



Universitat de Lleida

DEGREE CURRICULUM
SOFTWARE ARCHITECTURES

Coordination: GARCIA GONZALEZ, ROBERTO

Academic year 2014-15

Subject's general information

Subject name	SOFTWARE ARCHITECTURES
Code	102055
Semester	1st Semester
Typology	Compulsory
ECTS credits	9
Groups	1
Theoretical credits	4.5
Practical credits	4.5
Coordination	GARCIA GONZALEZ, ROBERTO
Office and hour of attention	To be agreed, contact rgil@diei.udl.cat or rgarcia@diei.udl.cat
Department	Informàtica i Enginyeria Industrial
Teaching load distribution between lectures and independent student work	Total load: 225h - Lectures (40%) = 90h - Independent student work (60%) = 135h
Modality	Presencial
Important information on data processing	Consult this link for more information.
Language	English
Degree	Degree in Computer Engineering
Distribution of credits	GIL IRANZO, ROSA MARIA (5.4) GARCIA GONZALEZ, ROBERTO (3.6)
Office and hour of attention	To be agreed, contact rgil@diei.udl.cat or rgarcia@diei.udl.cat
E-mail addresses	rgil@diei.udl.cat rgarcia@diei.udl.cat

GIL IRANZO, ROSA MARIA
GARCIA GONZALEZ, ROBERTO

Learning objectives

- To present Web engineering and its fundamental applications patterns and architecture.
- To have a global vision of the existent technologies to implement enterprise applications using the previous patterns and architectures, especially Java, XML and the Web.
- To put into practice the previous concepts and technologies through the development of a Web application project using Java (Spring) and Javascript (AngularJS) and integrating XML technologies.

Competences

Strategic Competences

CT2. Mastering a foreign language, especially English.

CT3. Training Experience in the use of the new technologies and the information and communication technologies.

Cross-disciplinary Competences

EPS11. Capacity to understand the needs of the user expressed in a no technical language.

Specific Competences

GII-IS1. Capacity to develop, maintain and evaluate services and software systems that satisfy all the requirements of the user and behave in a reliable and efficient way, they can develop, keep and fulfil quality requirements, applying the theories, principles, methods and uses of the software engineering.

GII-IS3. Capacity to give solution to problems of integration taking into account the strategies, standards and available technologies.

GII-IS4. Capacity to identify and analyse problems and design, develop, implement, verify and find software solutions on the base of a suitable knowledge of the theories, models and current techniques.

Subject contents

1. Web Applications Specification
 1. Architecture
 2. Analysis
 3. Design
2. Application Patterns
 1. Introduction and layered architecture
 2. Patterns in the domain layer
 3. Patterns in the integration layer
 4. Patterns in the presentation layer
 5. Technologies for pattern application
3. XML
 1. Fundamentals
 2. XML Schema
 3. XQuery
4. Web Applications
 1. Introduction to Web Applications Implementation
 2. Web Applications using Java (Spring) and Javascript (AngularJS)
 3. Developing and deploying web applications in Heroku

Methodology

The methodology is based on a Project Based Learning approach where an enterprise software application is developed, focusing on Web-based applications. The course starts with a review of Web development frameworks from an industrial point of view analysing the number of job offers, StackOverflow questions, LinkedIn mentions, etc. Based on these dimensions, Spring is selected for the server side and AngularJS for the client one.

The first weeks of the course focus on fundamental aspects of software development, including project management ideas and development process concepts. Software architecture, specification, analysis and design are presented from a client/server and Web perspective, guided by enterprise application patterns. These concepts are the starting point for the students project development.

The students select a project, under professors guidance, and complete a first deliverable where they apply these fundamental concepts to specify, analyse and design their project.

The rest of the course focuses on the implementation of the defined project and the required concepts related to integrating external XML APIs, Spring or Angular are introduced as needed to complete the development of the project.

Development plan

Week 1: Web applications specification

Weeks 2 – 4: Web Applications Patterns

Weeks 5 – 7: XML, XML Schema and XQuery

1st Deliverable

Week 8: Midterm Exam

Weeks 9 – 10: Java Web Applications Fundamentals and XML API Integration

2nd Deliverable

Weeks 11 – 15: Java Web Applications

Week 18: Project Defence

3rd Deliverable

Evaluation

The evaluation is fundamentally based on the development of a project, chosen by the students under the professor guidance, with two intermediate deliverables and a final one:

- 1st Deliverable: 10% grade
Project specification.
- 2nd Deliverable: 20% grade
Develop Web application skeleton and integrate external XML API.
- 3rd Deliverable: 30% grade
Complete the development of the Web application, integrating all the previous work and completing the client (AngularJS) and server (Spring) parts.

The evaluation is complemented with two exams:

- Midterm exam: 20% grade, individual evaluation that tests the competences related to conceiving and

designing enterprise applications.

- Project defence: 20% grade, group evaluation where students present their project and their development and deployment skills are evaluated.

Bibliography

Main References

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- McLaughlin, B.; Edelson, J. (2006). Java and XML (3rd edition). O'Reilly.
 - Electronic Version¹: <http://proquest.safaribooksonline.com/059610149X>

Additional References

- XML Quick Reference, <http://www.mulberrytech.com/quickref/XMLquickref.pdf>
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 - Electronic Version¹: <http://proquest.safaribooksonline.com/0321180860>

¹ This book is accessible from the Universitat de Lleida network using this link