



IDENTIFYING DATA

(*)Arquitecturas e servizos telemáticos

Subject	(*)Arquitecturas e servizos telemáticos			
Code	V05G300V01645			
Study programme	(*)Grao en Enxeñaría de Tecnoloxías de Telecomunicación			
Descriptors	ECTS Credits	Choose	Year	Quadmester
	6	Mandatory	3rd	2nd
Teaching language	Spanish			
Department				
Coordinator	Fernández Vilas, Ana			
Lecturers	Díaz Redondo, Rebeca Pilar Fernández Vilas, Ana			
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General description	This course focuses on the architectonic solutions for the design of telematic systems. More specifically, the course is oriented to scenarios based on services (service-oriented architectures) and the deployment SOA solutions by means of Web Services Technologies (WS-*). Taking the WS-* stack as our technological layout, the course looks through the description, discovery and invocation of services in an SOA. Finally, The course introduces models for composing services and transaction protocols in SOA (again using Web Services as deployment technology).			

Competencies

Code	
A3	CG3: The knowledge of basic subjects and technologies that capacitates the student to learn new methods and technologies, as well as to give him great versatility to confront and update to new situations
A4	CG4: The ability to solve problems with initiative, to make creative decisions and to communicate and transmit knowledge and skills, understanding the ethical and professional responsibility of the Technical Telecommunication Engineer activity.
A6	CG6: The aptitude to manage mandatory specifications, procedures and laws.
A38	CE29/TEL3 The ability to build, operate and manage computer services using planning, sizing and analytical tools
A41	CE32/TEL6 The ability to design networks and service architectures.

Learning aims

Expected results from this subject	Training and Learning Results
The ability to build, operate and manage computer services using planning, sizing and analytical tools	A38
The ability to design networks and service architectures	A41
The knowledge of basic subjects and technologies that capacitates the student to learn new methods and technologies, as well as to give him great versatility to confront and update to new situations	A3
The ability to solve problems with initiative, to make creative decisions and to communicate and transmit knowledge and skills, understanding the ethical and professional responsibility of the Technical Telecommunication Engineer activity.	A4
The aptitude to manage mandatory specifications, procedures and laws.	A6

Contents

Topic

Introduction	Client-server Model and interprocess communication. Message Middlewares. Web Services and SaaS. SOA : Roles, operations, layers. Business applications
Web Services	Basic SOA Basic with REST. API Styles for Web Services: RPC, messages and resources API. Stack of Web Services technologies.
Technological Basis	Review of XML. SOAP Protocol & Messages. WSDL: Description of Services. Services Discovery.
Designing Services	Design of Web Services. Web Service LifeCycle. Implementation Axis/TomCat.
Composing Services	Model of composition Orchestration and choreography Orchestration with WS-BPEL Description of choreography: WS-CDL
Transactions	Properties of transactions Mechanisms for Concurrency Control Distributed Transactions Transactions in Web Services: WS-Coordination, WS-Transaction

Planning

	Class hours	Hours outside the classroom	Total hours
Master Session	19	38	57
Practice in computer rooms	8	8	16
Troubleshooting and / or exercises	4	8	12
Workshops	2	4	6
Projects	2	28	30
Presentations / exhibitions	1	2	3
Short answer tests	2	4	6
Case studies / analysis of situations	0	4	4
Practical tests, real task execution and / or simulated.	2	4	6
Long answer tests and development	2	8	10

*The information in the planning table is for guidance only and does not take into account the heterogeneity of the students.

Methodologies

	Description
Master Session	Classes that will combine the exhibition of the concepts and small exercises. These will be resolved by the teacher or by the students individually and/or in groups. The aim is to boost the debate in the class and reinforce the acquisition of skills.
Practice in computer rooms	During all the course, the lab sessions will be devoted to the development of small prototypes that allow to materialise the fundamental concepts of the course.
Troubleshooting and / or exercises	In the laboratory or in the classroom, the professor will pose small challenges that will be resolved collectively so that the students can discuss about the underlying concepts and the different options.
Workshops	The workshops will be devoted to the discussion of real cases and to the follow-up of the project of the course.
Projects	The students, in groups, will develop a software system whose requirements will be established in the 9th week of the teaching period. The follow-up of the project will be carried out during the workshops.
Presentations / exhibitions	Each workgroup will justify in a oral presentation the adopted solution for the course project. The presentation will take place the last week of the teaching period.

Personalized attention

Methodologies	Description
Projects	During the second part of the course, the students (organised in groups) will tackle the design and implementation of a telematic system using the architectonic and technological principles of Web Services. Each group will be continuously guided (weekly) about the adopted solution (workshops of the course).

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Assessment		
	Description	Qualification
Projects	Each workgroup will deliver the course project during the penultimate week of the teaching period. The delivery will consist of the final design, the code and the documentation. It is mandatory that the code can be compiled and executed in the lab premises. The assement of the project will value to equal parts the project design and the correct operation of the implementation code under a testing.	15
Presentations / exhibitions	Each workgroup will justify in an oral presentation the solution adopted in his project. The presentation will take place the last week of the teaching period with the professors of the course.	5
Short answer tests	About the 6th week of the teaching period, each student will do and individual test which combines practical skills and short questions.	10
Case studies / analysis of situations	Students, in groups, will have to deliver the design of the project of the course (about the 10th week of the teaching period).	10
Practical tests, real task execution and / or simulated.	This test will take place the last week of the teaching period. Individually, each student will solve an exercise that show his/her skills in using the main technologies of the course in some practical context.	10
Long answer tests and development	Individual writing test will take place in the date indicated in the official calendar of exams. Books, class notes and other matrial will not be allowed during the exam.	50

Other comments on the Evaluation

The student can follow up an assesment model of continuous evaluation or can do a final exam.

CONTINUOUS EVALUATION

The CONTINUOUS EVALUATION consists in the assesment activities mentioned previously. The student can choose to follow up continuous evaluation in week 7, after the first assesment of the course. After that, workgroups are created in order to tackle the collaborative development the course project. From this moment, the final mark never will be "not taken" (incomplete).

The maximum mark for the activities in continuous evaluation is the following:

- Individual writing test (exam calendar): Máximum 5 points.
- Intermediate proof: Maximun 1 point.
- Project Design: Maximum 1 point.
- Activities related with the implementation of the project: Maximum 5 points. (It includes delivery of the project, presentation in group and individual practical test).

The student passes the course if he/she obtains at least 2 points in "Individual Wirting Test" and a total punctuation (sum of the assesment activities) upper to 5 points. The maximum note will be of 10 points.

FINAL EXAM

The evaluation by means of a FINAL EXAM will consist of the following parts (Tests will not be recoverable):

1. A writing exam (whose description coincides with 5th test of the continuous evaluation). The result of this exam will suppose a maximum of 5 points and a minimum punctuation of 2,5 points will be required.
2. The implementation of an individual project that will have to be delivered the last week of teaching. This will consist of the project design, the project implementation and the documentation. It is mandatory that the code can be compiled and executed in the lab premises. The assement of the project will value to equal parts the project design and the correct operation of the implementation code under a testing. The evaluation of this part represents until a maximum of 2 points.
3. A practical test in the lab, whose description coincides with the 4th test of continuous evaluation. The evaluation of this part represents until a maximum of 3 points and a minimum punctuation of 1,5 points will be required.

In any case, the course is considered passed if the student obtains the minimum qualifications both in the writing test and in the practical test; and the sum of all the parts is upper to 5 points.

EXAMINATION AT THE END OF THE COURSE

For the examination at the END OF THE COURSE, all the students will be assessed in the modality of final exam as it has been described previously.

Sources of information

BASIC BIBLIOGRAPHY

- [Web Services & SOA: Principles and Technology]. Michael Papazoglou. Pearson Education, 2012 . ISBN-10: 0273732161
- [Building Web Services with Java: Making Sense of XML, SOAP, WSDL, and UDDI].By Steve Graham, Doug Davis, Simeon Simeonov, Glen Daniels, Peter Brittenham, Yuichi Nakamura, Paul Fremantle, Dieter Koenig, Claudia Zentner. Sams, 2004. ISBN-10: 0-7686-6348-2.
- [Service-Oriented Architecture: A Field Guide to Integrating XML and Web Services]. Thomas Erl. Prentice Hall, 2004. *ISBN-10: 0131428985.

COMPLEMENTARY BIBLIOGRAPHY

- [Understanding Web Services: XML, WSDL, SOAP, and UDDI.]. Eric Newcomer. Addison-Wesley Professional; 1 edition, 2002. ISBN-10: 0201750813.
- [SOA Using Java Web Services. Mark D. Hansen. Prentice Hall, 2007. ISBN-10: 0130449687.
- [Distributed Systems: Concepts and Design (5th Edition)]. George F. Coulouris. Addison Wesley, 2011. ISBN-10: 0132143011.
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- [Service Design Patterns: Fundamental Design Solutions for SOAP/WSDL and RESTful Web Services]. Robert Daigneau. Addison-Wesley Professional; 1 edition, 2011. ISBN-10: 032154420X.
- [SOA in Practice: The Art of Distributed System Design (Theory in Practice)]. Nicolai M. Josuttis. O'Reilly Half; 1 edition , 2007. ISBN-10: 0596529554.
- [Principles of Transaction Processing, Second Edition]. Eric Newcomer. Morgan Kaufman; 2 edition , 2009. ISBN-10: 1558606238.
- [Service Oriented Architecture with Java: Using SOA and Web Services to build powerful Java applications]. Binildas To. Christudas. Packt Publishing, 2008) . ISBN-10: 1847193218.
- [Applied SOA: Service-Oriented Architecture and Design Strategies]. Michael Rosen .Wiley; 1 edition , 2008. ISBN-10: 0470223650.
- [SOA Principles of Service Design]. Thomas Erl. Prentice Hall; 1 edition, 2007. ISBN-10: 0132344823.
- Service-Oriented Architecture (SOA): Concepts, Technology, and Design]. Thomas Erl. Prentice Hall, 2005. ISBN-10: 0131858580
- [Programming the World Wide Web (6th Edition)]. Robert W. Sebesta . Addison Wesley; 6 edition, 2010. ISBN-10: 0132130815.
- Internet & World Wide Web: How to Program (4th Edition)". P.J. Deitel. Prentice Hall; 4 edition, 2007). ISBN-10: 0131752421.

Recommendations

Subjects that are recommended to be taken simultaneously

(*)Programación concurrente e distribuída/V05G300V01641

(*)Sistemas de información/V05G300V01644

Subjects that it is recommended to have taken before

(*)Servizos de internet/V05G300V01501