Software foundations

General Information

Number of ECTS Credits
3

Module code
TSM_SoftFound

Valid for academic year
2019-20

Last modification
2018-11-05

Coordinator of the module
Tiziano Leidi (SUPSI, tiziano.leidi@supsi.ch)

Explanations regarding the language definitions for each location:

- Instruction is given in the language defined below for each location/each time the module is held.
- Documentation is available in the languages defined below. Where documents are in several languages, the percentage distribution is shown (100% = all the documentation).
- The examination is available 100% in the languages shown for each location/each time it is held.

	Berne	**Lausanne**			**Lugano**	**Zurich**		
Instruction					**X** E 100%			
Documentation					**X** E 100%			
Examination					**X** E 100%			

Module Category
TSM Technical scientific module

Lessons
2 lecture periods and 1 tutorial period per week

Entry level competences

Prerequisites, previous knowledge

Programming skills in Java, C and C++
Ground software engineering skills (in particular design pattern, concurrent programming and application development for the web)

Brief course description of module objectives and content

This course provides ground competences on contemporary software technologies with focus on software architectures and computing models in the era of cloud computing and the internet of things.

Aims, content, methods

This course provides ground competences on contemporary software technologies. The course will review the recent evolution of software engineering methodologies with focus on software architectures and computing models in the era of cloud computing and the internet of things.

Focus will be on consolidating the required transversal foundation of advanced technical skills for modern software development, with particular care on the role played by recent innovations, for example in distributed big-data processing and in micro-service architectures.

The course will be proposed as a combination of lectures and exercises, including practical demonstrations and laboratory development. Readings will be assigned to students as complementary deepening material.

Contents of module with emphasis on teaching content

The student will be provided knowledge about modern development methodologies, frameworks and tools, including:
- Cloud computing technologies (IaaS, PaaS, SaaS and other fundamentals)
- Container technologies (Docker)
- Infrastructures for container orchestration (Kubernetes)
- Frameworks for REST APIs development (Spring Boot)
- Software architectures and design patterns for microservices
- Message queuing protocols and technologies (AMQP)
- Tools and methodologies for DevOps and CI/CD
- Infrastructures and frameworks for big-data computing (Hadoop, Spark)
- Serverless computing technologies (FaaS and lambdas)
- IoT enabling technologies
- Key IoT architectural choices and IoT-friendly protocols

Teaching and learning methods

Frontal theoretical lessons, demonstrations, examples, exercises

Literature

Assessment

Certification requirements

Module does not use certification requirements

Basic principle for exams

As a rule, all the standard final exams for modules and also all resit exams are to be in written form

Standard final exam for a module and written resit exam

Kind of exam

written

Duration of exam

120 minutes

Permissible aids

No aids permitted

Special case: Resit exam as oral exam

Kind of exam

oral

Duration of exam

30 minutes

Permissible aids

No aids permitted