inholland
university of applied sciences

Cloud Computing

Course guide 2024-2025

Semester	Fall (semester 1)
Inholland location(s)	Haarlem
Inholland faculty	Engineering, Design and Computing
Language of instruction	English
Cycle	Bachelor level
Number of ECTS	30

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Subjects

Subject title	ECTS	Course code
Cloud Databases	3	1920CLD01Z
Server Side Programming 1	3	1918MOBL2Z
Server Side Programming 2	3	
Project Cloud 1	2	1920CLD04Z
Research Cloud 1	2	1922CLD03Z
Microservices Architecture	2	
Project Cloud 2	13	1922CLD08Z
Research Cloud 2	2	1922CLD09Z

Content subjects

Over the past decade, server-side software deployment models have rapidly changed, and the availability of development services has greatly increased. Thorough knowledge of IaaS and PaaS solutions is vital to software developers specializing in backend software development.

This minor addresses these topics in a hands-on manner and teaches you how to develop serverless solutions. It consists of various classes and workshops with topics ranging from obtaining hands on experience with Microsoft Azure, to cloud database models, REST API design and testing, Continuous Integration / Continuous Delivery (CI/CD) and DevOps.

A general overview of the scope of the concepts of cloud computing is provided by the Cloud Computing course. The API Design course teaches you how to properly design and document an API based on the RESTful paradigm using OpenAPI (Swagger). The API Testing course provides you insights in how to perform automated tests on an API, and how to integrate this into a CI/CD pipeline.

In addition, students will develop skillsets necessary to deploy, maintain and scale software in a containerized environment (Kubernetes).

Microservice architectural styles that structure an application as a collection of services will be implemented with modern programming languages (Go and Python). A course in Cloud Databases allows you to differentiate between various options at hand for storing information in a scalable manner. Hands on experience is provided by several Azure development workshops.

The core of the minor consists of a group project for an external client (not for profit), which provides you the opportunity to seeing your backend being applied in practice.

Learning outcomes

Competences
1. Management
   - Managing and safeguarding a software development process
   - Setting up and executing management of a public of private cloud based infrastructure
   - Applying configuration- change, and release management
2. Analyzing
   - Exploring integration and migration difficulties
   - Specifying a distributed computer system consisting of timing, resource usage and performance
3. Designing
   - Setting up a technical design for an infrastructure
   - Designing a software system while taking into account existing components and libraries
   - Setting up a test strategy for system tests
   - Designing a distributed computer system, including setting up actuators, sensors, timing, resource usage and performance
4. Realizing
   - Setting up an infrastructure that meets demands in terms of performance, usability, security and compliance
   - Realizing a public or private cloud-based infrastructure and services while taking note of all requirements
   - Application of automated tests
   - Designing and applying an acceptation procedure, for example in a virtualized environment, including aspects related to timing, resource usage and performance

Goals
The student is able to:
   - Identify cloud deployment models and apply these models in a development process
   - Design an API using the RESTful paradigm
   - Model and document an API using OpenAPI (Swagger)
   - Differentiate between various cloud database models, and apply them to a software solution
   - Design and develop highly scalable serverless cloud solutions
   - Design, develop and deploy highly scalable cloud solutions
   - Cooperate with fellow students in software development activities
   - Effectively communicate with external clients (not for profit)

Mode of delivery, planned activities and teaching methods
   - Workshops by experts
   - Do research with your project group
   - Lectures on theory combined with practical exercises

Prerequisites and co-requisites
Bachelor ICT 3rd year with experience in programming.

Recommended or required reading and/or other learning recourses/tools
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Assessment methods and criteria

Details of assessments:

- Project assessment consisting of a specification review, code review and two presentations
- Individual code assessment
- Individual programming assignments
- Written exam on cloud computing theory

All assessments must be completed with a sufficient grade.

Lecturer(s)

Teachers of the Computer Science Haarlem study program and guest lectures and workshops by specialists from the field of cloud computing.

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