COURSE DATA

Data Subject

Code	44825
Name	Server-Side Programming
Cycle	Master's degree
ECTS Credits	4.0
Academic year	2022 - 2023

Study (s)

Degree	Center	Acad. year	Period
2234 - Master's Degree in Web Technology, Cloud Computing and Mobile Applications	School of Engineering	1	First term

Subject-matter

Degree	Subject-matter	Character
2234 - Master's Degree in Web Technology, Cloud Computing and Mobile Applications	2 - Server-Side Development	Obligatory

Coordination

Name	Department
GUTIERREZ AGUADO, JUAN	240 - Computer Science
PEÑA ORTIZ, RAÚL	240 - Computer Science

SUMMARY

This subject explores some relevant APIs that allow a solvent development of applications on the server side. Specifically, it deepens the concurrency since it allows to exploit properly the multiprocessor systems; on the other hand presents the introspection that is a key piece to understand how you can manage the life cycle of the components and achieve the injection of dependencies through annotations; distributed applications will be reviewed with special emphasis on those based on message queues; the structure of the application servers will be displayed; it will be reviewed part of the API that allows us to develop services through Java Servlets (filters, session and multipart) and to develop WebSockets (that allows us to have a channel of communication bidirectional between the clients and the server). Finally, the Python Django framework will be reviewed.

VNIVERSITAT Ð̵ VALÈNCIA

PREVIOUS KNOWLEDGE

Relationship to other subjects of the same degree

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

Other requirements

Programming skills using the Java language and knowledge of communication protocols over TCP / IP.

COMPETENCES (RD 1393/2007) // LEARNING OUTCOMES (RD 822/2021)

2234 - Master's Degree in Web Technology, Cloud Computing and Mobile Applications

- 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 (RD 1393/2007) // NO CONTENT (RD 822/2021)

- 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 that execute tasks concurrently on sets of threads

- Develop applications that use introspection

- Declare annotations and know how they are processed through introspection to develop frameworks

- Design and develop applications distributed over different protocols

- Design and develop distributed applications using object distribution middleware

- Design and develop applications distributed through message passing using advanced queuing systems

- Know the structure of the application servers

- Know and use the Java Servlets API and Python Django framework to develop services

- Understand and use the WebSockets API to develop applications

DESCRIPTION OF CONTENTS

1. Standards for Java-based enterprise application development

2. Execution of concurrent tasks on sets of threads

Classes of the java.util.concurrent package that allow the execution of tasks on sets of threads and different mechanisms for the synchronization of tasks will be reviewed.

3. Introspection and annotations

The reflection API will be reviewed and its use to generate code and process the annotations will be shown.

4. Distributed applications using messages

The AMPQ protocol and the different possibilities that RabbitMQ offers when sending and consuming messages will be reviewed.

5. Developing web applications using J2EE

The REST API concept and its architectural approach will be introduced using the main components of J2EE.

6. Developing web applications using Django

The model-view-control (MVC) software pattern design will be introduced to develop web applications using the Django framework (Python). Moreover, the framework will be used to implement REST APIs.

7. Websockets

The concept of websocket will be presented contrasting the J2EE and Django channels approaches.

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:
In the first call the note will be obtained as follows:

SE1*0.2+SE2*0.3+SE6*0.3+SE4*0.2

- Second call:

The works/reports/memories/code not delivered in the first call must be presented, there will be an in person evaluation session. The weights will be the same as those of the first call.

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

- https://docs.oracle.com/javaee/7/tutorial/index.html

- Java 9 concurrency cookbook, González, Javier Fernández
  (trobes.uv.es)

- Learning RabbitMQ; Martin Toshev
  (trobes.uv.es)

- Servlet and JSP : a beginner's tutorial; Budi Kurniawan
  (disponible en trobes.uv.es)

Additional

- Tutoriales J2SE
  http://docs.oracle.com/javase/tutorial/

- Django Project: https://www.djangoproject.com