



Board of Teacher Education  
Mathematics

## Syllabus

### Creative Mathematics for teaching in grades 4-6

<b>Course Code:</b>	LPGG05
<b>Course Title:</b>	Creative Mathematics for teaching in grades 4-6 <i>Kreativ matematik för grundlärare i årskurs 4-6</i>
<b>Credits:</b>	30
<b>Degree Level:</b>	Undergraduate level
<b>Progressive Specialisation:</b>	First cycle, has less than 60 credits in first-cycle course/s as entry requirements (G1F)

#### Major Field of Study:

#### Course Approval

The syllabus was approved by the Board of Teacher Education 2017-09-04, and is valid from the Spring semester 2018 at Karlstad University.

#### Prerequisites

Admission to Teacher Education Programme: Upper primary school

#### Learning Outcomes

The aim of the course is that students reinforce and enhance their knowledge in mathematics and develop the subject-specific methodology required to teach mathematics in primary school. Students are expected to develop a professional approach and reflect on their professional role as maths teachers and to study and reflect on current research and development in mathematics education.

The aim of the practical placement component is that students are introduced to school practice and develop professional knowledge by reflecting on the relationship between theory and practice.

Module 1 Teaching mathematics from a teacher and pupil perspective, 22.5 ECTS cr

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

1. apply and explain basic mathematical concepts in number sense and arithmetics,
2. apply and explain basic mathematical concepts in algebra, geometry, functions, probability and statistics,
3. describe parts of the historical development of mathematics and exemplify how to illustrate this for children,
4. plan and evaluate different approaches, such as aesthetic learning processes, to stimulate creativity and the joy of discovery in mathematics,
5. use correct and relevant mathematical language in speech and writing,
6. give an account of the role of language and communication in developing and learning mathematical concepts,
7. describe the central role of problem solving in teaching mathematics,
8. review educational research with relevance to mathematics teaching.

## Module 2 Practical Placement 1, 7.5 ECTS cr

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

1. act in accordance with the foundational values stipulated in the Swedish Education Act and the national curriculum,
2. explain the meaning of current legislation concerning professional confidentiality and the obligation to report irregularities, in relation to educational settings,
3. reflect on how equality perspectives can be integrated in educational activities,
4. communicate professionally with students and staff, both one-on-one and in groups, and both orally and in writing, in ways that are both functional and adequate,
5. under supervision plan and conduct some teaching periods according to the national policy documents as well as relevant subject knowledge and subject-specific pedagogical theories,
6. describe the policies of special education and student welfare efforts in school on the basis of local examples,
7. describe and reflect on their own teaching, in relation to the national policy documents, relevant subject knowledge, and subject-specific pedagogical theories, and
8. give an account of their own professional development and identify their need of further development.

## Content

### Module 1 Teaching mathematics from a teacher and pupil perspective, 22.5 ECTS cr

Mathematics as a science and a school subject is introduced and the emergence of mathematics in school described and discussed. Relevant curricula are analysed. Mathematics teaching is treated from different perspectives: societal, cultural and historical. Furthermore, critical steps in children's mathematical development are discussed.

The central knowledge areas of school mathematics are studied from a teaching as well as a subject theoretical perspective. Arithmetic in different numeric ranges is treated in terms of children's basic conceptions of numbers. Numerical systems in historical cultures are treated with an emphasis on the position system. The role of algebra in teaching mathematics is studied with a focus on algebraic expressions and equations as well as foundational ideas on the concept of function. Different forms of representations and laboratory material, for example, fraction operations are analysed. Geometrical objects and concepts are discussed in an educational perspective. Probability and statistics are discussed in terms of everyday situations. Problem-solving and various strategies for solving problems are treated.

Artistic presentations and diversity aspects in mathematics teaching are discussed and analysed. Different digital learning resources and basic programming are introduced and discussed. Research and theories in mathematics education are introduced.

Students are prepared for the practical placement period.

### Module 2 Practical Placement I, 7.5 ECTS cr

Students have the opportunity to

- meet different groups of staff, for example, teaching teams, student welfare personnel and school management,
- apply national curricula and local directives with consideration given to equality and equity,
- participate in everyday activities, apply central regulations and guidelines and local pedagogical planning with consideration of equality and equal opportunities policies,
- apply subject-specific teaching theories and transform relevant subject knowledge into teaching and reflect on the relation between theory and practice,
- use ICT in their teaching,
- make observations,
- discuss and reflect on the profession and professional development,
- describe special education and student welfare efforts in school,
- acquire knowledge of legislation pertaining to confidentiality and obligation to notify irregularities.

**Reading List**

See separate document.

**Examination**

Assessment is based on:

Module 1:

Learning outcomes 1 and 2: written exam

Learning outcomes 3-8: hand-in assignments and oral presentations.

Material submitted for assessment must clearly indicate individual contributions.

Module 2:

Learning outcomes 1, 4 och 5: completed and documented practical placement.

Learning outcomes 2, 3, 6, 7 and 8: oral and/or written assignments at the university

Attendance is required for the introduction to and the school placement component. The occasional day of absence can be completed on agreement with the module convener. Students who fail to attend more than five days will have to retake the whole module, unless there are special circumstances.

The number of examination opportunities for the practical placement component is limited to two.

Supplementary examination is permitted.

**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.