



Faculty of Health, Science and Technology  
Mathematics

## Syllabus

### Mathematics with specialisation in surveying technology

<b>Course Code:</b>	MAGA49
<b>Course Title:</b>	Mathematics with specialisation in surveying technology <i>Matematik med inriktning lantmäteriteknik</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:**  
MAA (Mathematics)

#### Course Approval

The syllabus was approved by the Faculty of Health, Science and Technology 2023-08-28, and is valid from the Spring semester 2024 at Karlstad University.

#### Prerequisites

Registered for Mathematics for Engineers I, 7.5 ECTS credits, or equivalent

#### Learning Outcomes

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

- use derivatives in calculations and problem solving,
- use vector geometry and trigonometry to solve problems regarding distances and angles on a spherical surface,
- apply concepts and methods in descriptive statistics, carry out basic probability calculations, and use the normal distribution to solve applied problems,
- control results and assess whether they are plausible and correct, and

- demonstrate understanding by being able to combine various concepts, theorems, and experiences of problem solving, recognise analogies, and make generalisations.

### **Content**

The course includes the following main topics:

- Definition of the derivative and derivative rules. Applications such as qualitative curve construction, extreme value problems, and Taylor's formula.
- Repetition of trigonometric relationships and vectors. Spherical geometry and trigonometry.
- Introduction to probability theory, descriptive statistics, different measures of average, dispersion, and dependency, linear regression, and a few common distributions, for instance the normal distribution.

### **Reading List**

See separate document.

### **Examination**

Assessment is based on an individual written exam and an individual hand-in assignment.

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 5 (Pass with Distinction), 4 (Pass with Some Distinction), 3 (Pass), and U (Fail) 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 local regulations for studies at the Bachelor and Master levels at Karlstad University stipulate the obligations and rights of students and staff.