

Course syllabus

Geografisk informationsteknik - grundkurs Geographic Information Technology - Basic Course

EXTG30, 15 credits, G2 (First 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 basic knowledge about concepts and methods for treatment and analysis of geographic data with geographic information systems, (GIS) and an introduction to cartography and geodesy.

Learning outcomes

Knowledge and understanding

For a passing grade the student must

- describe different conceptual models of spatial phenomena,
- describe different data models of digital spatial data (raster- vector), and know how these can be stored in computers
- account for basic spatial analytical methods account for basic cartographic methods
- explain the meaning of different map projections, geodesic reference systems and coordinate systems,
- explain basic interpolation methods,
- describe basic structure of relational databases.

Competences and skills

For a passing grade the student must

- organise and handle geographic data with computers independent and in groups
- carry out basic analyses of geographic data in raster and vector format using standard GIS software,
- present procedure and results from collection and analysis of geographic data in oral, written but above all as maps for specialists and laymen, carry out and present simple statistical evaluations of interpolated spatial data, use simple database managers (basic SQL), use simple navigation equipment (GPS) for collection of geographic data.

Judgement and approach

For a passing grade the student must

- had obtained a consciousness about the importance of, and self-confidence for, to use geographic information and analysis within natural sciences and other application fields,
- have achieved a critical approach to geographic data and analysis result.

Contents

The course gives a broad theoretical ground to wider work with digital geographic data. Understanding of representation and analysis of spatial elements are emphasised. The course also highlights general geographic problems within environment and society through practical GIS-applications. These treat both Swedish and international issues, and vary in scale from the local to the regional. The parts within GIS that is treated include basic cartography, including projections, reference system, geographic data in digital form (maps, images and tables) and positioning with GPS, basic analysis of geographic data in raster and vector format and cartographic and graphical presentation of digital map material. In the course, training in oral and written communication is also included. Special emphasis is placed on cartographic presentation of digital geographic data.

Course design

The teaching consists of lectures, computer exercises individual and in groups, field exercises and project work in groups. Computer exercises, field exercises and project work are compulsory.

Examination details

Grading scale: UV - (U,G,VG) - (Fail, Pass, Pass with Distinction)

Assessment: Examination consists of a written exam at the end of the course combined with assignments and project reports during the course. For students who have not passed the regular examination, additional examination in close connection to this is offered.

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.

Parts

Code: 0123. **Name:** Written Exam.

Credits: 7,5. **Grading scale:** TH. **Assessment:** Written examination graded according to TH. The grade will, together with the project work, decide the course grade. **Contents:** Written examination. **Further information:** For students who have not passed the regular examination, additional examination in close connection to this is offered.

Code: 0223. **Name:** Project Work.

Credits: 4. **Grading scale:** TH. **Assessment:** Passed project and poster as well as active participation at the presentation. **Contents:** A larger project work with extensive collection and analysis of geodata, as well as production of a conference poster with large emphasis on cartographic visualization.

Code: 0323. **Name:** Exercises and Hand-ins.

Credits: 3,5. **Grading scale:** UG. **Assessment:** Passed assignments from practical exercises. **Contents:** Compulsory practical exercises.

Admission

Admission requirements:

- General entry requirements and 60 credits scientific studies

The number of participants is limited to: 3

Selection: The course is given by the Faculty of Science. The Disaster Risk Management and Climate Change Adaptation program are guaranteed admission for 3 students at the course. Selection is based by ranking the number of completed credits within the Master Programme in Disaster Risk Management and Climate Change Adaptation. In case of equal qualification, the applicants will be selected by drawing of lots.

The course overlaps following course/s: EXTG20, NGEA11, GISA21

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.

Contact and other information

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

Course coordinator: Micael Runnström, micael.runnstrom@nateko.lu.se

Course homepage: <http://www.nateko.lu.se/extg30>

Further information: The date and time of the exam is announced by the course lecturer.