



Universitat de Lleida

DEGREE CURRICULUM  
**ENTERPRISE SOFTWARE  
ARCHITECTURE**

Coordination: GARCIA GONZALEZ, ROBERTO

Academic year 2014-15

## Subject's general information

<b>Subject name</b>	ENTERPRISE SOFTWARE ARCHITECTURE
<b>Code</b>	102029
<b>Semester</b>	2nd
<b>Typology</b>	Mandatory
<b>ECTS credits</b>	9
<b>Groups</b>	1
<b>Theoretical credits</b>	4.5
<b>Practical credits</b>	4.5
<b>Coordination</b>	GARCIA GONZALEZ, ROBERTO
<b>Office and hour of attention</b>	To be agreed, contact rgil@diei.udl.cat, rgarcia@diei.udl.cat or davidcastella@diei.udl.cat
<b>Department</b>	Informàtica i Enginyeria Industrial
<b>Teaching load distribution between lectures and independent student work</b>	Total load: 225h - Lectures (40%) = 90h - Independent student work (60%) = 135h
<b>Modality</b>	Presencial
<b>Important information on data processing</b>	Consult <a href="#">this link</a> for more information.
<b>Language</b>	English
<b>Degree</b>	Degree in Computer Engineering
<b>Distribution of credits</b>	GIL IRANZO, ROSA MARIA (3) GARCIA GONZALEZ, ROBERTO (3) CASTELLA PONSARNAU, DAVID (3)
<b>Office and hour of attention</b>	To be agreed, contact rgil@diei.udl.cat, rgarcia@diei.udl.cat or davidcastella@diei.udl.cat
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GIL IRANZO, ROSA MARIA  
 GARCIA GONZALEZ, ROBERTO  
 CASTELLA PONSARNAU, DAVID

## Learning objectives

- To present aspects of Software Engineering focusing on enterprise applications and presenting a series of patterns for enterprise applications and their 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), also 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-TI1.** Capacity to understand the environment and needs of an organisation in the field of the information and communication technologies.

**GII-TI2.** Capacity to choose, design, deploy, integrate, evaluate, build, manage, explode and keep the hardware, software and network technologies inside the cost and quality requirements.

**GII-TI5.** Capacity to select, deploy, integrate and manage systems of information that satisfy the needs of the organisation, within the cost and quality requirements.

**GII-TI6.** Capacity to conceive systems, applications and services based in network technologies, including Internet, web, e-commerce, multimedia, interactive services and mobile computation.

## Subject contents

1. Project Management and Specification
  1. Project Management
  2. Architecture
  3. Analysis
  4. Design
2. Enterprise Application Patterns
  1. Introduction to patterns
  2. Patterns in the context of enterprise applications
  3. Patterns details
  4. Patterns application examples
  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 Angular (Javascript)
  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

Weeks 1 – 2: Project Management and Specification

Weeks 3 – 5: Enterprise Applications Patterns

Week 6 – 8: XML Fundamentals, XML Schema and XQuery

1<sup>st</sup> Deliverable

Week 9: 1<sup>st</sup> Midterm Exam

Week 10: Practical XQuery

2<sup>nd</sup> Deliverable

Week 11 – 15: Java and Javascript Web Applications

Week 18: Project Defence

3<sup>rd</sup> 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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- Amuthan, G. (2014). Spring MVC: Beginner's guide Birmingham. Packt Publishing.
- Walmsley, P. (2007). XQuery. Sebastopol, CA: O'Reilly Media.
- McLaughlin, B.; Edelson, J. (2006). Java and XML (3rd edition). O'Reilly.
  - Electronic Version<sup>1</sup>: <http://proquest.safaribooksonline.com/059610149X>

### Additional References

- XML Quick Reference, <http://www.mulberrytech.com/quickref/XMLquickref.pdf>
- Larman, C. (2002). UML y Patrones. Prentice-Hall (segunda edición).
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- Newcomer, E.; Lomow, G. (2004). Understanding SOA with web services. Addison-Wesley.
  - Electronic Version<sup>1</sup>: <http://proquest.safaribooksonline.com/0321180860>

<sup>1</sup> This book is accessible from the Universitat de Lleida network using this link