# Course guide
# 230718 - WMAD - Web and Mobile App Development

**Last modified:** 06/05/2025

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| **Unit in charge:** | Barcelona School of Telecommunications Engineering |
| **Teaching unit:** | 744 - ENTEL - Department of Network Engineering. |

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| **Degree:** | MASTER'S DEGREE IN TELECOMMUNICATIONS ENGINEERING (Syllabus 2013). (Optional subject). MASTER'S DEGREE IN ADVANCED TELECOMMUNICATION TECHNOLOGIES (Syllabus 2019). (Optional subject). |

**Academic year:** 2025    **ECTS Credits:** 5.0    **Languages:** English

## LECTURER

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| **Coordinating lecturer:** | JUAN LUIS GORRICHO MORENO |
| **Others:** | Primer quadrimestre: JUAN LUIS GORRICHO MORENO - 11 |

## PRIOR SKILLS

Basic knowledge of programming in Java

## DEGREE COMPETENCES TO WHICH THE SUBJECT CONTRIBUTES

**Specific:**
CE6. Ability to model, design, implement, manage, operate, administrate and maintain networks, services and contents
CE8. Ability to understand and to know how to apply the functioning and organization of the Internet, new generation Internet technologies and protocols, component models, middleware and services

**Transversal:**
CT4. EFFECTIVE USE OF INFORMATION RESOURCES: Managing the acquisition, structuring, analysis and display of data and information in the chosen area of specialisation and critically assessing the results obtained.

CT5. FOREIGN LANGUAGE: Achieving a level of spoken and written proficiency in a foreign language, preferably English, that meets the needs of the profession and the labour market.

## TEACHING METHODOLOGY

- Lectures.
- Laboratory sessions.
- Individual work at home (homework).

## LEARNING OBJECTIVES OF THE SUBJECT

Learning objectives of the subject:
The aim of this course is to give the student a practical overview of the main tools used for the programming of classical web applications, interactive web applications (social networking applications) and mobile applications. In order to achieve this goal the student will learn how to use the basic programming tools of the Internet technologies, those tools will include different techniques for the programming of HTTP connections as RESTful Web Services or WebSockets, the programming with Servlets and the programming using the Android platform. Complementary, the student will learn the programming to access to relational data bases in order to implement the persistence of, for instance, a social networking service.
The scope of the course is mainly practical, most of the time the student will be working on the programming of a sequence of specific exercises according to the concepts introduced by the different units composing the content of the course.
Learning results of the subject:

- The skills for the programming of classical web applications, interactive applications (social networking applications) and mobile applications.
- The skills to be able to design and implement the presently known as social networking services like: Twitter, Facebook or WhatsApp.

## STUDY LOAD

| Type | Hours | Percentage |
|------|-------|------------|
| Self study | 86,0 | 68.80 |
| Hours large group | 26,0 | 20.80 |
| Hours small group | 13,0 | 10.40 |

**Total learning time:** 125 h

## CONTENTS

### 1. Introduction

**Description:**
Introduction to distributed programming and to the web technologies. Fundamentals of the HTTP protocol.

**Full-or-part-time:** 7h
Theory classes: 2h
Laboratory classes: 1h
Self study : 4h

### 2. Web applications

**Description:**
Programming web applications with Servlets.
Programming the access to data bases.
Design of web applications based on the Model-View-Controller pattern.

**Full-or-part-time:** 21h
Theory classes: 6h
Laboratory classes: 3h
Self study : 12h

## 3. Interactive applications

**Description:**
Programming blackboard applications.
Programming with RESTful services.
Programming instant messaging applications.
The publisher-subscriber pattern.
Programming with WebSockets.

**Full-or-part-time:** 35h
Theory classes: 10h
Laboratory classes: 5h
Self study : 20h

## 4. Mobile applications

**Description:**
Fundamentals of programming with Android: the user interface, the multi-thread approach, programming the communication with the server, broadcast receivers, services, the push service.

**Full-or-part-time:** 35h
Theory classes: 10h
Laboratory classes: 5h
Self study : 20h

## GRADING SYSTEM

The student will be assessed with the marking of 4 basic programming exercises, those exercises are devoted to the three main units encompassing the content of the subject.
The student will work on those exercises during the laboratory sessions, but he/she will have to devote some extra time to finish their programming at home.
The weights of those exercises will be: 1st exercise: 25%, 2nd exercise: 25%, 3rd exercise: 25% and 4th exercise: 25% of the final marks.

## BIBLIOGRAPHY

**Basic:**
- Tanenbaum, A.S.; Steen, M.van. Distributed systems: principles and paradigms. 2nd ed. Upper Saddle River, NJ: Pearson Prentice Hall, 2007. ISBN 0136135536.
- Coulouris, G.F. Distributed systems: concepts and design. 5th ed., int. ed. Harlow: Addison-Wesley/Pearson Education, 2012. ISBN 9780273760597.