



LUND
UNIVERSITY

Faculty of Science

NGEN06, Algorithms in Geographical Information Systems, 7.5 credits

Algoritmer i geografisk informationsbehandling, 7,5 högskolepoäng
Second Cycle / Avancerad nivå

Details of approval

The syllabus was approved by Study programmes board, Faculty of Science on 2007-06-14 to be valid from 2007-07-01, autumn semester 2007.

General Information

Language of instruction: English

Main field of studies

Physical Geography

Depth of study relative to the degree requirements

A1N, Second cycle, has only first-cycle course/s as entry requirements

Learning outcomes

Knowledge and understanding

To pass the course, the student should be able to:

- explain the theory behind the basic algorithms (for raster, vector and graphs) that is used in geographic information processing,
- analyse spatial concepts and account for the definitions of these
- suggest an appropriate procedure to solve a geometric problem in geographic information processing
- describe how geographic data can be stored in a database and how an expanded SQL language can be used to search after geographic data
- thoroughly describe and derive empirical transformations in plane coordinate systems
- account for spatial data structures and
- account for methods for spatial indexing.

Skills and abilities

To pass the course, the student should be able to:

- program basic algorithms that are used in geographic information processing
- structure and solve geometric problems and
- communicate with a database designed for geographic data.

Assessment skills and approach

To pass the course, the student should:

- demonstrate a reflecting approach to possibilities and limitations in a GIS program.

Course content

In the basic courses, the students have got familiar with basic theory of GIS and learnt to use GIS as a tool in geographic analyses. The aim of this course is to give the underlying mathematical and computer science the theory to a GIS. This knowledge is necessary to evaluate the results in an analysis and to carry out more advanced analyses where the tools not are available in a standard GIS program. The lectures treat the basic theory to store geographic data in databases and the most important algorithms in a GIS . Exercises are mainly directed towards to treat geographic databases and to program algorithms. The course is completed with an individual project.

Course design

The teaching consists of lectures, laboratory sessions and project work. Participation in laboratory sessions and project work and thereby integrated other teaching is compulsory.

Assessment

Examination takes place in writing in the form of examination, and at oral and written presentation of the project. Students who have not passed the ordinary examination are offered a re-examinations shortly after.

Subcourses that are part of this course can be found in an appendix at the end of this document.

Grades

Marking scale: Fail, Pass, Pass with distinction.

The grades in the course are pass with credit, passed and failed.

To pass the entire course, approved examination and passed results of written assignments are required as well as completed project presentations and participation in all compulsory parts.

Entry requirements

For admission to the course, a Bachelor's degree in physical geography is required or the equivalent including 30 credits in GIS alternative three years' studies at faculty of engineering.

Further information

The course may not be included in a higher education qualification together with NGE612, Algorithms in geographic information processing 5p, GIS418 Algorithm theory in GIS, 5p, GISN07 Algorithm theory in GIS, 7.5 credits.

Subcourses in NGEN06, Algorithms in Geographical Information Systems

Applies from V08

0701 Algorithms in Geographical Information Systems, 7,5 hp
Grading scale: Fail, Pass, Pass with distinction