Reg No: MAGA47/20252

Faculty of Health, Science and Technology
Mathematics

Syllabus

Mathematics for Engineers III

Course Code:	MAGA47
Course Title:	Mathematics for Engineers III *Matematik för ingenjörer III*
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 2025-03-04, and is valid from the Autumn semester 2025 at Karlstad University.

Prerequisites
Registered for Mathematics for Engineers I-II, 15 ECTS credits, with at least 7.5 ECTS credits completed, or equivalent

Learning Outcomes
The aim of the course is for students to acquire the tools needed in the areas of transform theory and statistics to study basic electrical engineering, control theory, and signal processing.

Upon completion of the course, students should be able to:
- calculate the Fourier series of a periodic function and the Fourier transform of a function,
- solve linear differential equations using the Laplace transform,
- solve linear difference equations using the Z-transform,
- apply concepts and methods in descriptive statistics,

- perform basic calculations in probability theory, and
- use common probability distributions to solve applied problems.

Content
Transform theory:
- The Laplace transform and solving differential equations,
- The Z-transform and solving difference equations,
- Fourier series of periodic functions,
- The complex form of the Fourier transform.

Probability and Statistics:
- 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 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.