



Faculty of Science

GISA21, GIS: Geographical Information Systems - Introduction, 15 credits

GIS: Geografiska informationssystem - introduktion, 15 högskolepoäng
First Cycle / Grundnivå

Details of approval

The syllabus was approved by Study programmes board, Faculty of Science on 2013-03-21 and was last revised on 2026-05-31 by The Education Board of Faculty of Science. The revised syllabus comes into effect 2026-05-31 and is valid from the spring semester 2027.

General information

The course is a compulsory course at the basic level for a Master of Science in geographic information science.

Language of instruction: English

Main field of study

Geographical Information
Science

Specialisation

G1N, First cycle, has only upper-secondary level entry requirements

Learning outcomes

The aim of the course is to provide basic knowledge of concepts and methods for the treatment and analysis of geographic data with geographic information systems (GIS), and an introduction to cartography and geodesy. Presentation of analysis results by using maps is a strong emphasis and students in this course acquire knowledge of how to use maps in an efficient and correct fashion.

Knowledge and understanding

On completion of the course, the student shall be able to:

- describe different conceptual models of spatial objects and phenomena
- describe different data models for digital spatial data (the raster model and the vector model), and understand the structures and how data are stored digitally

- account for basic spatial analytical methods
- give an account of basic methods for cartographic visualisation and symbolisation
- explain different map projections, geodesic reference systems and coordinate systems
- describe basic language and structure in databases
- learn about the representation and analysis of three-dimensional surfaces in a GIS

Competence and skills

On completion of the course, the student shall be able to:

- organise and manage digital geographic data
- independently carry out basic analyses of geographic data in raster and vector format using standard GIS software
- present work procedures from collection and analysis to result presentation of geographic data in written form and through cartographic visualisation
- use simple database management systems (basic SQL)
- make use of data collected by remote sensing data in a GIS

Judgement and approach

On completion of the course, the student shall be able to:

- analyse and evaluate the use of geographic information in natural sciences, environmental studies, and spatial planning
- critically assess geographic data and analysis results

Course content

The course gives a broad theoretical foundation to prepare a student for working 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 deal with both Swedish and international conditions, and vary in scale from the local to the regional.

The parts within GIS that are examined include basic cartography and projections, reference systems, geographic data in digital form (maps, images and tables), basic analysis of geographic data in raster and vector format, and cartographic and graphical presentation of digital map material. Special emphasis is placed on the cartographic presentation of digital geographic data.

Course design

The course is fully online and delivered remotely with no physical meetings. Students are expected to participate under these conditions and to have access to an appropriate computer that can the required software, combined with a reliable internet connection, speakers, a microphone, and a webcam. The department

provides information about the technical requirements.

Occasional video meetings with the teacher may take place when clarification is needed. The course is offered on a full-time or part time basis, with some flexibility.

The course consists of several subject modules featuring video lectures, literature studies, and practical GIS analysis. Participation in the practical GIS analysis is compulsory.

Assessment

Examination takes place through written exam at the end of the course combined with written reports and assignments during the course.

Students who do not pass a regular assessment will be offered another opportunity for assessment soon thereafter once the required waiting period has elapsed.

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.

Grades

Grading scale includes the grades: Fail, Pass

For a Pass grade on the whole course, the student must have Pass grades on the written exam and written reports and assignments.

The grading scale for all course components is Fail, Pass.

Entry requirements

To be admitted to the course, students must meet general entry requirements. English proficiency equivalent to English 6/B from Swedish upper secondary school is required

Further information

This course may not be included in a higher education qualification with:

EXTG20 – GIS: Geographical Information Systems, Introduction, 15 credits

GISA01 – GIS: Geographical Information Systems, an Introduction, 10 credits

GISA02 – GIS: Geographical Information Systems, Advanced Course, 10 credits

GISA23 – GIS: Geographical Information Systems, Introduction 1, 7.5 credits

GISA24 – GIS: Geographical Information Systems, Introduction 2, 7.5 credits

NGEA11 – Physical Geography: Geographical Information Systems, Basic Course, 15 credits

NGEA31 – Physical Geography: Geographical Information Systems, Basic Course, 15 credits

The course is offered at the Department of Earth and Environmental Sciences, Lund University.