



Faculty of Health, Science and Technology
Mathematics

Syllabus

Applied Mathematics

Course Code:	MAGA48
Course Title:	Applied Mathematics <i>Tillämpad matematik</i>
Credits:	7.5
Degree Level:	Undergraduate level
Progressive Specialisation:	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 2026-01-30, and is valid from the Autumn semester 2026 at Karlstad University.

Prerequisites

Mathematics for Engineers I (7.5 credits) or Mathematics for Engineers II (7.5 credits). An equivalence assessment can be made.

Learning Outcomes

Upon completion of the course, students should be able to

- determine eigenvalues and eigenvectors,
- apply solution methods for ordinary differential equations and systems of ordinary linear differential equations,
- calculate partial derivatives and use these to solve problems,
- apply concepts and methods in descriptive statistics, perform basic calculations in probability theory, and use normal distribution to solve applied problems,
- combine different concepts, theorems, and problem-solving experiences, as well as identify analogies and make generalisations, and
- assess the reasonableness of results and intermediate results, and, where possible, verify their accuracy.

Content

The course covers the following:

- Some basic properties and applications of vectors, matrices, eigenvalues, and eigenvectors.
- Linear ordinary differential equations of higher order, systems of linear ordinary differential equations.
- Functions of several variables, partial derivatives, directional derivative, gradient, and some simple partial differential equations.
- Descriptive statistics, measure of location, and measures of dispersion.
- Basic probability theory.
- Some discrete and some continuous distributions, e.g., the normal distribution.
- Expectation value, variance, standard deviation.
- Point estimates and confidence intervals.

Reading List

See separate document.

Examination

Assessment is based on an individual 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 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 local regulations for studies at the Bachelor and Master levels at Karlstad University stipulate the obligations and rights of students and staff.