Universida_de_Vigo

IDENTIFYING DATA
Architectures and Services

Subject	Architectures and Services
Code	V05G300V01645
Study programme	Degree in Telecommunications Technologies Engineering

Descriptors	ECTS Credits	Choose	Year	Quadmester
	6	Optional	3rd	2nd

Teaching language	Spanish
Department	
Coordinator	Fernández Vilas, Ana
Lecturers	Díaz Redondo, Rebeca Pilar Fernández Vilas, Ana
E-mail	avilas@det.uvigo.es
Web	http://faitic.uvigo.es
General description	This course focuses on the architectonic solutions for the design of distributed systems. More specifically, the course is oriented to sscenarios based on services (service-oriented architectures) and the deploymen SOA solutions by means of Web Services Technologies (WS-*). Taking the WS-* stack as our techonologcal layout, the course lokks through the description, discovery and invocation of services in an SOA. Finally, The course introduces models for services composition in SOA (again using Web Services as deployment technology).

Competencies

Code	
B3	CG3: The knowledge of basic subjects and technologies that enables the student to learn new methods and technologies, as well as to give him great versatility to confront and adapt to new situations
B4	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.
B6	CG6: The aptitude to manage mandatory specifications, procedures and laws.
C29	CE29/TEL3 The ability to build, operate and manage computer services using planning, sizing and analytical tools
C32	CE32/TEL6 The ability to design networks and service architectures.
D2	CT2 Understanding Engineering within a framework of sustainable development.
D3	CT3 Awareness of the need for long-life training and continuous quality improvement, showing a flexible, open and ethical attitude toward different opinions and situations, particularly on non-discrimination based on sex, race or religion, as well as respect for fundamental rights, accessibility, etc.

Learning outcomes

Expected results from this subject	Training and Learning Results		
To know the main architectures for telematic services of medium & high complexity.	B3 B6	C29 C32	D2 D3
To Understand the concept of middleware as a supporting element for services, and to know the main models used today.	B3	C29 C32	
To understand the importance and utility of web services for the development of telematic services.	B6	C29 C32	
To know the main technologies to build complex services by combining other services.	B6	C29 C32	
To master the basic concepts and technologies associated with the management of services and their security.	B3	C29 C32	
To Acquire skills to build complex telematic services.	B4		D2 D3

Contents

Topic	
Introduction	☐ Distributed Systems. ☐ Client-server Model: RPC. ☐ Message Middlewares. ☐ Web Services and SaaS. ☐ SOA : Roles, operations, layers.
Web Services	☐ Simple SOA with REST. ☐ API Styles for Web Services. ☐ RPC, messages and resources APIs. ☐ 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 Axis2.
Composing Services	☐ Model of composition ☐ Orchestration and choreography ☐ Orchestration with WS-BPEL ☐ Description of choreography: WS-CDL
Addressing services	☐ Introduction to WS-Addressing. ☐ Routing SOAP messages ☐ Notification services.

Planning

	Class hours	Hours outside the classroom	Total hours
Master Session	19	38	57
Practice in computer rooms	10	20	30
Troubleshooting and / or exercises	3	6	9
Projects	2	22	24
Presentations / exhibitions	2	8	10
Practical tests, real task execution and / or simulated.	4	8	12
Long answer tests and development	2	6	8

*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 teachervor by the students individually and/or in groups. The aim is to boost the debate in the class and reinforce the acquisition of skills. COMPETENCES: CG3, CE29, CE32
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. COMPETENCES: CG4, CG6
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 abouth the underlying concepts and the different options. COMPETENCES: CG3, CG4.
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. COMPETENCES: CE29, CE32, CT2, CT3
Presentations / exhibitions	Each workhroup 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. COMPETENCES: CG4, CT2, CT3

Personalized attention

Methodologies	Description

| | Projects | The students, organized in groups, develop a project that addresses the design and implementation of a distributed service-oriented architecture. Personalized attention related to these projects will take place in the sessions type C in the course. In each session of personalized attention, groups would discuss with the teacher the following questions concerning the progress of the project: what work has been addressed since the previous meeting? What problems have been found? What problems have not been solved? and what is the planning of future work? |

Assessment

	Description	Qualification	Training and Learning Results		
Projects	Each workgroup will deliver the course project during the penultimate week of the teaching period. The delivery will consist of the design, implementation and documentation. After delivering the project, a practical test will be performed (last week of the course) on the project implemented by each of the groups .	20	B4 B6	C32	D2 D3
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.	10	B4		D2 D3
Practical tests, real task execution and / or simulated.	One individual practical tests will be made in Week 5 of the teaching period. Each student will carry out an exercise to demonstrate competence in the use of course technologies in a practical setting .	10	B6	C29	
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.	60	B3	C29 C32	

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 6, after the first assessment 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:

1. Individual writing test: Official calendar (Maximum 6 points).
2. Intermediate Tests: Practical Tests (Maximun 1 point).
3. Project: Design, implementation and deployment (Maximum 3 points).

The project is done in groups and the score (maximum 3 points) is distributed as follows. The work of the group will contribute a maximum of 2 points and will be assessed on the size and quality of the project done. Individual contribution to group work is assessed by an interview with each of the students, who will assess the depth of knowledge of the student on the entire project.

The student passes the course if he/she obtains at least 2 points of 6 in "Individual Wirting Test"(1); a minimum of 1 point in the other sections (2 and 3); and a total score (sum of the assessment activities) equal or upper to 5 points. The maximum score is 10 points.

FINAL EXAM

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

1. Writing Test: Maximum of 6 points. A minimum punctuation of 2 points will be required.
2. Individual Project: Delivered during the last week of teaching. It will include design, implementation and documentation. The maximum score is 2 points.
3. Practical test: In the lab. The maximum score is 2 points but a minimum of 1 point is required.

In any case, the course is considered passed if the student receives the minimum qualifications in both the written and the practical test and a total score (resulting from the sum of those obtained in sections 1, 2 and 3) equal or greater than 5

EXAMINATION AT THE END OF THE COURSE

For the examination ath the END OF THE COURSE, all the students will are assesed in the modality of final exam as it has described previously.

Sources of information

BASIC BIBLIOGRAPHY

- Web Services & SOA: Principles and Technology. Michael Papazoglou. Pearson Education, 2012 . ISBN-10: 0273732161
- "Apache Axis2 Web Services".Deepal Jayasinghe, Arkham Azeez. Packt Publishing; 2 edition, 2011. ISBN-10: 184951156X

COMPLEMENTARY BIBLIOGRAPHY

- 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.
- 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.
- Web Services: A Technical Introduction. Harvey M. Deitel, Paul J. Deitel, B. DuWaldt, L. K. Trees. Prentice Hall, 2002. ISBN-10: 0130461350.
- 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.
- 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

Recommendations

Subjects that are recommended to be taken simultaneously

Distributed and Concurrent Programming/V05G300V01641
Information Systems/V05G300V01644

Subjects that it is recommended to have taken before

Internet Services/V05G300V01501