Course guide
230047 - DAT - Network Application Design

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). (Optional subject).

Academic year: 2024   **ECTS Credits:** 6.0   **Languages:** Catalan

LECTURER

Coordinating lecturer:	JUAN LUIS GORRICHO MORENO
Others:	Primer quadrimestre:
	JOSEP COTRINA NAVAU - 21
	MARCEL FERNANDEZ MUÑOZ - 21
	Segon quadrimestre:
	JORDI FORGA ALBERICH - 51

PRIOR SKILLS

Being familiar with the use of programming languages.

DEGREE COMPETENCES TO WHICH THE SUBJECT CONTRIBUTES

Generical:
2. They will have acquired knowledge related to experiments and laboratory instruments and will be competent in a laboratory environment in the ICC field. They will know how to use the instruments and tools of telecommunications and electronic engineering and how to interpret manuals and specifications. They will be able to evaluate the errors and limitations associated with simulation measures and results.

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.

TEACHING METHODOLOGY

LEARNING OBJECTIVES OF THE SUBJECT

The purpose of this subject is to instruct the student in the use of tools and the know-how for the design and implementation of telematic applications, more specifically, of web applications developed in Haskell, where the client accessing the service is a conventional web browser.
The first half of the course is devoted to learn programming in Haskell. This is a pure functional programming language using a programming paradigm completely different from imperative languages, like Java or C/C++. This is something which increases the difficulty to learn this particular programming language, until a given knowledge of the language has been reached.
The second half of the course is devoted to the design of web applications, focusing on the design of service architectures for the management of dynamic content, abstracting the presentation layer from the content layer or the application logic. To this end, labelling technologies like XML will be used, promoting the splitting of the layers. Complementary, different classical design patterns used in web applications will be taught, like the MVC (model-view-controller) and the DAO (Data Access Object).

Learning outcomes:

- The capacity to construct, exploit and manage telecommunication networks, services, processes and applications under a telematic perspective.
- An easy use of tools for the construction, exploitation and management of telematic services, in particular, those related to the Internet, web and multi-media content.
- Getting familiar with communication protocols and interfaces at the different layers of the network architecture, and to be able to describe, program, validate and optimise them.
- To be able to design client-server and P2P architectures, and to customise operating systems and virtual machines.
- The capacity for planning and use the necessary information to carry out any academic work, based on a critical thought of the considered sources of information.
- To apply the learned competencies to be able to develop an autonomous work. Identifying, when necessary, the need of a continuous learning, and to carry out a self-strategy to achieve that goal.

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

Unit 1. Telematic services.

Description:
client/server architecture.
Protocols at application layer: HTTP, HTTPS, URL, MIME, HTML.
HTTP Clients, features.
HTTP Servers, features.

Full-or-part-time: 22h 40m
Theory classes: 6h
Laboratory classes: 4h
Self study : 12h 40m

Unit 2. Technologies for conventional HTTP servers.

Description:
Programming CGIs.
Java servers: servlets containers, web applications set up, programming of web applications, APIs Servlets.

Full-or-part-time: 40h 30m
Theory classes: 10h 30m
Laboratory classes: 7h
Self study : 23h

Unit 3. Architectures for the design of telematic applications.

Description:
the Model-View-Controller pattern.
Persistence: the Data Access Object pattern, managing data base connections, transactions.

Full-or-part-time: 40h 30m
Theory classes: 10h 30m
Laboratory classes: 7h
Self study : 23h

Unit 4. Tools for dynamic content presentation.

Description:
Java Server Pages and equivalent.

Full-or-part-time: 22h 40m
Theory classes: 6h
Laboratory classes: 4h
Self study : 12h 40m

Unit 5. Technologies based in XML.

Description:
Introduction to XML: sintax, name spaces and XML schemes.
General tools for processing XML: parsers, verifiers, XSL transformations.

Full-or-part-time: 22h 40m
Theory classes: 6h
Laboratory classes: 4h
Self study : 12h 40m

ACTIVITIES

Programming exercise

Description:
Unit 1. Telematic services

Full-or-part-time: 1h
Theory classes: 1h

Programming exercise

Description:
Unit 2. Programming with CGIs.

Full-or-part-time: 1h
Theory classes: 1h

Programming exercise

Description:
Unit 3. The MVC pattern.

Full-or-part-time: 1h
Theory classes: 1h

Programming exercise

Description:
Unit 4. Java Server Pages.

Full-or-part-time: 1h
Theory classes: 1h

Programming exercise

Description:
Unit 5. XML technologies.

Full-or-part-time: 1h
Theory classes: 1h

GRADING SYSTEM

BIBLIOGRAPHY

Basic:
- Rodríguez de la Fuente, S. [et al.]. Programación de aplicaciones web. Madrid: International Thomson, 2003. ISBN 8497321812.
- Shklar, L.; Rosen, R. Web application architecture: principles, protocols and practices. 2nd ed. Chichester: John Wiley, 2009. ISBN 9780470518601.

Complementary:
- Kappel, G. [et al.] (eds.). Web engineering: the discipline of systematic development of web applications. Hoboken, NJ: John Wiley & Sons, 2006. ISBN 0470015543.