UNIVERSITÀ
DEGLI STUDI DI MILANO-BICOCCA

COURSE SYLLABUS

Mobile Programming

2627-3-E3101Q135

Aims

The course has the following specific learning objectives:

- Knowledge and understanding (DdD 1): Understand the design principles of mobile applications, including architectural best practices, and apply this knowledge in the Android environment.
- Applying knowledge and understanding (DdD 2): Be able to apply programming and design principles to develop medium-scale real-world mobile applications for the Android platform.

Contents

Design and development of mobile applications. Development of applications for Android devices.

Detailed program

1) Introduction to the design and development of mobile applications
- Development of mobile applications
- Market Opportunities
- Technical requirements for Apple (iOS), Google (Android)
- Challenges: limited screen size, memory problems and fragmentation
- Notes to cross-platform framework (e.g., Flutter, React Native, Apache Cordoba, Sencha, Corona, Xamarin)
2)Designing an Android Application
- Principles of Clean Architecture: separation into layers (domain, data, presentation), dependency inversion, modularization, and testability.
- Google-recommended architecture: use of MVVM, Repository pattern, Jetpack components (ViewModel,

LiveData, Room, Navigation), and separation of concerns.
- Mobile-First design and cross-device synchronization
3) Development of applications for Android devices
- Introduction to the Android platform
- Development Environment: Android Studio, Google Software Development kit and versions, Genymotion and debugger
- Life cycle of an application: Activities and Fragments
- Basic and advanced layouts and widgets
- The competition: asynchronous threads and tasks
- Beyond the graphic aspect: Content providers and services
- Background Task
- Publish an application on the Google Play Store
-Testing

Prerequisites

Object-oriented programming with Java and distributed programming

Teaching form

Lectures and recitations. Practice labs with tutor support and auxiliary leaning material.
The in-class lectures and practice labs follow the "modalità erogativa" and "modalità interattiva" modes.
The course will be given in Italian.

Textbook and teaching resource

Lecture slides and in-class exercises
Official Android documentation – https://developer.android.com

Semester

First semester

Assessment method

The final grade is based on three components:

- Group project (70%)
- Final individual quiz (30%)
- In-class formative activities (bonus up to +2 points)

Group Project (70%)
The project is carried out in groups and includes:

- requirements analysis;
- software architecture design;
- Android application development;
- testing of the implemented solution;
- technical documentation;
- final presentation.

The project evaluation is based on:

- completeness of the proposed solution;
- architectural quality;
- code quality;
- correct use of the technologies presented during the course;
- user experience;
- quality of the produced documentation.

2. Final Individual Quiz (30%)
   The quiz is taken individually and aims to assess the student's understanding of the concepts covered during the course, as well as the ability to analyze and understand Android code.
   The quiz consists of multiple-choice and code-completion questions covering the topics discussed during the course.
   To be eligible for the evaluation of the group project, students must obtain at least 50% of the available points in the individual quiz.
   If this threshold is not met, the project grade remains valid and does not need to be repeated; however, the student must retake the individual quiz in a subsequent exam session.

3. In-Class Formative Activities (Bonus)
   During the semester, short individual in-class activities (e.g., quizzes, code analysis exercises, and discussions of design solutions) will be proposed.
   Participation in these activities is not mandatory.
   Performance in these activities may contribute up to 2 bonus points to the final grade.
   Non-participation does not result in any penalty and does not prevent students from achieving the maximum final grade.

Office hours

On appointment.

Sustainable Development Goals