ID2224 Networks in Data Science 7.5 credits

Nätverk inom Data Science

This is a translation of the Swedish, legally binding, course syllabus.

Establishment

Course syllabus for ID2224 valid from Autumn 2016

Grading scale

A, B, C, D, E, FX, F

Education cycle

Second cycle

Main field of study

Computer Science and Engineering

Specific prerequisites

Language of instruction

The language of instruction is specified in the course offering information in the course catalogue.

Intended learning outcomes

The students will after the course

- be able to summarize and describe the main network models and research solutions that are basis for building structured and unstructured P2P overlays and Publish/subscribe systems
- be able to summarize and describe the fundamental concepts of spectral graph theory and apply them in practice for graph topology analysis
- be able to summarize and describe the fundamental concepts of random walk theory and its practical applications on the link analysis of social networks and the web
- be able to elaborate on and apply algorithms for massive linked data problems (e.g., graph clustering, community detection etcetera).

Course contents

- Main network models and their applications for P2P, Pub/Sub Systems
- Navigability in Structured and Unstructured Overlays
- Basics of Spectral Graph Theory
- Random Walks on Graphs
- Page Rank, Graph Clustering and Community detection, Social Network Analysis
- Algorithms for Massive Linked Data.

Course literature

The course is loosely based on the following books:

- John Hopcroft and Ravindran Kannan ” Foundations of Data Science” (2013)
- David Easley and Jon Kleinberg “Networks, Crowds, and Markets: Reasoning About a Highly Connected World” (2010)

Examination

- TEN1 - Examination, 4.5 credits, grading scale: A, B, C, D, E, FX, F
- LAB1 - Programming Assignments, 3.0 credits, grading scale: P, F

Based on recommendation from KTH’s coordinator for disabilities, the examiner will decide how to adapt an examination for students with documented disability.

The examiner may apply another examination format when re-examining individual students.

If the course is discontinued, students may request to be examined during the following two academic years.

Written examination. Laboratory tasks.

Ethical approach

- All members of a group are responsible for the group's work.
- In any assessment, every student shall honestly disclose any help received and sources used.
- In an oral assessment, every student shall be able to present and answer questions about the entire assignment and solution.