

Mobile Architectures

Informatics Engineering Department

Coimbra Institute of Engineering

Objectives

- To understand the functioning of operating systems for mobile devices and their specificities
- To understand the advantages and disadvantages of mobile application development
- To develop native applications for mobile devices
- To develop cross-platform applications

Course context

- 1st degree in Informatics Engineering (daytime and evening classes)
 - Application Development specialization
- Teachers
 - Theoretical classes:
 - Álvaro Santos (ans@isec.pt)
 - Practical classes:
 - Álvaro Santos (ans@isec.pt)
 - Filipe Alves (filipe.alves@isec.pt)

Generic program

- Concepts about mobile systems, disseminated systems and ubiquitous systems
- Concepts on application development for mobile devices
- Mobile application development
 - Components of a mobile application
 - Application lifecycle
 - Definition of screens and visual components
 - User interaction mechanisms
 - Lists
 - Data persistence
 - Performing asynchronous tasks
 - Communication with other devices and Web services
 - Location awareness
 - Sensors
 - Image capture
- Cross-platform application development
 - Advantages and disadvantages of cross-platform development
 - Component-based application development
- Mobile application deployment

Generic program (practical classes)

- Mobile application development
 - Mobile application development guidelines and technologies
 - Android applications in Kotlin
 - XML and Jetpack Compose
 - Cross-platform applications in Flutter
- Other topics
 - Google Maps
 - Firebase
 - Web services
 - ...

Workload

- 6 ECTS \Rightarrow \approx 160 hours
- Contact hours (base: 15 weeks)
 - Theoretical-practical component: 30 hours
 - Practical-laboratory component: 45 hours
- Hours of unaccompanied study
 - Theoretical-practical study: \approx 15-20 hours
 - Development work: \approx 60-65 hours
- Assessment
 - Written exam: \approx 2 hours
 - Defense of works: \approx 1-2 hours

Assessment

- The evaluation, on a 0..20 scale, will be carried out through the following components:
 - Written exam (5 marks)
 - Individual written test with limited consultation
 - Minimum mark: 35%
 - Practical works (12 marks)
 - Attendance (3 marks)

Practical work

- Two group works
 - 1st Work (9 marks)
 - Native *Android in Kotlin*
 - Work description will be available in the 1st week of November
 - Delivery date: **2024.01.02 08:00**
 - 2nd Work (3 marks)
 - *Flutter*
 - Work description will be available in the 2nd week of December
 - Delivery date : **2024.01.02 08:00**

Practical work

- Additional delivery notes
 - Submission location: Nónio
 - ZIP format (**1st student work: uninstall WinRAR**)
 - Technical report in PDF format
 - Project with work
 - **Penalty: 5% for each hour of delay**
- Mandatory defense
 - Held on a date to be announced after delivery
- Minimum mark: 35% in each work

Groups

- Number of elements: **3**
 - Preferably from the same class
- The constitution of the groups must be handed in:
 - Nónio (an activity will be available for this purpose)
 - Submitted as a text file with the following format:

Elements:

```
- <full_name_std1>, <std1_id_Nonio>, <practical_class_std1>, <e-mail_isec_std1>
- <full_name_std2>, <std2_id_Nonio>, <practical_class_std2>, <e-mail_isec_std2>
- <full_name_std3>, <std3_id_Nonio>, <practical_class_std3>, <e-mail_isec_std3>
```

- Deadline: 2023.10.31
 - After this date, no more groups will be accepted
 - The work must be carried out individually
- **NOTE: All submissions through Nónio must be carried out by only one member of the group, who must associate the remaining members of the group with the delivery**

Attendance

- 3 marks
 - Theoretical classes: 0.1 for each class, up to a maximum of 1
 - Practical classes: 0.2 for each class, up to a maximum of 2
- Students who have a status that exempts them from attending classes (e. g., student-worker) can obtain the 3 marks by taking a test at the end of the semester
 - These students, upon starting the additional test, will automatically lose any marks that were obtained from attending classes
- This component is not subject to a minimum grade

Study elements

- Android
 - “Kotlin Programming Language”, <https://kotlinlang.org/>
 - “Android”, <http://www.android.com>
 - “Android Developers”, <http://developer.android.com>
 - Ricardo Queirós, 2014, “Development of Professional Applications on Android”, FCA Editora
 - There are several books in the library about programming for Android
- iOS
 - “Apple Developer”, <http://developer.apple.com>
 - “Swift – Apple Developer”, <https://developer.apple.com/swift/>
- Flutter
 - “Flutter”, <https://flutter.dev>
 - “Flutter Documentation”, <https://flutter.dev/docs>
 - “Dart programming language”, <https://dart.dev/>
 - “Dart documentation”, <https://dart.dev/guides>
 - “DartPad”, <https://dartpad.dartlang.org/>
 - “Dart and Flutter packages”, <https://pub.dev/>
- Generic
 - <http://www.stackoverflow.com>
 - <http://www.codeproject.com>
- Slides are an aid...
 - for the teacher to present the content
 - for the student to organize the study, and should not be the main element of study