



Faculty of Health, Science and Technology
Mathematics

Syllabus

Mathematics of Surveying and Mapping

Course Code:	MAGA19
Course Title:	Mathematics of Surveying and Mapping <i>Matematik för mät- och kartteknik</i>
Credits:	7.5
Degree Level:	Undergraduate level
Progressive Specialisation:	First cycle, has only upper-secondary level entry requirements (G1N)

Major Field of Study:
MAA (Mathematics)

Course Approval

The syllabus was approved by the Faculty of Health, Science and Technology 2024-03-07, and is valid from the Autumn semester 2024 at Karlstad University.

Prerequisites

General admission requirements and upper secondary level Mathematics 3, or equivalent

Learning Outcomes

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

- use the trigonometric functions in problem solving, such as triangle solving, equation solving, and curve construction,
- apply differentiation rules to derive sums, differences, products, quotients, and compositions of elementary functions,
- relate derivative properties to function behaviour, such as monotonicity and extreme values,
- calculate partial derivatives of simple multidimensional functions,
- perform basic probability calculations and use the normal distribution to solve applied problems,

- perform calculations with elementary matrix algebra,
- combine different concepts, theorems, and problem-solving experiences, recognising analogies and making generalisations, and
- assess the reasonableness of results and partial results and verify correctness where possible.

Content

- Basic trigonometry.
- Derivatives of elementary functions and differentiation rules for sums, products, quotients, and composite functions.
- Interpretation of first and second-order derivatives.
- Partial derivatives.
- Sum and integral notation.
- Introductory probability theory, descriptive statistics, various measures of location, spread, and dependence, linear regression, and some common distributions (e.g., the normal distribution).
- Matrices and matrix inverses.

Reading List

See separate document.

Examination

Assessment is based on individual hand-in assignments and a written exam. The number of examination opportunities for passing the course is limited to three per academic year.

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.