

(Introduction to) Network Analysis 2022/23

| Week | Date | Lectures | Labs | Coursework |
|------|----------|---|---|-----------------|
| 1 | Feb 13th | Networks motivation, graph theory vs network science, graphology | / | |
| 2 | Feb 20th | Networkology, network representations & data, Erdos-Renyi model | Recitation on <i>NetworkX</i> library, <i>Pajek</i> format etc. | Homework #1 out |
| 3 | Feb 27th | Configuration model, small-world networks & model, scale-free networks | Network representations, basic network algorithms | |
| 4 | Mar 6th | Scale-free networks & preferential attachment models, some applications | Advanced network algorithms, random graph models | |
| 5 | Mar 13th | / | / | Homework #1 due |
| 6 | Mar 20th | Node position & measures of centrality, link analysis algorithms | Small-world & scale-free models, graphs vs networks | |
| 7 | Mar 27th | Link importance & measures of bridging, perspectives & course projects | Measures of node centrality, PageRank algorithm | Homework #2 out |
| 8 | Apr 3th | Community structure, community detection & graph partitioning | Link betweenness, node similarity, errors & attacks | |
| 9 | Apr 10th | Node equivalence & blockmodeling, core-periphery structure | (coursework consultations) | |
| 10 | Apr 17th | Node mixing in networks, fragments & frequent subgraphs | Community detection, blockmodeling & k -cores | Homework #2 due |
| 11 | Apr 24th | / | Node degree mixing, graphlet degree | |

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|----|-------------|--|---|-----------------------|
| | | | distribution | |
| 12 | May 1st | Network sampling & comparison, backbones & skeletons | <i>(coursework consultations)</i> | |
| 13 | May 8th | Node layout & network visualization, dynamics of networks | Random-walk sampling, network comparison | |
| 14 | May 15th | Network inference & link prediction, graph machine learning | Wiring diagram & block models, PageRank challenge | |
| 15 | May 22nd | Applications of network analysis, (tentative) invited talks | Node embeddings & classification, link prediction | Course project due |
| 16 | May 29th | / | <i>(Q&A)</i> | |