



# SF2717 Mathematics, Advanced Course 6.0 credits

Matematik, fördjupning

This is a translation of the Swedish, legally binding, course syllabus.

## Establishment

Course syllabus for SF2717 valid from Autumn 2019

## Grading scale

A, B, C, D, E, FX, F

## Education cycle

Second cycle

## Main field of study

Mathematics

## Specific prerequisites

Completed basic course SF1626 Calculus in Several Variable and SF1662 Discrete Mathematics.

## Language of instruction

The language of instruction is specified in the course offering information in the course catalogue.

## Intended learning outcomes

After the course the student should be able to

- explain basic concepts and theorems within the parts of algebra and analysis described by the content of the course,
- apply concepts, theorems and methods to solve and present the solutions of problems within the parts of algebra and analysis described by the content of the course,
- Explain and summarize results from the current mathematics literature.

## Course contents

Mathematics as a logical system. The number system, especially Peano's axioms for the natural numbers and Dedekind's construction of the real numbers. Cardinality. Basic set theory. Groups, rings, fields, linear spaces. Metric spaces, convergence, continuity, compactness, connections. Contractions and fixed point theorems with applications. Analysis, in particular in  $\mathbb{R}$  and  $\mathbb{R}^n$ : The definition of the elementary functions and the derivation of their properties. Advanced study of differential and integral calculus. The concept of area and volume.

An independent work within an area from the current mathematical literature.

## Course literature

Announced no later than 4 weeks before the start of the course on the course web page.

## Examination

- TEN1 - Examination, 6.0 credits, grading scale: A, B, C, D, E, FX, F

Based on recommendation from KTH's coordinator for disabilities, the examiner will decide how to adapt an examination for students with documented disability.

The examiner may apply another examination format when re-examining individual students.

If the course is discontinued, students may request to be examined during the following two academic years.

An exam which may be replaced, in part or fully, by examination determined in consultation between the teacher and the students.

The examiner decides, in consultation with KTH's Coordinator of students with disabilities (Funka), about any customized examination for students with documented, lasting disability. The examiner may allow another form of examination for re-examination of individual students.

## Ethical approach

- All members of a group are responsible for the group's work.
- In any assessment, every student shall honestly disclose any help received and sources used.
- In an oral assessment, every student shall be able to present and answer questions about the entire assignment and solution.