Content

Course Code	Course Name	Semester	Theory	Practice	Lab	Credit	ECTS
VM 524	Graph Theory	3	4	0	0	3	8

Prerequisites	
Admission Requirements	

Language of Instruction	English
Course Type	Compulsory
Course Level	Masters Degree
Objective	This course introduces the fundamental principles of graph theory and explores its applications in data science. Students will learn how to represent, analyze, and manipulate various types of graphs to solve real-world problems in data analysis, network science, and machine learning.
Content	Fundamental Graph Theory Concepts: Paths and cycles, connectivity, trees, spanning subgraphs, bipartite graphs, Hamiltonian and Euler cycles. Graph Algorithms. Network Analysis. GCN (Graph Convolutional Networks). Data Science Applications.
References	

Theory Topics

Week	Weekly Contents
1	Introduction to Graphs
2	Graph Algorithms
3	Graph Properties and Metrics
4	Graph Visualization
5	Social Network Analysis
6	Recommender Systems
7	Midterm
8	Graphs in Machine Learning
9	Graphs in Machine Learning
10	Web and Text Mining
11	Advanced Topics