Network Science (S37)
07 – 11 July 2025

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Day 1: Introduction to networks and network description

Day	Time	Type	Description	Location
Monday	09:00 - 09:30	Introduction	Introduction to the summer school & getting to know each other	Utrecht Science Park, exact location to be announced
	10:00 - 11:00	Lecture	Introductions to networks. Types of networks and types of analysis	
	10:30 - 11:45	Computer Lab	Load and visualize networks	
	11:45 – 12:00	Plenary Discussion	Participants and teachers discuss and present their solutions.	
	12:00 – 13:00	Lunch Break	In Educatorium	
	13:00 - 14:00	Lecture	Describing network positions and connection to social science theories	
	14:00 - 16.00	Computer Lab	Calculate centrality measures	
	16:00 - 16:30	Plenary Discussion	Participants and teachers discuss and present their solutions	

Day 2: Network formation models and community detection

Day	Time	Type	Description	Location
Tuesday	09:00 - 10:00	Lecture	Generative models and null models: random graphs, preferential attachment, small-world	
	10:00 - 11:30	Computer Lab	Testing hypothesis and comparing models	
	11:30 – 12:00	Plenary Discussion	Participants and teachers discuss and present their solutions.	
	12:00 – 13:00	Lunch Break	In Educatorium	
	13:00 - 14:00	Lecture	Community structure in networks	
	14:00 - 16.00	Computer Lab	Fitting a stochastic block model	
	16:00 - 16:30	Plenary Discussion	Participants and teachers discuss and present their solutions.	

Day 3: Statistical and machine learning approaches

Day	Time	Type	Description	Location
Wed	09:00 - 10:00	Lecture	Statistical Approaches to Network Analysis: REM, ERGM, SOAM.	
	10:00 - 11:30	Computer Lab	Relational Event Model (REM)	
	11:30 – 12:00	Plenary Discussion	Participants and teachers discuss and present their solutions.	
	12:00 – 13:00	Lunch Break	In Educatorium	
	13:00 - 14:00	Lecture	Node embeddings and GNNs	
	14:00 - 16.00	Computer Lab	Prediction challenge	
	16:00 - 16:30	Plenary Discussion	Participants and teachers discuss and present their solutions.	

Day 4: Network inference/reconstruction

Day	Time	Type	Description	Location
Thursday	09:00 - 10:00	Lecture	Introduction to Probabilistic Graphical Models	
	10:00 - 11:30	Computer Lab	Inferring networks using Graphical LASSO	
	11:30 – 12:00	Plenary Discussion	Participants and teachers discuss and present their solutions.	
	12:00 – 13:00	Lunch Break	In Educatorium	
	13:00 - 14:00	Lecture	Bayesian Networks	
	14:00 - 16.00	Computer Lab	Inferring networks using Bayesian Networks	
	16:00 - 16:30	Plenary Discussion	Participants and teachers discuss and present their solutions.	

Day 5: Dynamics in networks

Day	Time	Type	Description	Location
	09:00 - 10:00	Lecture	Information diffusion in social networks (Simple diffusion model)	
	10:00 - 11:30	Computer Lab	Simulation of simple diffusion and the strength of weak ties	
	11:30 – 12:00	Plenary Discussion	*Participants and teachers discuss and present their solutions.*	
	12:00 – 13:00	Lunch Break	In Educatorium	
	13:00 - 14:00	Lecture	Diffusion of complex behaviour in social networks (Threshold model)	
	14:00 - 16.00	Computer Lab	Simulation of complex behaviour in social networks through seeding	
	16:00 - 16:30	Plenary Discussion	*Participants and teachers discuss and present their solutions.*	

**For information about the Social Programme, please
visit the Utrecht Summer School website!**