

Complex Systems

Basic information

Code: SCI3066

Extent: 20 - 25 credits

Language: English

Teacher in charge: Jari Saramäki

Administrative contact: Päivi Koivunen

Target group: Master students with sufficient prerequisite knowledge

Application procedure: Open for all students of Aalto University

Quotas and restrictions: No quotas

Prerequisites: Elementary university-level mathematics: calculus, linear algebra, probability and statistics. Programming (knowledge of Matlab and/or Python will help).

Objectives

The aim is to introduce the student to the computational and theoretical background that is necessary for a quantitative understanding of complex systems, from the human brain to a diversity of biological and social systems. The skills learned here are helpful for students considering interdisciplinary scientific careers, or, e.g. for industrial data scientist positions.

Content and structure of the minor

Code	Name	Credits
Compulsory courses		10
MS-E2115	Experimental and Statistical Methods in Biological Sciences	5
CS-E5740	Complex Networks	5
Elective courses		10 - 15
Select as many courses as needed to fulfill the 20 - 25 credit requirement		
CS-E5795	Computational Methods in Stochastics	5
MS-C2111	Stochastic Processes	5
CS-E5745	Mathematical Methods for Network Science	5
MS-E2112	Multivariate Statistical Analysis	5
CS-E5755	Nonlinear Dynamics and Chaos	5
CS-E5700	Hands-On Network Analysis	5
CS-E3210	Machine Learning: Basic Principles	5
CS-E5710	Bayesian Data Analysis	5

