Mathematics (1-15 cr)

Programme course

15 credits

Matematik (1-15 hp)

91MA11

Valid from:

Determined by
The Board of Educational Science

Date determined
2012-01-09

Main field of study
Mathematics

Course level
First cycle

Advancement level
G1X

Course offered for
- Secondary School Teacher Programme with a specialization in Teaching in the Upper-Secondary School, subject Internationell Mathematics
- Secondary School Teacher Programme with a specialization in Teaching in the Upper-Secondary School, subject Mathematics

Entry requirements
Specific entry 6c and Ma D and participated in General Education, 5 credits, Development and Learning, 10 credits, skills assessment and grading, 7.5 credits and education history, the school's role in society and values, 7.5 credits, or equivalent.

Intended learning outcomes
After completing the course, students will be able to
- Read and interpret mathematical texts in arithmetic, algebra, geometry, and initial function theory
- Formulate and explain basic concepts, laws and theorems in arithmetic, algebra, geometry and function theory
- Solve problems in arithmetic, algebra, geometry, and function learning by applying key concepts, theorems and methods
- Perform standard calculations
- Check the results to verify that these are correct, or reasonable
- Describe the didactic aspects of the school's central concepts, operations, theorems and methods in arithmetic, algebra, geometry and function theory.
- Use of laboratory and technical facilities in Mathematics, including computer software in geometry.

Course content

The course covers general numeracy, basic mathematical concepts, properties of elementary functions and classical geometry, specifically: Calculation with numeric and algebraic expressions, inequalities, absolute value, and complex numbers. Solving equations, algebraic equations, functions and graphs. Definition and basic properties of, the elementary functions. Basic principles of logical reasoning and evidence. Coordinate systems in the plane, polar coordinates, equations of straight lines and circles. Complex plane, complex numbers in Cartesian and polar form, Euler and de Moivre formulas. Geometric and arithmetic sum. Binomial theorem. Number systems: natural, whole, rational, real and complex numbers, the positioning system. Polynomials: divisibility, zeros and factor theorem, real polynomials, methods for solving equations.
Euclidean geometry based on axioms: congruence and similarity, basic geometric theorems as the Pythagorean theorem, sine and cosines, the peripheral angle theorem, the intersecting chords theorem, the angle bisector theorem. Elements of tesselations.

Beginning with basic definitions and axioms, and using logical reasoning and evidence, as well as skills training in the form of both exercises and theoretical reasoning, the students work on solving tasks, choose the appropriate solution once, examine and explain mathematical relationships, as well as illustrate and present solutions.

Students also work with computer labs, which highlights the geometric properties.

Students will also didactic analyzes included in the course school relevant mathematical concepts and methods, focusing on multiple representations and explanations.

Teaching and working methods

Lectures, seminars, computer labs, and independent studie

Examination

The course is assessed through a written exam and written presentation.

EXAM CODES
STN1 Written exam: written examination Algebra part 1, 2 credits (U, G)
STN2 Written exam: written examination Algebra part 2, 4 credits (U, G)
STN3 Written exam: written examination Algebra, 6 credits (U, G, VG)
SRE1 Written presentation: Algebra 1,5 credits (U, G)
STN4 Written exam: written examination Geometry, 6 credits (U, G, VG)
SRE2 Written report: Didactic analysis, 1.5 credits (U, G)

Algebra (which includes arithmetic and function theory) is examined either with STN1 and STN2 or with the summary exam STN3

Grades
Three-grade scale, U, G, VG

Other information
Planning and implementation of a course must take its starting point in the wording of the syllabus. The course evaluation included in each course must therefore take up the question how well the course agrees with the syllabus. The course is carried out in such a way that both men´s and women´s experience and knowledge is made visible and developed.

Department
Matematiska institutionen