



Board of Teacher Education  
Mathematics

# Syllabus

## Mathematics and Mathematics Teaching V

<b>Course Code:</b>	MAAL15
<b>Course Title:</b>	Mathematics and Mathematics Teaching V <i>Matematik V med didaktisk inriktning</i>
<b>Credits:</b>	22.5
<b>Degree Level:</b>	Master's level
<b>Progressive Specialisation:</b>	Second cycle, has only first-cycle course/s as entry requirements (A1N)

**Major Field of Study:**  
MAA (Mathematics)

### Course Approval

The syllabus was approved by the Board of Teacher Education 2019-02-11, and is valid from the Autumn semester 2019 at Karlstad University.

### Prerequisites

MAGL13, including at least 20 ECTS credits completed, or equivalent

### Learning Outcomes

The aim of the course is that students develop advanced knowledge of mathematics and mathematics education relevant for the teaching profession. The course comprises two course modules.

Module 1, Mathematics teaching specialisation, 7.5 ECTS cr

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

1. give an account of and discuss different mathematics education theories,
2. analyse teaching situations in relation to relevant mathematics education research,
3. critically examine scholarly sources on mathematics education, and

4. plan a series of mathematics lessons for upper or lower secondary school and analyse content and procedure, both in terms of subject theory and in terms of relevant mathematics education research.

Module 2, Independent project, 15 ECTS cr

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

1. perform a literature review and use it to gain up-to-date knowledge about an area of mathematics as well as relevant pedagogical aspects,
2. give an account of and use the mathematical theories that underpin the chosen area, and use relevant digital tools, and
3. plan a series of teaching components for upper secondary school, utilizing digital tools, focused on the chosen area of study and well grounded in steering documents and current research.

## **Content**

Module 1, Mathematics teaching specialisation, 7.5 ECTS cr

This module offers specialisation in learning and teaching mathematics. Mathematics education theories are studied, compared, and used as tools to analyse teaching situations. Students should find, read, examine, and discuss research articles on mathematics education. A series of mathematics lessons is planned, discussed, and analysed on the basis of knowledge gained from previous courses on subject theory and subject-specific teaching. Aspects covered include connections to the curriculum concerning core content and various skills to develop, individualisation, different approaches, assessment, and the use of digital tools.

Module 2, Independent project, 15 ECTS cr

The module consists of an independent project. The mathematical problem examined by the student is decided in consultation with the supervisor. The project includes both advanced study of subject theory related to an area of mathematics and an examination of the chosen area from a school perspective.

The chosen area must be advanced in relation to previous mathematics courses in the programme. The following are examples of suitable areas for investigation: Mathematical modelling, non-Euclidean geometry, numerical calculation methods, linear optimisation, coding theory, classical mathematical problems, algorithms and data structures.

## **Reading List**

See separate document.

## **Examination**

Assessment of Module 1 is based on

1. An individual written take-home examination (learning outcomes 1 and 2)
2. A literature seminar (learning outcomes 1 and 2)
3. An oral presentation in seminar form (learning outcome 3)
4. An individual written report (learning outcome 4)
5. An oral presentation and critical examination of another student's work at a final seminar (learning outcome 4)

Assessment of Module 2 is based on

An individual oral presentation of the chosen area of mathematics in class (learning outcome 2)

An individual written report, presented orally at a final seminar (learning outcomes 1, 2, and 3)

## **Grades**

One of the grades Distinction (VG), Pass (G), 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.