

# Cloud Computing

## General Information

### Number of ECTS Credits

3

### Module code

TSM\_CiComp

### Valid for academic year

2020-2021

### Last modification

2020-02-10

### Responsible of module

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### 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

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 use, operations, development of and for IaaS and PaaS, as well as developing applications natively for the cloud.

## Aims, content, methods

### Learning objectives and acquired competencies

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 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.

### Contents of module with emphasis on teaching content

- Definition, Origin and Motivation, Principles, Services (IaaS, PaaS, SaaS) and Deployment Models (Public, Private, Hybrid)
- IaaS - Successful commercial example: Amazon Web Services (AWS)
- IaaS - OSS Alternative: Kubernetes, Architecture, Services, Usage
- IaaS - Compute Virtualization - Hypervisors and Containers
- IaaS - Storage Virtualization - Basic Concepts, Block, File and Object Storage Services
- IaaS - Network Virtualization - Software Defined Networking
- Cloud Security
- PaaS - OSS Alternative: CloudFoundry, Architecture, Services, Usage
- PaaS - Continuous Deployment
- PaaS - Cloud-native Application Design Principles
- FaaS - Function as a Service / Serverless Computing

### Teaching and learning methods

2 Lectures, 1 tutorial session per week  
Self-study based on lecture material and literature (papers, books)

### 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 repetition exams are to be in written form**

### Standard final exam for a module and written repetition exam

#### Kind of exam

written

#### 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

### Special case: Repetition exam as oral exam

#### Kind of exam

oral

#### Duration of exam

30 minutes

**Permissible aids**

No aids permitted