Module Description, available in: EN

Cloud Computing

General Information

Number of ECTS Credits

3

Module code

TSM_ClComp

Valid for academic year

2020-21

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 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:

	Zurich
Profile	CS

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 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 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

- 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 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

Special case: Resit exam as oral exam

Kind of exam

Oral exam

Duration of exam

30 minutes

Permissible aids

No aids permitted