

# Description of Course Unit

**Master in Informatics and Computing Engineering**  
**Markup Languages and Document Processing**  
**Instance: 2014/2015**

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[\*Institutional page\*](#)

## General information

**Course Unit:** Markup Languages and Document Processing  
**Code:** EIC0107  
**Programmes:** MIEIC, 4º  
**Academic Year:** 2014/2015  
**Semester:** 2S  
**Credits:** 6  
**ECTS:** 6  
**Hours/Weeks:** 3 TP  
**Teachers:** [João Correia Lopes](#)

## Teaching language

Portuguese. Suitable for English-speaking students.

## Objectives

### BACKGROUND

The "Markup Languages and Document Processing" unit assumes as its context the widespread use of markup languages for representing semi-structured information and the existence of standardized tools for their treatment.

### OBJECTIVES

1. Make the students aware of the multiple non-trivial applications of markup languages;
2. Make the students familiar with the technologies of processing and storage of semi-structured information;
3. Explore the technologies in defining an annotation language and in the development of an application.

## Skills and learning outcomes

On completion of this course, the student should be able to:

- Identify the use of markup languages in documents, in data repositories and in applications;
- Create models for XML documents;
- Tell the difference between a standardised language for an application domain and the ad-hoc uses of markup languages;

- Design a markup language to support a document type or the data for an application;
- Evaluate and compare XML-based and other solutions to support application data interchange;
- Design XSL stylesheets to transform documents;
- Interpret the results of document processing with XML-based technologies;
- Use a native XML database and take advantage of its query functions;
- Compare data organisation in markup models with the relational model and translate data between both models;
- Generate a markup model for data in an application domain, store a dataset and query it;
- Compare markup languages to other document and data representations with respect to the support to data preservation along technological change;
- Relate web documents with the metadata that describes or links them;
- Compare semantic web based services with simpler approaches to resource description;
- Develop an XML-based prototype application involving the use of a dialect and document processing.

## Work mode

Classroom.

## Previous knowledge

Students must have basic skills in markup languages and technologies.

## Program

- Design of markup languages. Analysis of existing languages for different domains.
- Querying XML documents. The XPath language. The XQuery language.
- XML document transformation with XSLT. XML presentation with XSL-FO.
- XML processing in applications. The standard interfaces DOM and SAX.
- Storage of XML in native XML databases. XML storage in object-relational databases.
- Introduction to the Semantic Web. RDF, OWL, Linked Open Data.

## Main bibliography

- Anders Møller, Michael I. Schwartzbach; *An Introduction to XML and Web Technologies*, Addison Wesley Professional, 2006. ISBN: 0321269667 [Biblioteca](#)

## Complementary bibliography

- Neil Bradley, *The XML Companion*, Addison-Wesley, 3rd Edition, 2002, ISBN: 0-201-77059-8. [Biblioteca](#)
- José Carlos Ramalho, Pedro Henriques; *XML e XSL &mdash; da Teoria à Prática*, FCA Editora, 2002, ISBN: 972-722-347-8. [Biblioteca](#)
- Elliotte Rusty Harold, W. Scott Means, *XML in a Nutshell*, O'Reilly, Third Edition, 2004, ISBN: 0-596-00292-0. [Biblioteca](#)
- Grigoris Antoniou and Frank van Harmelen, *A Semantic Web Primer*, 2nd edition, The MIT Press, 2008, ISBN: 9780262018289

## Teaching procedures and learning activities

Lectures include theoretical presentation of the course subjects and practical sessions where proposed research topics are discussed with the students and practical coursework is reported.

## Support software

- eXist
- oXygen
- XML Spy

## Keywords

Physical sciences > Computer science > Informatics

## Evaluation type

Distributed evaluation without final exam

## Evaluation and occupation components

The practical work is broken down into three components with the delivery of a small scientific paper and a presentation and discussion.

The theoretical concepts are evaluated through the individual response to 4 questionnaires.

### Evaluation components

| Description                     | Type          | Time (hours) | Conclusion date |
|---------------------------------|---------------|--------------|-----------------|
| Teaching classes (estimated)    | lectures      | 42           | —               |
| Quiz #1: storage                | Questionnaire | 0            | 12/03/2015      |
| Project proposal (D1)           | Work          | 27           | 26/03/2015      |
| Quiz #2: XQuery                 | Questionnaire | 0            | 09/04/2015      |
| Quiz #3: XSLT                   | Questionnaire | 0            | 23/04/2015      |
| Architecture and prototype (D2) | Work          | 33           | 30/04/2015      |
| Quiz #4: RDF                    | Questionnaire | 0            | 28/05/2015      |
| XML application (D3)            | Work          | 60           | 04/06/2015      |
| Total:                          |               | 162          | —               |

### Occupation components

Practical work 126

Classes 36

## Admission to exams

n/a

## Final grade

Classification = 70% Practical assignments + 30% Questionnaires, where: Practical assignments = 20% D1 + 30% D2 + 50% D3.

The practical work will be assessed through the documentation submitted up to their due dates established in the course plan, the participation in the presentations and through the developed XML-based application.

The individual questionnaires last for 20 minutes and take place during class.

The minimum required to pass the course is 40% in each of the deliverables and presentations of practical assessment (D1 to D3) and 40% on average of the Quiz #1 to Quiz #4 questionnaires related theoretical subjects. There is no recovery exam.

This course, given its nature, is not eligible for evaluation in a single moment, so the practical work evaluation cannot be replaced by taking an exam.

## Special assignments

There are no special works or tests.

## Special evaluation (TE, DA, ...)

Students taking exams under special regimes are expected to previously submit the assignments required for this course at the same time as regular students.

## Improvement of final/distributed classification

Students may improve the mark in the course's next edition.

- JCL

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