



UNIVERSITÀ  
DEGLI STUDI DI MILANO-BICOCCA

## COURSE SYLLABUS

### Mobile Programming

2526-3-E3101Q135

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#### 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 Cordova, 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 learning 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**

Assignment of a practical project and oral discussion of the project.

The artifacts of the project must include a project description document, the software and its documentation. The oral discussion will focus on the solution adopted on the project.

The project will be evaluated with respect to the completeness of the proposed solution, the design of the solution,

and the user experience.

## **Office hours**

On appointment.

## **Sustainable Development Goals**

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