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COURSE DATA

Data Subject	
Code	43850
Name	Distributed systems and services
Cycle	Master's degree
ECTS Credits	5.0
Academic year	2022 - 2023

Study (s)			
Degree	**Center**	**Acad. year**	**Period**
2174 - M.U. en Ingeniería de Telecomunicación 13-V.2	School of Engineering	1	First term

Subject-matter		
Degree	**Subject-matter**	**Character**
2174 - M.U. en Ingeniería de Telecomunicación 13-V.2	4 - Distributed systems and services	Obligatory

Coordination	
Name	**Department**
SAMPER ZAPATER, JOSE JAVIER	240 - Computer Science

SUMMARY

The main objective of **Distributed Systems and Service** is to provide an integrated vision of the different aspects related to the distributed programming and the pervasive computing. SSD exposes the foundations of the design of distributed systems, the development of distributed applications based on Web Services and SOA (Service-Oriented Architectures). The main chapters covered by SSD in order to fulfill the previous objectives are: Foundations in the design of distributed systems, communication models between processes, Web Services, AJAX and REST, Cloud Computing, Java ME and Multi-agent systems.

PREVIOUS KNOWLEDGE

Relationship to other subjects of the same degree

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

Other requirements

No particular requirements, other those that grant access to the Master.

OUTCOMES

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- To have critical thinking capabilities to investigate independently and self-critically, and to search and utilize information for documenting ideas.

- To have the ability of standing up for fair criteria with rigor and arguments, reporting them publicly in a clear way and in a multilingual environment.

- To have the ability to participate in diffusion forums, journals, conferences, etc. and to work cooperatively and effectively in transnational teams.

- Students should apply acquired knowledge to solve problems in unfamiliar contexts within their field of study, including multidisciplinary scenarios.

- 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.

- Be able to access to information tools in other areas of knowledge and use them properly.

- To be able to assess the need to complete the scientific, historical, language, informatics, literature, ethics, social and human background in general, attending conferences, courses or doing complementary activities, self-assessing the contribution of these activities towards a comprehensive development.

- Ability to model, design, implement, manage and maintain networks, services and contents.

- Ability to understand the organization of the Internet, applying new-generation technologies and protocols, component models, intermediate software and services.

LEARNING OUTCOMES

The main contents of Distributed Systems and Services (SSD) are framed in two differentiated blocks: 1) Distributed Programming 2) Mobile and Ubiquitous Computing. The contents of such blocks are summarized as follows:

- Introduction to Distributed Programming
- Java technologies for the development and deployment of Web Services
- AJAX y REST Services
- Introduction to Cloud Computing

Next to the technical dimension, this subject also helps developing a number of social and working skills:

- Teamwork: collaboration, planning, leadership, negotiation, respect;
- Personal organization;
- Communication skills in English, both written and oral;

Initiation to research and development for academic and industrial purposes, respectively.

DESCRIPTION OF CONTENTS

1. Introduction to Distributed Programming

Distributed Component Models: RMI, CORBA, DCOM
Models based on Messages: XML-RPC, REST
Models based on services

2. Java technologies for the development and deployment of Web Services

Platform Java EE and Java SE.
JAVA Technologies for Web Services: JAX-WS, JAXP, JAXB, SAAJ, JAXR, etc.. Development process of a Web Service: Web Service client application. Composition, interoperability and security in Web Services

3. AJAX and REST Services

Principles of REST services. Services REST vs. SOAP Services.
JAVA Technologies for REST Services: JAX-RS. JAVA Frameworks.
Process of developing a REST Service: REST Service and client application.
Web 2.0 and AJAX. Introduction and fundamentals. Classical Web Apps. vs. Applications AJAX. AJAX basic technologies: XHTML, CSS and Javascript
Consuming REST services with AJAX

4. Development of mobile applications with Java ME

Basic Notions of Java Me.
Practical development of mobile applications.

5. Introduction to Cloud Computing

Cloud Computing. Introduction and basic concepts. Service delivery models: SaaS, PaaS and IaaS

WORKLOAD

ACTIVITY	Hours	% To be attended
Theory classes	23,00	100
Laboratory practices	13,00	100
Tutorials	8,00	100
Classroom practices	6,00	100
Development of individual work	25,00	0
Study and independent work	11,00	0
Preparing lectures	20,00	0
Preparation of practical classes and problem	19,00	0
TOTAL	**125,00**	

TEACHING METHODOLOGY

MD1.-(AF1)In the theoretical lectures, it will be developed the different chapters of the subject providing a complete and integrative vision, analysing with better level of details those key aspect with more complexity and fostering always the participation of the students.

MD2.- In the practical activities, it will be complimented the theoretical concepts with the aim to apply these basic concepts in practice. The idea is to complement the knowledge and experience acquired in the theoretical lecturer. In summary, these are the following activities (AF2):

- Classes with problems and Questions in classroom.
- Sessions about discussion and problem resolution and exercises previously done by the students.
- Lab practices

AF3.- Furthermore, the student may perform personal tasks (at home) over different subjects, searching bibliography and doing other learning activities focused on particular aspect of study. Also, they will be requested to prepare correctly the classes and exams. These tasks are individual tasks in order to foster the autonomous work of the student.

AF5.- (Individual or group). About tutorial activities, the aim is to orientate and solve any doubt which may appear during any of the actives along the complete course.

It will be used the e-learning platform of University of Valencia as support for the communication with the students. We will deliver all the course materials using this delivery method.

EVALUATION

Students can choose between two different assessments:

• Continuous assessment system

• Single assessment system.

Continuous assessment system (First & second call)

• Continuous Evaluation (SE3), based on the participation and the level of implication of the student in the learning process, taking in to account the regular assistance to the different assistant activities and the resolution of the different questions and problems exposed in classroom and also the regular delivery of the workload requested.

• Individual Exam (SE1), it is an exam or set of exams with both theoretical and practical questions and problems. .

• Practical Activities (SE2). They are don in the different labs and also encompasses the homework.

Final Mark SSD = 20% SE3 + 50% SE1 + 30% SE2

It is a must to have at least 40% over the maximum grade in SE1 and SE2 (4 points) in order to pass this part of the subject.

If a student is unable to attend the lectures, he/she should contact the lecturer to find an alternative grading method:

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Single assessment system

In this case, the rating will be calculated as 5**0% the grade obtained in a final exam and 50% the group or individual activity, problems etc. presented during the course**. This exam will include the contents of theoretical, problem and laboratory sessions; and will be held on the same date as the final exams for students following the continuous evaluation system.

In any case, the system of evaluation will be ruled by the established in the Regulation of Evaluation and Qualification of the University of Valencia for Degrees and Masters. (http://www.uv.es/graus/normatives/2017_108_Reglament_avaluacio_qualificacio.pdf).

REFERENCES

Basic

- Beginning Java ME platform. Ed. Steve Anglin, ISBN 978-1-4302-1061-0, 2010
- Computación distribuida. Fundamentos y aplicaciones. M. L. Liu. Addison-Wesley, 2004, 1ª edición
- Sistemas distribuidos. Conceptos y diseño G. Coulouris, J. Dollimore, T. Kindberg. Addison-Wesley, 2001, 3ª edición
- David A Chappell, Tyler Jewell. Java Web Services. ISBN: 0-596-00269-6, Editorial:O'Reilly Media, 2002
- AJAX, Rich Internet Applications, and Web Development For Programmers. P.J. Deitel, H.M. Deitel. Prentice Hall, 2008
- RESTful Java Web Services. J. Sandoval. Packt Publishing, 2009
- Introduction to Grid Computing, by Frederic Magoules, Jie Pan and Kiat-an Tan (2009, Hardcover). Publisher: CRC Pr I Llc , ISBN-10:1420074067 ISBN-13:9781420074062
- Cloud Computing Explained: Implementation Handbook for Enterprise. J. Rhoton. Recursive Press, 2009

Additional

- Agentes Software y Sistemas Multi-agente A. Mas. Pearson Educacion, 2005
- RESTful Web Services L. Richardson, S. Ruby. OReilly Media, 2007
- Java Technology and Web Services. http://java.sun.com/webservices/index.jsp
- Introducción a los Servicios Web en Java https://programacion.net/articulo/introduccion_a_los_servicios_web_en_java_190