

Module Description

# Mobile Operating Systems and Applications

**General Information**

**Number of ECTS Credits**

3

**Abbreviation**

TSM\_MobOp

**Version**

30 Oct. 2017

**Responsible of module**

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**Language**

	Lausanne	Bern	Zürich
Instruction	<input type="checkbox"/> E <input checked="" type="checkbox"/> F	<input type="checkbox"/> D <input type="checkbox"/> E <input type="checkbox"/> F	<input type="checkbox"/> D <input checked="" type="checkbox"/> E
Documentation	<input checked="" type="checkbox"/> E <input checked="" type="checkbox"/> F	<input type="checkbox"/> D <input type="checkbox"/> E <input type="checkbox"/> F	<input type="checkbox"/> D <input checked="" type="checkbox"/> E
Examination	<input type="checkbox"/> E <input checked="" type="checkbox"/> F	<input type="checkbox"/> D <input type="checkbox"/> E <input type="checkbox"/> F	<input type="checkbox"/> D <input checked="" type="checkbox"/> E

**Module category**

- Fundamental theoretical principles
- Technical/scientific specialization module
- Context module

**Lessons**

- 2 lecture periods and 1 tutorial period per week
- 2 lecture periods per week

**Brief course description of module objectives and content**

This module enables students to work with mobile operating systems and platforms such as Android and/or iOS (iPhone/iPad) and to quickly understand concepts of other mobile platforms. Besides a review of the operating systems and application programming interfaces of these platforms, this course provides the necessary basics for mobile application development. Lecturers share their experience and best-practices from recent projects involving mobile application development. Students work with both simulation environments and real devices / phones.

**Aims, content, methods**

**Learning objectives and acquired competencies**

Mobile Operating systems

- Students know how to use the most common platforms for application development
- Students can describe their architecture and functionality
- Students can explain their specific mechanisms

Applications

- Students have the basic knowledge to design and implement applications for mobile devices running platforms such as Android and iOS.
- Students know how to use platform-specific functionality including device sensors (geo-location, etc.) and network APIs to the cloud / server
- Students have basic knowledge of user-interface design guidelines and techniques relevant for mobile application design

**Contents of module with emphasis on teaching content**

Operating systems

- Architecture and mechanism of operating systems for mobile devices  
(Overview, Architecture, Scheduling, Memory and Security)

Applications

- Development of networked mobile applications
- Developing user interfaces for mobile applications (usability and considerations regarding cross-platform apps)

- Specific aspects in mobile application programming such as application lifecycle, use of sensors, data storage, data synchronization with servers and cloud services, security / sandboxing of mobile applications and power management
- Cross-platform development (Optional topic)

**Teaching and learning methods**

- Ex-cathedra teaching
- Mini-projects
- Exercises
- Self-Study

**Prerequisites, previous knowledge, entrance competencies**

The students have working knowledge in

- computer systems, processors, bus systems, concepts of operating systems
- programming in Java
- software development and frameworks
- networks
- desktop user interface development

Students bring a laptop to class that enables them to do practical iOS exercises and run the XCode IDE (if applicable).

Students bring an Android phone to class that enables them to demonstrate the result of their mini-project on this device

**Literature****Android:**

- Android Open Source Project (<https://source.android.com/>)
- Android Developers (<https://developer.android.com/index.html>)
- More: <https://www.lifewire.com/top-books-on-android-app-development-2373595>

**iOS:**

- iOS Developer Library (<https://developer.apple.com/develop/>)
- CS 193P iPhone Application Development
  - <https://web.stanford.edu/class/cs193p/>
  - <https://itunes.apple.com/us/course/developing-ios-10-apps-with-swift/id1198467120>
  - [https://www.youtube.com/watch?v=iIQ-tq772VI&list=PLPA-ayBrweUz32NSgNZdl0\\_QISw-f12Ai](https://www.youtube.com/watch?v=iIQ-tq772VI&list=PLPA-ayBrweUz32NSgNZdl0_QISw-f12Ai)

**Assessment****Certification requirements for final examinations (conditions for attestation)**

none (no Testatbedingung / tests exigés)

Mini projects count 30% of final examination mark

**Written module examination**

Duration of exam : 120 minutes

Permissible aids: Closed book examination (personal 1-page summaries allowed)