Process & Thread

❍ Inter-process Synchronisation Mechanisms

❍ Mutual Exclusion Algorithms

❍ Semaphores

❍ Monitors

❍ Mutual and Partial Exclusion Problems

- **Distributed Systems**

❍ Introduction to Distributed Systems

❍ Software Archirectures

❍ Communication Networks: TCP/IP Architecture

❍ Process to Process Communication: Interface Socket TCP & UDP

❍ Channels and Asynchronous and Synchronous Message-Passing

❍ Client-Server Applications: Stateful and statless server

❍ Introduction to Middleware Technologies

5.4.Planning and scheduling

The scheduling of the course is defined by the School every academic year.

5.5.Bibliography and recomended resources

- Downey, Allen B . The Little Book of SEMAPHORES : The Ins and Outs of Concurrency Control and Common Mistakes / Allen B. Downey. 2nd ed. CreateSpace Independent Publishing Platform, 2009
- Ben-Ari, M.. Principles of concurrent and distributed programming / M. Ben-Ari. - 2nd ed. Harlow (England): Pearson Education, 2006
- Varela, Carlos. Programming Distributed Computing Systems: Foundational Approach / Carlos Varela The Mit Press, 2013
- Calvert, K.L . TPC/IP Sockets in Java: Practical Guide for Programmers / K. L. Calvert, M. J. Donahoo. - 2nd ed. Morgan Kaufmann Publishers, 2008
- Raynal, Michel. Distributed Algorithms for Message-Passing Systems / Michel Raynal Springer, 2013
- Tanenbaum, Andrew Stuart. Distributed systems : principles and paradigms / Andrew S. Tanenbaum, Maarten Van Steen . - 2nd ed. Upper Saddle River, NJ: Pearson Educación, cop. 2007

Slides, practical problems descriptions, case studies and practical assignments.

They can all be found at http://add.unizar.es