



Faculty of Health, Science and Technology  
Geo-Science

# Syllabus

## Geographical Informations Systems I

<b>Course Code:</b>	NGGA23
<b>Course Title:</b>	Geographical Informations Systems I <i>Geografiska informationssystem I</i>
<b>Credits:</b>	7.5
<b>Degree Level:</b>	Undergraduate level
<b>Progressive Specialisation:</b>	First cycle, has less than 60 credits in first-cycle course/s as entry requirements (G1F)

### Major Field of Study:

MAT (Surveying and Mapping)  
NGA (Physical Geography)

### Course Approval

The syllabus was approved by the Faculty of Health, Science and Technology 2022-08-30, and is valid from the Spring semester 2023 at Karlstad University.

### Prerequisites

Registered for Introductory Mathematics, 7.5 ECTS credits, or Mathematics for Engineers I, 7.5 ECTS credits, and 3 ECTS credits completed in Introduction to GIS and Cartography (7.5 ECTS credits), or equivalent

### Learning Outcomes

Upon completion of the course, students should be able to:

- demonstrate basic theoretical knowledge of geographic analysis,
- give an account of the infrastructure of geographic information in Sweden,
- give an account of the concepts and definitions used in the field,
- use and process geographic data,
- carry out a minor GIS project, and
- give an account of how it is possible to use GIS and geodata to work for sustainable

development.

### **Content**

The course includes both theoretical and practical components in the form of course reading and exercises that are assessed in the form of hand-in assignments. The course is divided into three parts: theory, exercises, and a project.

The course covers central concepts and definitions. Lectures and course reading are supplemented with an introduction to common GIS software, including introductory exercises designed to help students learn a particular software programme, deepen their knowledge, and apply their knowledge in practice. The course also covers functions and areas of use for advanced vector-based GIS. In addition, the course focuses on spatial information in databases as well as data quality with regard to accuracy and resolution. Students learn about the structure of geographic data in various formats, data editing, analyses, and how to present results. Students are also introduced to ongoing processes of development and standardisation in the field.

An important aim of the course is for students to develop an understanding of the role of geographic information today and the available infrastructure for geographic information, such as:

- institutional frameworks (such as legislation)
- standards, specifications, and guidelines for using geographic data
- regulations pertaining to the basic geographic data needed in society
- technological infrastructure
- research, development, and education

The use of geographic information systems in different areas, such as the environment, physical planning, risk and safety, health care, and business, is exemplified. An overview of how geographic information is regulated by EU directives is also provided.

Finally, students undertake a project in which they apply the theoretical knowledge acquired. Students complete a group project in which they investigate how it is possible to use GIS and geodata to work for sustainable development.

### **Reading List**

See separate document.

### **Examination**

Assessment is based on an individual written take-home exam, individual hand-in assignments, an individual written project report, and a group project presented orally.

If students have a decision from Karlstad University entitling them to Targeted Study Support due to a documented disability, the examiner has the right to give such students an adapted examination or to examine them in a different manner.

### **Grades**

One of the grades Pass with Distinction (5), Pass with Some Distinction (4), Pass (3), or Fail (U) is awarded in the examination of the course.

### **Quality Assurance**

Follow-up relating to learning conditions and goal-fulfilment takes place both during and upon completion of the course in order to ensure continuous improvement. Course evaluation is partly based on student views and experiences obtained in accordance with

current regulations and partly on other data and documentation. Students will be informed of the result of the evaluation and of any measures to be taken.

**Course Certificate**

A course certificate will be provided upon request.

**Additional information**

The course NGGA23 cannot be included in the same degree programme as the course NGGAD1.

The local regulations for studies at the Bachelor and Master levels at Karlstad University stipulate the obligations and rights of students and staff.