VNIVERSITAT DE VALÈNCIA

# Course Guide
# 44826 Distributed Component-Based and Service-Based Development

## COURSE DATA

| Data Subject | |
|---|---|
| **Code** | 44826 |
| **Name** | Distributed Component-Based and Service-Based Development |
| **Cycle** | Master's degree |
| **ECTS Credits** | 4.0 |
| **Academic year** | 2022 - 2023 |

**Study (s)**

| Degree | Center | Acad. year | Period |
|---|---|---|---|
| 2234 - M.D. in Web Technology, Cloud Computing and Mobile Apps | School of Engineering | 1 | Second term |

**Subject-matter**

| Degree | Subject-matter | Character |
|---|---|---|
| 2234 - M.D. in Web Technology, Cloud Computing and Mobile Apps | 2 - Server-Side Development | Obligatory |

**Coordination**

| Name | Department |
|---|---|
| GRIMALDO MORENO, FRANCISCO | 240 - Computer Science |

## SUMMARY

This course will introduce the student to the paradigm of web application development based on the integration of distributed components and services. This approach, which places special emphasis on code reuse, seeks to define and implement web systems as a result of the aggregation of independent and loosely coupled components, which allows to accelerate and optimize software development processes. To do this, an overview of the main component-oriented development platforms and frameworks in the web environment, the available technologies and their fields of application will be given.

## PREVIOUS KNOWLEDGE

### Relationship to other subjects of the same degree

There are no specified enrollment restrictions with other subjects of the curriculum.

### Other requirements

To successfully complete this course, it is recommended that students know the basic technologies for the development of web applications, both from the client and from the server side.

## OUTCOMES

### 2234 - M.D. in Web Technology, Cloud Computing and Mobile Apps

- Students should apply acquired knowledge to solve problems in unfamiliar contexts within their field of study, including multidisciplinary scenarios.
- Students should be able to integrate knowledge and address the complexity of making informed judgments based on incomplete or limited information, including reflections on the social and ethical responsibilities associated with the application of their knowledge and judgments.
- Students should communicate conclusions and underlying knowledge clearly and unambiguously to both specialized and non-specialized audiences.
- Students should demonstrate self-directed learning skills for continued academic growth.
- Students should possess and understand foundational knowledge that enables original thinking and research in the field.
- Ability to apply acquired knowledge and solve problems in new or little-known environments within broader and multidisciplinary contexts, being able to integrate this knowledge.
- To foster, in academic and professional contexts, technological, social or cultural advancement within a society based on In knowledge and respect for: a) fundamental rights and equal opportunities between men and women; b) principles of equal opportunities and universal accessibility of persons with disabilities; and, c) the values of a culture of peace and democratic values.
- Ability to model, design, define the architecture, implement, manage, operate, and maintain applications, systems, services, networks and content in the field of Web technologies, cloud computing and mobile applications.
- Ability to understand and apply the operation and organization of component models, intermediary software and services.
- Ability to design and evaluate servers, applications and systems based on distributed computing.

- Ability to design, develop and maintain Web applications using technologies and frameworks both in the client and in the server sides.

## LEARNING OUTCOMES

- Specify and complete computer tasks that are complex, incompletely defined or unfamiliar
- Describe and explain techniques and methods applicable to their particular area of study and identify their limitations
- Organize your own work independently, demonstrating initiative and exercising personal responsibility
- Perform bibliographic searches and reviews using databases and other sources of information
- Learning and improving personal performance as the basis for lifelong learning and professional development
- Communicate effectively both verbally and through other media to a variety of audiences and preferably in a second language
- Design and develop applications combining different technologies
- Design and develop distributed web computing architectures based on remote procedure calls.
- Design and develop distributed web computing architectures based on message oriented systems.
- Design and develop applications using frameworks on the server side
- Design and develop Web services
- Design and develop Rest services

## DESCRIPTION OF CONTENTS

### 1. Developing applications with the Spring framework + Spring Boot

### 2. Developing Web applications with Spring MVC + Spring Test

### 3. Developing REST APIs with Spring + Spring HATEOAS

### 4. Securing REST APIs with Spring Security

### 5. Development of message driven applications with JMS and Spring AMQP

### 6. Reactive programming with Spring WebFlux

### 7. Developing microservice oriented architectures in Spring Cloud

## WORKLOAD

| ACTIVITY | Hours | % To be attended |
|---|---|---|
| Theoretical and practical classes | 40,00 | 100 |
| Development of group work | 6,00 | 0 |
| Study and independent work | 35,00 | 0 |
| Preparation of practical classes and problem | 16,00 | 0 |
| Resolution of online questionnaires | 3,00 | 0 |
| **TOTAL** | **100,00** | |

## TEACHING METHODOLOGY

- Theory class
- Problem resolution
- Project-oriented learning

## EVALUATION

The assesment modalities used in this subject are:

SE1: Online assessment and/or degree of participation

SE2: Assessment of problems, works, reports and/or memories

SE4: Exam or face-to-face assessment

SE6: Assessment of laboratory

- First call:

Final grade = 0,1*SE1 + 0,3*SE2 + 0,2*SE4 + 0,4*SE6

- Second call:

Final grade = 0,1*SE1 + 0,3*SE2 + 0,2*SE4 + 0,4*SE6

The grading system is specified at the following link:

http://www.uv.es/uvweb/universidad/es/estudios-postgrado/informacion-administrativa-postgrado/permanencia-calificaciones/calificaciones-1285897761928.html

The applicable regulations can be found at the following link:

http://www.uv.es/uvweb/universidad/es/estudios-grado/informacion-academica-administrativa/normativas/normativas-universidad-valencia-1285850677111.html

## REFERENCES

### Basic

- Beginning Spring Boot 2: Applications and Microservices with the Spring Framework. K. Siva Prasad Reddy (http://dx.doi.org/10.1007/978-1-4842-2931-6)
- Pro Spring Boot 2 An Authoritative Guide to Building Microservices, Web and Enterprise Applications, and Best Practices. Gutierrez, Felipe. Apress.

### Additional

- Spring Framework Official site. http://www.spring.io
- Pro Spring 5: An In-Depth Guide to the Spring Framework and Its Tools. Iuliana Cosmina, Rob Harrop, Chris Schaefer, Clarence Ho (http://dx.doi.org/10.1007/978-1-4842-2808-1)
- Spring 5 Recipes: A Problem-Solution Approach. Marten Deinum, Daniel Rubio, Josh Long (http://dx.doi.org/10.1007/978-1-4842-2790-9)