



Faculty of Science

## GISN41, GIS: GIS and Statistical Analysis, 7.5 credits

*GIS: GIS och statistisk analys, 7,5 högskolepoäng*

Second Cycle / Avancerad nivå

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### Details of approval

The syllabus was approved by The Education Board of Faculty of Science on 2024-06-03. The syllabus comes into effect 2024-06-03 and is valid from the spring semester 2025.

### General information

The course is an elective course for second-cycle studies for a Degree of Master of Science in geographic information science.

*Language of instruction:* English

*Main field of study*

*Specialisation*

Geographical Information Science

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

### Learning outcomes

The general aim of the course is that the student should have acquired detailed knowledge in basic statistical methods with special focus on geographic data when the course is completed. The course deals with distributions, populations, statistical analysis and error propagation.

### Knowledge and understanding

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

- explain correlation and regression analysis
- explain hypothesis testing on geographical data,
- at a general level, describe the error propagation that can occur in geographic analysis
- explain spatial autocorrelation
- give examples when to use regional variable theories.

## Competence and skills

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

- interpret and discuss geographic data from a statistical perspective thoroughly,
- use and explain statistical measures,
- independently carry out analyses and interpret results from correlation and regression analyses,
- apply special spatial methods on applicable data, for example by use of a modern geostatistical package enabling interactive exploration of spatial correlations among multiple variables,
- plan and carry out a hypothesis test
- carry out a geostatistical analysis by applying regional variable theory.

## Judgement and approach

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

- independently evaluate and interpret both spatial and common statistical measures and methods,
- evaluate the reliability in analyses implemented with different statistical methods.

## Course content

The course treats:

- Descriptive statistics
- Data and populations
- Correlation analysis
- Simple linear regression
- Multiple regression analysis and trend surfaces
- Spatial regression
- Spatial distributions and clusters
- Hypothesis test
- Regional variable theory

## Course design

The teaching consists of Internet-based video lectures, exercises and a project. The exercises and project are compulsory.

The course is a distance course and is distributed on the Internet. It is assumed that the student participates under these conditions and has access to a computer with an internet connection and working speakers and microphone and webcam. The institution will provide information on the technical requirements.

The course is flexibly designed giving the student options to carry out the course at full time or half time study tempo.

## **Assessment**

Examination is done by written assignments and through a project conducted during the course.

Students who do not pass an assessment will be offered another opportunity for assessment soon thereafter.

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

To pass the whole course, passed written assignments and passed project work are required.

## **Entry requirements**

Entry to the course requires general entry requirements, English B/6 and 90 credits scientific studies, including 30 credits in GIS. Equivalent knowledge acquired in a different way, also gives admission to the course.

## **Further information**

The course cannot be credited in the degree together with GISN02, GIS and statistical analysis, 7,5 credits, GISN21, GIS and statistical analysis, 5 credits or GISN31, GIS and statistical analysis, 5 credits.

The course is given by the Department of Physical Geography and Ecosystem Science, Lund University.