



Faculty of Health, Science and Technology  
Mathematics

# Syllabus

## Geometry, trigonometry, and statistics

<b>Course Code:</b>	MAGA83
<b>Course Title:</b>	Geometry, trigonometry, and statistics <i>Geometri, trigonometri och statistik</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 2025-03-04, and is valid from the Autumn semester 2025 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:

- apply basic concepts in vector algebra in two and three dimensions,
- use classical geometry, vector geometry, and trigonometry to solve problems related to distances and angles in the plane, space, and on a spherical surface,
- apply concepts and methods in descriptive statistics, perform fundamental calculations in probability theory, and use the normal distribution to solve applied problems,
- combine various concepts, theorems, and problem-solving experiences, identify analogies and make generalisations, and
- assess the reasonableness of results and partial results, and, where possible, verify their accuracy.

**Content**

The course covers the following:

- Vectors in the plane and space, scalar and vector product, equations for lines and planes, distances between points, lines, and planes in space.
- Elementary Euclidean geometry and trigonometry.
- Spherical geometry and trigonometry.
- Descriptive statistics, measures of central tendency, and measures of dispersion.
- Basic probability theory.
- Some discrete and some continuous distributions, e.g., the normal distribution.
- Expected value, variance, standard deviation.
- Point estimates and confidence intervals.

**Reading List**

See separate document.

**Examination**

Assessment is based on a written exam.

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 Distinction (VG), Pass (G), or Fail (U) is awarded in the examination of the course. For students in Engineering, one of the grades 5 (Pass with Distinction), 4 (Pass with Some Distinction), 3 (Pass), or 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.