

**Module Description, available in: EN**

## Cloud Computing for Advanced

**General Information****Number of ECTS Credits**

3

**Module code**

TSM\_CIComp

**Valid for academic year**

2026-27

**Last modification**

2020-02-10

**Coordinator of the module**

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**Explanations regarding the language definitions for each location:**

- Instruction is given in the language specified for each location and module execution.
- Documentation is available in the language(s) listed for each location and module execution. If the documentation is in multiple languages, the percentage distributed is indicated (100% = all documentation provided).
- The examination, including both questions and answers, is provided entirely (100%) in the language(s) specified for each location and module execution. The exams are on-site.

	Lausanne			Lugano	Zurich		
<b>Instruction</b>					X E 100%		
<b>Documentation</b>					X E 100%		
<b>Examination</b>					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**

Basic understanding of software and systems engineering, basic usage of Linux, communication technologies/networking.

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

Lecture on advanced topics in the domain of Cloud Computing, more precisely covering fundamental concepts, economics, application, operation, development of and for IaaS, PaaS, as well as their application for DevOps and Cloud-Native Applications

## Aims, content, methods

### Learning objectives and competencies to be acquired

- Conceptual understanding of the principles and architectural design of IaaS and PaaS services, as well as concrete implementations/frameworks.
- Ability to operate and use IaaS-frameworks.
- Ability to operate and use PaaS-frameworks.
- Understanding of Infrastructure as Code and IaaS and PaaS management APIs.
- Ability to design services and service-oriented applications natively for the cloud.
- Ability to leverage features of the cloud, that is on-demand, self-service, elasticity, multi-tenancy, metered service, broadband network access.
- Ability to evaluate the economic, legal and technological advantages of cloud as well as inherent limitations.

### Module content with weighting of different components

- Definitions, Motivation, Economics, Principles, Service and Deployment Models, DC Architectures
- Example Application of IaaS (OpenStack)
- Cluster Management - IaaS Resource Orchestration by Example of OpenStack
- Cluster Management - Container Orchestration by Example of Kubernetes
- Virtualization of Compute Resources / Hypervisors
- Virtualization of Compute Resources / Containers
- Virtualization of Networking Resources / Cloud Networking
- Virtualization of Storage Resources / Basic Concepts, Block, File and Object Storage Services
- Infrastructure as Code, Gitops, Declarative State
- Basic Concepts, Architecture of a PAAS, Deployments / Blue--Green, Continuous Deployment., Tools, ArgoCD
- System Design, Resilient Architectures
- Serverless Computing
- Cloud Native Architecture
- Operating Models / Monitoring, Logging, Tracing
- Operations / Rating, Charging, Billing, Product and Service Selection, Economics, Cloud-Financial Management

### Teaching and learning methods

2 Lectures, 1 tutorial session per week

Self-study based on lecture material and literature (papers, books)

### Literature

## Assessment

### Additional performance assessment during the semester

The module does not contain an additional performance assessment during the semester

### 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

*Aids permitted as specified below:*

#### Permissible electronic aids

No electronic aids permitted

#### Other permissible aids

1A4-sheet (double-sided) of hand-written notes, English dictionary

**Exception: In case of an electronic Moodle exam, adjustments to the permissible aids may occur. Lecturers will announce the final permissible aids prior to the exam session.**

**Special case: Resit exam as oral exam**

**Kind of exam**

Oral exam

**Duration of exam**

30 minutes

**Permissible aids**

No aids permitted