



LUNDS UNIVERSITET
Lunds Tekniska Högskola

Course syllabus

Geografisk informationsteknik - avancerad kurs

Geographic Information Technology - Advanced Course

EXTG25, 15 credits, A (Second Cycle)

Valid for: 2023/24

Faculty: Faculty of Engineering, LTH

Decided by: PLED L

Date of Decision: 2023-04-20

General Information

Main field: Disaster Risk Management and Climate Change Adaptation.

Elective for: MKAT2

Language of instruction: The course will be given in English

Aim

The aim of the course is to give advanced theoretical and practical knowledge within spatial analysis and geographic information processing.

Learning outcomes

Knowledge and understanding

For a passing grade the student must

- Explain basic methods and conceptual models of the contents of a geographic database
- Explain the principles of transformation between different geodesic reference system
- Explain concepts and calculation methods within advanced spatial analysis
- Explain basic logics of computer programming and describe how programming can be used with geographic data and problems
- Account for effects of data accuracy in geographic analysis and modelling
- Account for geographic data infrastructure in society
- Describe at a general level which laws that concern the use of geographic data

- Illustrate advanced using GIS within environment and society

Competences and skills

For a passing grade the student must

- Carry out interpolation with geographic data
- Carry out and present simple statistical evaluations of interpolated spatial data
- Independently suggest procedure and methods to solve complex geographic issues and to carry out these with GIS
- Present results of GIS analysis in writing and as maps for specialists and laymen in the subject
- Collect knowledge in the area in an independent way

Judgement and approach

For a passing grade the student must

- Compile, evaluate and discuss choice of analytical method to solve a given geographic problem
- Review and discuss the reliability of analyses with GIS critically
- Describe and evaluate using GIS in the society

Contents

The course contains a number of parts that are based on advanced use of existing software for database development, analysis and presentation of geographic information. The student develops the ability to structure and solve complex problems.

The course consists of the following parts:

- Advanced visualisation
- Data collection and format
- Database development
- Spatial autocorrelation
- Data quality and sources of errors
- Programming
- Course design

Course design

The course is a distance course and is distributed on the Internet, with a study pace of 50% over 2 study periods.

Examination details

Grading scale: UG - (U,G) - (Fail, Pass)

Assessment: Examination takes place through approval of written assignments during the course.

The examiner, in consultation with Disability Support Services, may deviate from the regular form of examination in order to provide a permanently disabled student with a form of examination equivalent to that of a student without a disability.

Admission

Admission requirements:

- EXTG20 Geographic Information Technology - Introduction or EXTG30 Geographic Information Technology - Basic Course

The number of participants is limited to: No

Selection: Students at the Masterprogram Disaster Risk Management and Climate Change Adaptation are guaranteed admission.

The course overlaps following course/s: NGEA12, GISA22, EXTG35

Reading list

- Harrie L. (red.): Geografisk informationsbehandling - teori, metoder och tillämpningar, 7:e upplagan. Studentlitteratur, 2020, ISBN: 9789144088778.
- Kang-Tsung Chang: Introduction to Geographic Information Systems. 2014, ISBN: 9781259010613. Later editions also works fine.
- INES: Exercise descriptions.
- Various articles.

Contact and other information

Course administrator: Karin Larsson, karin.larsson@nateko.lu.se

Course coordinator: Karin Larsson, karin.larsson@nateko.lu.se

Course homepage: <http://www.nateko.lu.se/extg25>

Further information: The course is only given within the Master Programme in Disaster Risk Management and Climate Change Adaptation.