



# FAG3102 Computational Methods and Algorithms in GIS 7.5 credits

Algoritmer och beräkningsmetoder inom GIS

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 FAG3102 valid from Autumn 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

The major focus of this course is how to design, implement, and test algorithms for geographic information systems (GIS). Through reading assignments, lectures, seminars, and laboratory exercises, students should gain a good understanding of how GIS data and algorithms are designed, evaluated, and implemented, and also acquire computer programming skills useful to develop/extend GIS software and implement new GIS algorithms.

## Course contents

Geographic data modeling. Raster and vector data structures and algorithms. Formulation and solution of Combinatorial optimization problems in GIS.

## Course literature

C. D. Tomlin, 1990, Geographic Information Systems and Cartographic Modeling, Prentice Hall. Or, C. D. Tomlin, 2012, Geographic Information Systems and Cartographic Modeling, ESRI Press.

M. F. Worboys and M. Duckham, 2004. GIS: A Computing Perspective, 2nd edition. Taylor & Francis.

R. K. Ahuja, T. L. Magnanti, and J. B. Orlin, 1993, Network Flows: Theory, Algorithms, and Applications, Prentice Hall.

## 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.

