

Module Description

# Mobile Operating Systems and Applications

**General Information**

**Number of ECTS Credits**

3

**Abbreviation**

TSM\_MobOp

**Version**

19.02.2015

**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 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

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

This module enables students to work with mobile operating systems and platforms such as Android, iOS (iPhone/iPad) and to quickly understand concepts of other platforms, such as WinPhone. Besides a review of the operating systems and application programming interfaces of these platforms, this course provides the necessary basics for 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, iOS and (to some degree) WinPhone.
- Students know how to use platform-specific functionality including device sensors (geo-location, etc.) and network APIs to the cloud / server and how to design viable user interfaces

**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)
- Case Studies: Detailed coverage of modern operating systems for mobile devices (Android, iOS)

Applications

- Development of mobile applications on platforms such as Android (mini-project), iOS and WinPhone (optional)
- 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

#### 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 & C++ and XML
- software development and frameworks
- networks
- concepts of user interfaces, MVC

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

#### Literature

Android:

- Android Open Source Project (<http://source.android.com/>)
- Android Developers (<http://developer.android.com/index.html>)

iOS:

- iOS Developer Library (<http://developer.apple.com/library/ios>)
- CS 193P iPhone Application Development (<http://www.stanford.edu/class/cs193p>)

Applications

- Android Developer's Guide (<http://developer.android.com/guide>)
- Zigurd Mednieks et al.: Programming Android, O'Reilly
- iTunesU: iPhone Application Development (<http://www.stanford.edu/class/cs193p>)

#### 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 (no documentation allowed)