**Studiengang**
Master Informatik

**Modulbezeichnung**
Cloud Computing

**Lehrveranstaltungen**
Cloud Computing

**Semester (WS / SS)**
SS

**Modulverantwortliche(r)**
Prof. Dr. Harald Richter

**Dozent(in)**
Prof. Dr. Harald Richter

**Sprache**
English

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### Work load in hours

<table>
<thead>
<tr>
<th>Lehrform</th>
<th>Semester Week Hours (SWS)</th>
<th>Own presence in lectures + self studying (1 LP = 30 h)</th>
<th>CP (1 LP = 30 h)</th>
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<tbody>
<tr>
<td>3V +1Ü</td>
<td>120+60=180</td>
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<td>6</td>
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### Voraussetzungen

**An introduction into computer networks**

### Lernziele

Afterwards, students will understand functions and foundations of Cloud Computing. They will know what a cloud can do, which cloud variations exist, and which underlying technologies are engaged. Additionally, they will get an overview about the two most important cloud implementations which are OpenStack and Amazon Web Services (AWS). By being open source or commercial, they are representing both branches of Cloud computing. The most important services from AWS and OpenStack are explained in detail, so that a thorough understanding of their functionalities can be achieved.

### Inhalt

1.) What is Cloud Computing? Which variations are possible?
2.) What are the pros and cons of Cloud Computing?
3.) Which implementations of Cloud Computing do exist?
4.) How does Cloud Computing work internally?
5.) Hardware virtualisation via KVM and QEMU
6.) Defining own virtual machine instances via Horizon, Virtio, QEMU and EC2
7.) Cloud Computing individually explained
   1.1.) Overview on OpenStack and its services
   1.2) Most important OpenStack services in detail
   2.2) Most important AWS services in detail
   3.2) Overview on AWS and its services
   4.2) Most important AWS services in detail

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### Studien-/Prüfungsleistungen

Examination: written

Admission to the examination:

6 out of 7 exercise home works must be submitted in due time, each with at least 1/3 of the achievable points

Physical presence in 6 out of 7 practical exercises

Presentation of parts of the given master solutions before the other students in the exercises

### Medienformen

Beamer multimedia presentation. Lectures and exercise tasks are provided for Internet download, Video recordings of the lectures are available as well under:
https://www.in.tu-clausthal.de/abteilungen/technische-informatik-und-rechnersysteme/lehre/

Additionally, master solutions to the exercises can be accessed in the online web portal of Prof. Richter (see below).

Finally, you will get in our OpenStack cloud an own virtual machine for learning by doing.

### Literatur

https://docs.openstack.org/ https://aws.amazon.com/de/

### Sonstiges

Each participant must sign the ‘Guidelines and Rules for the Ordered Implementation of the Exercises of Prof. Richter’. from C. Colditz, H. Richter, 20.11.2017. Afterwards, the participant can access via the Internet the official master solutions for every exercise, provided he/she has submitted the own solution beforehand.