

Software Engineering

Software Engineering and UML Modelling

IDENTIFICATION

CODE : IF-3-S2-EC-GL
ECTS : 3.0

HOURS

Lectures : 13.5 h
Seminars : 6.0 h
Laboratory : 20.0 h
Project : 0.0 h
Teacher-student
contact : 39.5 h
Personal work : 35.0 h
Total : 74.5 h

ASSESSMENT METHOD

- Practicals: written report by groups of 4 students.
- Written exam [1.5 hours]

TEACHING AIDS

- Lecture notes
- Exercises

TEACHING LANGUAGE

English

CONTACT

M. HASAN Omar
omar.hasan@insa-lyon.fr

AIMS

This course gives an overview of the principal concepts and techniques of Software Engineering and addresses more deeply the design of object-oriented software with UML. These concepts are put into practice in a mini-project where an application is developed in a collaborative way.

The expected competences are:

- Defining requirement specifications for a software to be developed.
- Establishing an iterative software development process.
- Modeling a software with UML incorporating the fundamental principles of object-oriented design.
- Developing a [C++] application from a conceptual UML model.
- Using collaborative development utilities (version control, IDE).
- Creating and setting up automated software tests.

CONTENT

The principal points addressed are:

- The formal definition of a future software (requirements specification).
- The set of processes involved in the life cycle of a software.
- The principles and methodologies of object-oriented software modelling and design. We will concentrate on the Unified Modelling Language (UML), and address the main types of diagrams that are able to model the structure and behaviour of an application.
- "Security by design" : aim of security, possible attacks, requirement analysis, different security strategies for software design and development.
- Versioning techniques and utilities, and software integration.
- Software test and validation strategies.

BIBLIOGRAPHY

(i) On Software Engineering:
"Génie logiciel : principes, méthodes et techniques", A. Strohmeier, D. Buchs
"Software Engineering", Ian Sommerville
"Software Engineering - A Practitioner's Approach", Roger Pressman

(ii) On the UML Meta-Model:
<http://www.omg.org/uml>

(iii) On Object Oriented Modeling with UML:
"UML en action", Pascal Roques and Franck Lavallée, Ed. Eyrolles
"Modélisation Objet avec UML", Pierre-Alain Muller and Nathalie Gaertner

PRE-REQUISITE

- Algorithmics and programming (C++/Java).
- Object-oriented programming principles (encapsulation, inheritance, abstraction, genericity).

INSA LYON

Campus LyonTech La Doua

20, avenue Albert Einstein - 69621 Villeurbanne cedex - France
Phone +33 [0]4 72 43 83 83 - Fax +33 [0]4 72 43 85 00
www.insa-lyon.fr