



Faculty of Health, Science and Technology  
Mathematics

# Syllabus

## Introduction to Mathematics

<b>Course Code:</b>	MAGA09
<b>Course Title:</b>	Introduction to Mathematics <i>Inledande matematik</i>
<b>Credits:</b>	7.5
<b>Degree Level:</b>	Undergraduate level
<b>Progressive Specialisation:</b>	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 2019-02-15, and is valid from the Autumn semester 2019 at Karlstad University.

### Prerequisites

Upper secondary school Mathematics 3, or equivalent

### Learning Outcomes

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

- simplify, handle, and process algebraic calculations in a reliable way,
- solve power, exponential and logarithm equations,
- use the unit circle to define trigonometrical concepts and prove trigonometrical relations,
- use formulas to transpose trigonometrical expressions,
- solve trigonometrical equations and draw graphs for trigonometrical functions,
- calculate sides and angles in triangles,
- quote, explain, and use the definition of the derivative,

- recognise and use the different notations for first and second derivatives,
- differentiate products, quotients, and composite functions,
- carry out function investigations and determine extreme values and intervals for increasing and decreasing,
- determine the antiderivative,
- write down and use integrals in different applications, for example area calculations.

### **Content**

Algebraic calculation and handling of variables. Trigonometry. The function concept and the elementary functions. Derivatives, graph drawing, and extreme values. Antiderivatives and integrals with applications.

### **Reading List**

See separate document.

### **Examination**

Assessment is based on a written exam. The number of examination opportunities for passing the course is limited to three per academic year.

### **Grades**

One of the grades U (Fail), G (Pass), or VG (Distinction) or, for students registered in an Engineering programme, one of the grades U (Fail), 3 (Pass), 4 (Pass not without distinction), or 5 (Pass with distinction) 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.