

Graph Theory and Social Network Analysis

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This course gives students an introduction to the methodology and tools used by data scientists in the context of social network analysis (SNA). It brings together ideas from graph theory, complex network analysis, and social sciences to give you a complete picture of network structures and how they work.

Here's a quick overview of the main topics we'll be covering:

- CRISP-DM methodology applied to social science problems using complex networks
- Fundamental concepts in graph theory and algorithms
- Centrality measures
- Community detection in networks
- Dynamics : Network models, Epidemic models
- Graph embeddings
- Application of networks analysis in sociology, management, and marketing
- Python-based libraries for network analysis

By the end of this course, students will be able to:

- [BC-03] Model and analyze real-world scenarios using graph theory and social network analysis techniques
- [BC-04] Apply the CRISP-DM methodology to formulate and solve social network problems
- [BC-07] Implement network analysis solutions using Python-based libraries for practical applications in various domains

Prerequisites :

- Being familiar and efficient with Python programming
- Being familiar with key libraries for Data Science like Pandas, NumPy
- Having basic skills in graph theory (Adjacency matrix and adjacency list, degree, density, path, BFS, DFS, Shortest paths and Dijkstra, Minimal spanning trees and Kruskal)