UNIVERSITÀ
DEGLI STUDI DI MILANO-BICOCCA

COURSE SYLLABUS

Graph theory and algorithms

2425-114R-06

Title

Graph Theory and Algorithms

Teacher(s)

Prof. Gianluca della Vedova

Prof. Marco Viviani

Language

English

Short description

The course is a graduate on introduction to Graph Theory, without a specific application in mind.

Lecture plan:

1. Connectivity (connected components, biconnected components, SPQR trees)
2. Walks, Paths, Trials, Cycles (Hamiltonian cycles, Eulerian cycles, TSP)

3. Graph Matching on general graphs.
4. Cuts
5. Graph Decomposition (Modular decomposition, cographs)
6. Treewidth, pathwidth, Twin-width
7. Graph Compression
8. Graph Mining (Intro & Graph Indexing)
9. Graph Mining (Graph Summarization & Graph Classification)
10. Graph Partitioning (and Clustering) & Complex Networks (graphs to represent complex systems and networks, small-world)

CFU / Hours

2 credits/16 hours

Teaching period

April-May 2025

Sustainable Development Goals