Module Description, available in: EN

DevOps of cloud-native applications

General Information

Number of ECTS Credits

3

Module code

TSM_DevOps

Valid for academic year

2024-25

Last modification

2023-11-26

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.

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

Module Category

TSM Technical scientific module

Profile Recommendations

This module is recommended for the following profiles:

	Lugano
Profile	CS

Lessons

2 lecture periods and 1 tutorial period per week

Entry level competences

Prerequisites, previous knowledge

Programming skills in Java
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 focus on software technologies, architectures, and methodologies for development of cloud-native applications.

Aims, content, methods

Learning objectives and competencies to be acquired

This course provides detailed skills on contemporary software solutions that allow developing cloud-native applications. The course will introduce and deepen the recent evolution of technologies, architectures and methodologies for microservice-based systems, by taking advantage of a DevOps approach.

The course goal is the consolidation of required advanced technical skills for modern software development in the cloud, with particular care on the role played by the recent innovations.

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.

Module content with weighting of different components

The student will be provided knowledge about modern development methodologies, frameworks and tools, including:

- Introduction to cloud computing technologies (IaaS, PaaS, SaaS and other fundamentals) - 5%
- Tools and methodologies for DevOps and CI/CD - 10%
- Container technologies (Docker) - 10%
- Infrastructures for container orchestration (Kubernetes) - 20%
- Cloud native and micro services oriented development - 15%
- Protocols and technologies for micro services communication - 5%
- Serverless computing technologies (FaaS) - 10%
- Techniques for infrastructure as a code (Terraform) - 10%
- Service mesh, storage orchestration, monitoring and logging - 5%
- Authentication and security - 10%

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 standard final exams are conducted in written form. For resit exams, lecturers will communicate the exam format (written/oral) together with the exam schedule.

Standard final exam for a module and written resit exam

Kind of exam

Written exam

Duration of exam

120 minutes

Permissible aids

No aids permitted

Special case: Resit exam as oral exam

Kind of exam

Oral exam

Duration of exam

30 minutes

Permissible aids

No aids permitted