2EL5010 – Introduction to mobile applications engineering

Instructors: Virginie Galtier
Department: CAMPUS DE METZ
Language of instruction: FRANCAIS
Campus: CAMPUS DE METZ
Workload (HEE): 60
On-site hours (HPE): 35,00
Elective Category : Fundamental Sciences
Advanced level : Yes

Description

Because of their ease of use and their ability to follow us everywhere, mobile devices (phones, tablets) have become first-class terminals and many companies have made the shift from "web-first" to "mobile-first" strategy.

This course focuses on the development phase of a mobile application, after the specification of its functionalities and before its possible publication on a store. Two main strategies will be presented: web applications, with limited functionalities usable on both Android and iOS, native applications, more powerful but requiring specific developments. A wide part of this course is dedicated to concrete work, on Android to illustrate the development of native mobile apps, and with Ionic and Angular (for example) to illustrate the development of reactive web site. Optionally, students will also learn about securing Android applications.

The knowledge and know-how acquired during this course may be useful in some curriculum-assigned projects, or in campus associations or enterprise activities.

Quarter number
SG6

Prerequisites (in terms of CS courses)
1CC1000 –Information Systems and Programming

Syllabus
Introduction

- Overview of mobile application development strategies
- Basics of Object Oriented Programming in Java

Android application development

- Android system overview
- Development tools
- Design and implementation of applications based on Activities, Layouts and Intents

Introduction to web application development

- Basics of HTML5, JavaScript and CSS
- Design and implementation of a simple web application

Depending on progress: Introduction to Android applications security

- Presentation of common vulnerabilities
- Protection mechanisms

Class components (lecture, labs, etc.)

The structure "6 labs + 16 lectures" is administrative because the course is actually mostly composed of "learning by doing" sessions led by teachers and industrial experts. The introduction to the security of android applications will take the form of an escape game.

Grading

The skills acquired by the student during the course will be evaluated on the basis of a final individual written test (1/2), and the development and presentation with a fellow student of a personal Android application with some imposed elements (1/2).

Re-take exam: 20-minute oral exam + new project with a predefined description, to be carried out individually

Course support, bibliography

- *Head First Android Development.* Dawn Griffiths, David Griffiths. O'Reilly. 2015
- *Building Progressive Web Apps: Bringing the Power of Native to the Browser.* Tal Ater. O'Reilly. 2017
- *HTML, CSS, and JavaScript All in One*. Julie C. Meloni. Pearson Education. 2014

Resources

Teaching staff: Virginie Galtier, Michel Ianotto, Patrick Mercier and guest speakers (InTech)
Tutorial class: 24 students

Lab sessions: computer rooms of Metz campus, 24 students /room
Software tools: free and open source software

Learning outcomes covered on the course
At the end of this course, students should be able to:

- understand and code object oriented programs in Java
- choose a development strategy according to objectives and resources
- build a simple web application
- develop a simple Android native app
- optionally, apply some best practices for securing Android applications

Description of the skills acquired at the end of the course

C1: Design: specify, implement and validate all or part of a complex system
C2: Develop in-depth skills in an engineering field and a family of professions
C6: Be operational, responsible, and innovative in the digital world