



DEPARTMENT OF MATHEMATICAL SCIENCES

MMG020 Preparatory Course in Mathematics, 7.5 credits

Förberedande kurs i matematik, 7,5 högskolepoäng

First Cycle

Confirmation

This course syllabus was confirmed by Department of Mathematical Sciences on 2014-11-27 and was last revised on 2020-08-20 to be valid from 2021-01-18, spring semester of 2021.

Field of education: Science 100%

Department: Department of Mathematical Sciences

Position in the educational system

The course is an independent basic course in mathematics and gives an introduction to higher education in mathematics and natural sciences. It can only be included in a university degree if there is no course in the main field of studies mathematics. Nor can it be included in a university degree together with a similar introductory course in mathematics.

Main field of studies

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Specialization

G1N, First cycle, has only upper-secondary level entry requirements

Entry requirements

General entrance requirements for university studies and the Swedish upper secondary course Mathematics D or Mathematics 4 or equivalent.

Learning outcomes

After having completed Part 1, the student will be able to

- confidently carry out numerical calculation with fractions, powers, roots and logarithms

- make conversions of algebraic expressions and be aware of the importance of the equals sign in this
- solve root equations and quadratic equations
- show familiarity with coordinate systems in two dimensions and analytical description of curves therein
- show familiarity with trigonometric functions and solve simple trigonometric equations
- carry out long division and understand and be able to use the factor theorem in calculations.

After completing Part 2, the student will be able to

- confidently carry out calculations with complex numbers
- solve equations with elementary functions, in particular make the right choices of appropriate conversions of trigonometric expressions in connection with this
- solve inequalities with rational expressions
- show sufficient familiarity with the concept of limits to be able to use them to find asymptotes for rational expressions
- show familiarity with the meaning of derivative and definite integral
- show knowledge of the derivative and primitive function of elementary functions and carry out differentiation and simple forms of integration in practical calculation.

Course content

The course is divided into two modules, designated Part 1 and Part 2, which are 4.5 and 3 hec respectively. Part 1 is divided into two components, Part 1A and part 1B, which are 1.5 hec and 3 hec respectively. These components are reported separately in Ladok.

Sub-courses

1. **Part 1** (*Del 1*), 4.5 credits

Grading scale: Pass (G) and Fail (U)

Part 1 contains: Numerical calculation with fractions, powers, roots and logarithms. Algebraic conversions. Solution of polynomial equations of degree one and two and higher. Root equations. Linear equation systems. Euclidean and analytical geometry. The trigonometric functions, relationships between these and solution of simple trigonometric equations. The general function concept and basic functions such as polynomial functions, rational functions, absolute values, the exponential and the logarithm functions.

2. **Part 2** (*Del 2*), 3 credits

Grading scale: Pass (G) and Fail (U)

Part 2 contains: Complex numbers. Solution of equations with elementary functions. Inequalities. Limits with application to asymptotes to rational functions.

Derivatives and integrals.

Form of teaching

The course is Web-based and students have during the course access to a support center which answers questions via Internet and telephone.

Language of instruction: Swedish

Assessment

The course is assessed continuously in the form of Web-based tests. Only those who pass the first test are registered in the course. A final written assignment may be included in the examination. Electronic tests may be done in unlimited extent and at any time that the Web-based material is available.

Grades

The grading scale comprises: Pass (G) and Fail (U).

For the grade Pass on the whole course, Pass on each module is required.

Course evaluation

Course evaluation is carried out through a questionnaire via Internet.

Additional information

The course is established due to the Government's decision that all high school students should be offered a bridging course between studies of mathematics on high school and university level. The course is mainly given during the summer and is called in less formal contexts, "Sommarmatte" (Summer Math).

The course syllabus of MMG020 was originally established to apply from 01/04/2007. It has been revised 07/06/2007, 15/03/2009 and 01/01/2015. Versions current up to 31/12/2014 are not in the Gubas syllabus database.