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**Academic Year: ( 2024 / 2025 )****Review date: 13-03-2024**

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**Department assigned to the subject: Telematic Engineering Department****Coordinating teacher: ALARIO HOYOS, CARLOS****Type: Compulsory ECTS Credits : 6.0****Year : 1 Semester : 2**

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## REQUIREMENTS (SUBJECTS THAT ARE ASSUMED TO BE KNOWN)

The course prerequisites are the following:

- Programming
- JAVA Programming Language
- Techniques for oral and written communication
- Basic knowledge about TCP/IP protocol
- Basic knowledge about HTTP protocol
- Basic knowledge about security

## OBJECTIVES

In this course, the following competences are reinforced:

- Knowledge and understanding that provide a basis or opportunity for originality in developing and/or applying ideas, often in a research context
- Students can apply the acquired knowledge and their capacity to solve problems in new or unfamiliar environments within broader contexts (or multidisciplinary) related to their field of study
- Students acquire the learning abilities that enable them to continue studying in a self-regulated and autonomous learning way
- Ability to project, calculate and design products, processes and installations in all the contexts of Telecommunication Engineering
- Ability for mathematical modeling, calculation and simulation in technological centres and enterprise engineering, specifically in research, development and innovation tasks in all the contexts related to Telecommunication Engineering and related multidisciplinary fields
- Ability to apply the acquired knowledge and solve problems in new or unusual environments in broader and multidisciplinary contexts, with the ability to integrate knowledge.
- Ability for the continuous, autonomous and self-regulated learning
- Ability to model, design, implement, manage, operate, manage and maintain networks, services and contents
- Ability to make the scheduling, decision making and packaging of services and applications considering the direct and operational costs, the implementation plan, supervision, security procedures, scaling and maintainment, as well as to manage and assure the quality in the development process
- Ability to understand and know how to apply the functioning and organization of Internet, the new generation Internet technology and protocols, the component based models, intermediary software and services

The learning outcomes that students achieve in this subject are the following:

- Create a software requirements specification from the requirements given by a user.
- Ability to project telematic applications through modeling using UML diagrams and Web modeling.
- Ability to design data models for telematic applications.
- Ability to design and implement telematic applications using the Web, such as applications for information search, electronic commerce, users management, content management, etc.
- Program applications that can make use of methods that are on remote machines, performing distributed computing.

## DESCRIPTION OF CONTENTS: PROGRAMME

In a generic way, the course contents include the following topics:

- Understanding and practical use of different telematics protocols
- Design of systems, services and applications focused on communications
- Requirement specification
- Modeling of telematics applications
- Data management including users and contents
- Business logic
- Interface
- Scalability
- Introduction to web services and distributed computing

In a more specific way, such generic contents are acquired using a collection of specific modelings, technologies and methodologies, which are divided into three blocks:

### I. Modeling of telematic applications

- Requirement specification
- Modeling of software applications
- Modeling of web applications

### II. Basic telematic applications technologies. These are low level technologies from which telematic applications can be built.

- Data (including content and users) and meta-data
  - o Data bases, SQL, JDBC
  - o XML and meta-data
- Business logic and presentation
  - o JEE
  - o HTML5, Javascript and AJAX
- Introduction to web services and distributed computing, REST API

### III. Introduction to Platforms for holding telematic applications

## LEARNING ACTIVITIES AND METHODOLOGY

Formative activities include:

- Theoretical sessions. In traditional class sessions
- Lab sessions. Using computers.
- Tutorial sessions.
- Work of the student individually or in group.

The teaching methodology to be used includes the following:

- Lectures of the teachers with the support of audiovisual and informatics media, aimed at teaching the main concepts and including complementary bibliography.
- Resolution of practical assignments, problems, etc. proposed by teachers.
- Work on assignments and reports.

## ASSESSMENT SYSTEM

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|---|----|
| <b>% end-of-term-examination:</b>   | 60 |
| <b>% of continuous assessment (assignments, laboratory, practicals...):</b> | 40 |

The evaluation will assess the level of achievement of the learning objectives based on the students outcomes.

1) First opportunity evaluation, the calculation of the grade will be obtained in the following way for students who follow the continuous evaluation:

- 40 % Practical student assignments during the course.
- 60 % Final exam of the course, including all course contents. It is required a minimum grade of 4 (in a scale of 10 points) in the final exam to pass the course and a minimum grade of 5 for the continuous

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|---|----|
| <b>% end-of-term-examination:</b>   | 60 |
| <b>% of continuous assessment (assignments, laboratory, practicals...):</b> | 40 |

evaluation.

For students who do not follow the continuous evaluation, the final exam will have a weight of 60%.

2) Second opportunity evaluation, the calculation of the grade will be as follows:

For those students who fail the course in the first opportunity, they will have a second opportunity. If the student followed the continuous evaluation, the final course exam of the second opportunity will have the same percentage value of 60% as in the first opportunity, and the final course grade will consider the grade of the continuous evaluation and the grade obtained in the final exam. Therefore, students who follow the continuous evaluation have the same weight distribution of percentages of the different assessments in the first opportunity and the second opportunity.

If the student has not followed the continuous evaluation, the final course exam of the second opportunity will constitute 100 % of their grades. In any case, in the second opportunity, for students who have followed the process of continuous evaluation, the best grade will be considered between both ways of evaluation.

#### BASIC BIBLIOGRAPHY

- D. Wolf, A.J. Henley Java EE Web Application Primer, Apress, 2017
- J. Murach, M. Urban Murach's Java Servlets and JSP, Murach, 2014

#### ADDITIONAL BIBLIOGRAPHY

- D. Chermetz The Java EE Course - build a Java EE app from scratch, <https://www.udemy.com/the-java-ee-course/>, 2019
- D. Sanderson Programming Google App Engine with Java Build & Run Scalable Java Applications on Google's Infrastructure, O'Reilly Media, 2015
- D. Stuttard, M. Pinto The web application hacker's handbook: Finding and exploiting security flaws. , John Wiley & Sons, 2011
- J. Manico, J., A. Detlefsen Iron-Clad Java: Building Secure Web Applications, McGraw-Hill Education Group, 2015
- R. Miles et K. Hamilton Learning UML 2.0 A Pragmatic Introduction to UML, O'Reilly Media, 2006
- S. Allamaraju RESTful Web Services Cookbook Solutions for Improving Scalability and Simplicity, O'Reilly Media / Yahoo Press, 2010
- S. Ceri, P. Fraternali, A. Bongio, M. Brambilla, S. Comai, and M. Matera Designing Data-Intensive Web Applications, Morgan Kaufmann, 2003