FAG3103 Network Analysis 7.5 credits

Nätverksanalys

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

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

Establishment

Course syllabus for FAG3103 valid from Spring 2016

Grading scale

Education cycle

Third cycle

Specific prerequisites

A masters degree in geoinformatics, computer science, operations research, or relevant science and engineering fields. Documented proficiency in English B or equivalent.

Language of instruction

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

Intended learning outcomes

Through reading assignments, lectures, seminars, and laboratory exercises, this course introduces doctoral students to what network or graph-theoretic algorithms are relevant to users of geographic information systems (GIS), how they are implemented in existing GIS, and how and what other algorithms should be incorporated in future GIS. Practical examples will be given to motivate the use of GIS for network analysis and the needs of efficient computational procedures for solving relevant problems.

Course contents

The course begins with the review of the capabilities of existing GIS, and then focuses on how to formulate relevant paths and flow problems, i.e., the shortest path algorithm, the maximum flow problem, and the minimum cost flow problem, and how to solve them algorithmically. Examples will be introduced and discussed in terms of their applications, complexities, and possible solution methods.

Course literature

Ravindra K. Ahuja, Thomas L. Magnanti, James B. Orlin, Network Flows: Theory, Algorithms, and Applications by, Prentice Hall, 1993.

Examination

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.

Other requirements for final grade

LAB1 - Laboratory Work, 3.0 credits, grade scale: P, F

PRO1 - Project, 4.5 credits, grade scale: P, F

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.