Content

Course Code	Course Name	Semester	Theory	Practice	Lab	Credit	ECTS
IT 538		3	4	0	0	3	8

Prerequisites	
Admission Requirements	

Language of Instruction	English
Course Type	Elective
Course Level	Masters Degree
Objective	The aim of this course is to study cloud computing as a distributed systems paradigm and to provide both theoretical and practical knowledge on virtualization, containerization, microservices architectures, Kubernetes, scalability engineering, observability, DevOps, cloud security, and cost optimization. The course equips students with the ability to design, deploy, and manage scalable, reliable, secure, and cost-efficient cloud-native systems.
Content	• Cloud as a Distributed Systems Paradigm • Virtualization and Containerization • Cloud Networking Architecture • Cloud Storage Systems • Scalability Engineering • Distributed Systems Deep Dive • Microservices Architecture • Kubernetes Architecture • Autoscaling & Scheduling • Observability & Reliability Engineering • DevOps & Infrastructure as Code • Cloud Security Architecture • Cloud Economics & Cost Engineering • Serverless & Edge Computing
References	1. Patni, Sakshi, Deepika Saxena, and Ashutosh Kumar Singh. Resource Management in Cloud Computing. 2025. 2. Ferreira, Haroldo. Cloud computing. Editora Senac São Paulo, 2025.

Theory Topics

Week	Weekly Contents
1	Cloud as a Distributed Systems Paradigm
2	Virtualization and Containerization
3	Cloud Networking Architecture
4	Cloud Storage Systems
5	Scalability Engineering
6	Distributed Systems
7	Microservices Architecture
8	Kubernetes Architecture
9	Autoscaling & Scheduling
10	Observability & Reliability Engineering

Week	Weekly Contents
11	DevOps & Infrastructure as Code
12	Cloud Security Architecture
13	Cloud Economics & Cost Engineering
14	Serverless & Edge Computing