

Cloud Computing

Titulaires

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Mnémonique du cours

INFO-H505

Crédits ECTS

5 crédits

Langue(s) d'enseignement

Anglais

Période du cours

Deuxième quadrimestre

Campus

Solbosch

Contenu du cours

This introductory course provides a comprehensive overview of cloud computing, designed for students with little to no prior experience in the field. The course is structured in two parts, combining theoretical knowledge with practical insights and group-led seminars and projects.

Part 1: Foundations of Cloud Computing

The first part of the course covers essential concepts and foundational technologies that underpin cloud computing. Students will explore:

- > **Cloud Concepts Overview:** Understanding the fundamental principles and benefits of cloud computing.
- > **Cloud Economics and Billing:** Analyzing cost models, pricing structures, and financial benefits of cloud services.
- > **Cloud Architecture:** Learning about the design principles and patterns used in building cloud applications.
- > **Cloud Infrastructure Overview:** Examining the core components and services that form the cloud infrastructure.
- > **Cloud Security:** Investigating security principles, compliance, and best practices in the cloud.
- > **Networking and Content Delivery:** Exploring the network infrastructure, including DNS, CDN, and load balancing.
- > **Compute:** Understanding the various computing resources available in the cloud, such as virtual machines and serverless functions.
- > **Storage:** Analyzing different cloud storage solutions and their use cases.
- > **Databases:** Examining cloud-based database options and management.
- > **Auto Scaling and Monitoring:** Learning about automatic scaling, resource management, and monitoring tools to ensure optimal performance.

Part 2: Seminars, Group Presentations, and Projects

In the second part of the course, students will delve deeper into advanced topics through group-led seminars, presentations, and hands-on tutorials or demos. Each group will select a topic,

conduct research, and present their findings or demonstrate practical applications to the class. Topics for this segment include:

- **Virtualization & Containerization:** Understanding virtualization technologies and the role of containers in modern cloud environments.
- **Container Clusters:** Exploring orchestration and management of containerized applications using clusters.
- **Cloud Networking, Edge and IoT:** Analyzing advanced networking concepts and solutions in the cloud, and investigating the integration of edge computing and the Internet of Things (IoT) with cloud services.
- **Cloud Storage:** Diving deeper into specialized cloud storage solutions and their applications.
- **Serverless Computing:** Understanding the serverless architecture and its impact on application development.
- **Machine Learning in the Cloud:** Exploring machine learning services and frameworks available in the cloud.

As a member of the Amazon Web Services (AWS) Academy program, the course includes material and resources provided by AWS Academy. This affiliation provides students with access to AWS tools and learning resources, enhancing their understanding of cloud technologies through hands-on experience.

Group Project on AWS

In addition to the seminars and presentations, students will participate in a group project assignment on AWS. This project will involve designing, deploying, and managing a cloud-based application or service using AWS resources. The project will provide practical experience and reinforce the concepts learned throughout the course.

Objectifs (et/ou acquis d'apprentissages spécifiques)

By the end of this course, students will have a solid understanding of cloud computing principles, practical knowledge of key cloud services, and experience in presenting and discussing advanced cloud topics. This course prepares students for further studies in cloud computing and equips them with the skills needed to embark on a career in this rapidly growing field.

Méthodes d'enseignement et activités d'apprentissages

The course includes lectures, and student presentations and demonstrations.

Références, bibliographie et lectures recommandées

CLOUD COMPUTING TECHNOLOGY, Huawei Technologies Co., Ltd
https://link.springer.com/chapter/10.1007/978-981-19-3026-3_1

Autres renseignements

Lieu(x) d'enseignement

Solbosch

Contact(s)

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Méthode(s) d'évaluation

Examen écrit, Présentation orale et Projet

Examen écrit

Question fermée à Choix Multiple (QCM), Question fermée à Réponses Multiples (QRM) et Question fermée Vrai ou Faux (V/F)

Examen à livre ouvert

Construction de la note (en ce compris, la pondération des notes partielles)

Presentations: 6 points

Project: 6 points

Written Exam: 8 points

Langue(s) d'évaluation principale(s)

Anglais

Programmes

Programmes proposant ce cours à l'école polytechnique de Bruxelles

MA-IRIF | **Master : ingénieur civil en informatique** | finalité Spécialisée/bloc 2

