# Department of Mathematics (incl. Math. Statistics)

# Stockholm University

# Syllabus

for course at first level

**Introductory Course in Mathematics**
**Förberedande kurs i matematik**

**7.5 Higher Education Credits**
**7.5 ECTS credits**

| | |
|---|---|
| **Course code:** | MM1003 |
| **Valid from:** | Summer 2013 |
| **Date of approval:** | 2007-06-07 |
| **Changed:** | 2013-03-04 |
| **Department** | Department of Mathematics (incl. Math. Statistics) |

| | |
|---|---|
| **Main field:** | Mathematics/Applied Mathematics |
| **Specialisation:** | G1N - First cycle, has only upper-secondary level entry requirements |

## Decision

This syllabus has been approved by the Board of the Faculty of Science at Stockholm University on 27 September 2006, revised on 7 June 2007, 17 May 2010, and 4 March 2013.

## Prerequisites and special admittance requirements

Swedish upper secondary school course Mathematics C, or equivalent.

## Course structure

| Examination code | Name | Higher Education Credits |
|---|---|---|
| M101 | Numbers | 1.2 |
| M102 | Algebra, combinatorics and logic | 1.2 |
| M103 | Functions and sets | 1.2 |
| M104 | Problem solving | 3.9 |

## Course content

a. The course treats the extentions of the basic field of numbers from the positive integers to the complex numbers. The binomial theorem, prime numbers and factorization. Logic. Functions, inequalities, absolute value. Algebraic and graphic representation of point sets. Limits and the importance of the derivative in optimization problems. Trigonometric functions and equations, polar representation of complex numbers. Arithmetic operations on polynomials, the factor theorem. The concept of the integral as an infinite sum.

b. The course includes the following elements:
1. Numbers 1.2 credits (M101)
2. Algebra, Combinatorics, and Logic 1.2 credits (M102)
3. Functions and Sets 1.2 credits (M103)
4. Problem Solving 3.9 credits (M104)

## Learning outcomes

It is expected that the student after taking the course will be able to:
• account for the meaning of the arithmetical operations in different number domains and know in different ways how to perform these
• change between graphical and algebraic representations of point sets
• handle polynomials algebraically and use this in equation solving
• use the derivative in optimization problems

• account for the general definitions of the trigonometric functions and their use in the polar representation of complex numbers
• argue mathematically and be able to evaluate mathematical reasoning.

**Education**

The education consists of distance studies.

**Forms of examination**

a. Examination for the course is conducted in the following manner: Assessment of knowledge is by written assignments and a written examination.

b. Grading is carried out according to a 7-point scale related to learning objectives:
A = Excellent
B = Very Good
C = Good
D = Satisfactory
E = Sufficient
Fx = Fail
F = Fail
Grading of parts 1-3 is according to a 2-point scale: pass (P) or fail (F).

c. Grading criteria will be distributed at the beginning of the course.

d. In order to pass the course, a minimum of a grade E is required as well grades P (pass) on parts 1-3.

e. Students who fail to pass the exam have the right to sit additional exams as long as the course is offered. The number of attempts is not limited. This also includes the other compulsory parts. Students who have passed an examination may not retake exams for higher grades. Students who have failed the examination twice have the right to request the appointment of another examiner to determine the grade. Such requests should be made to the Departmental Board. At least two examination sessions are offered during years in which the course is given. Intervening years, at least one session is offered.
f. No opportunity to supplement the grade Fx up to a passing grade is given in this course.

**Interim**

Students may request the examination to be carried out according this syllabus even after it has ceased to apply up to three times over the two year period following the last instance of the course. This also applies to any revision of the syllabus. Such requests should be made to the Departmental Board.

**Limitations**

The course can not be included in a degree alongside Mathematics I (MM2001), Introductory Course in Mathematics (MA1130), or equivalent.

**Misc**

The course is given as an individual course.

**Required reading**

Course literature is decided by the departmental board and is described in an appendix to the syllabus.