

(Introduction to) Network Analysis 2024/25

Week	Date	Lectures	Labs	Coursework
1	Feb 17th	Course motivation, graph theory vs network science, graphology	Recitation on <i>NetworkX</i> library, <i>Pajek</i> format etc.	
2	Feb 24th	Networkology, network representations & data, Erdos-Renyi model	Network representations, basic network algorithms	<i>Homework #1 out</i>
3	Mar 3rd	Configuration model, small-world networks & model, scale-free structure	Advanced network algorithms, random graph models	
4	Mar 10th	Scale-free networks & preferential attachment models, <i>course projects</i>	Small-world & scale-free models, graphs vs networks	
5	Mar 17th	Node position & measures of centrality, link analysis algorithms	Measures of node centrality, PageRank algorithm	
6	Mar 24th	Link importance & measures of bridging, networks in science, selected applications	Node similarity, link betweenness, errors & attacks	<i>Homework #1 due</i>
7	Mar 31st	Community structure, community detection & graph partitioning	Community structure & detection, benchmark graphs	<i>Homework #2 out</i>
8	Apr 7th	Node equivalence & blockmodeling, core-periphery structure	Blockmodeling & block models, k -core network decomposition	
9	Apr 14th	Node mixing in networks, fragments & frequent subgraphs	Node mixing by (not) degree, graphlet degrees	
10	Apr 21st	<i>/ (holiday)</i>	<i>/ (by agreement)</i>	
	Apr	Network sampling & comparison,	Random-walk sampling,	<i>Homework</i>

11	28th	backbones & (convex) skeletons	network comparison measures	#2 due
12	May 5th	Node layout & network visualization, selected applications	Board with pegs & bands, wiring diagrams, block models	
13	May 12th	Network inference & link prediction indices, graph machine learning	Node embeddings & classification, link prediction	
14	May 19th	Selected applications & research topics, <i>course challenges</i>	Selected analyses, review & examples of final exam	
15	May 26th	Course wrap-up, invited talk on network dynamics (Andreas Kaltenbrunner)	/ (<i>consultations</i>)	
16	Jun 2nd	/ (NetSci '25)	/ (NetSci '25)	<i>Course project due</i>