

Faculty of Science

MATB15, Mathematics: Analysis in Several Variables, 15 credits Matematik: Flervariabelanalys, 15 högskolepoäng First Cycle / Grundnivå

Details of approval

The syllabus was approved by Study programmes board, Faculty of Science on 2007-11-19 and was last revised on 2011-04-27. The revised syllabus applies from 2011-04-28, autumn semester 2011.

General Information

The course is an elective course for first-cycle studies for a Bachelor of Science.

Language of instruction: English and Swedish The course will be given in English on request.

Main field of studies	Depth of study relative to the degree requirements
Mathematics	G1F, First cycle, has less than 60 credits in first-cycle course/s as entry requirements

Learning outcomes

The aim of the course is that students on completion of the course should have acquired the following knowledge and skills:

Knowledge and understanding

On completion of the course, the student should:

- be able to use and account for the theory for and the applications of differential and integral calculus for functions of several variables
- have familiarity with the mathematical concepts and methods that are taken up in the contents of the course

Skills and abilities

On completion of the course, the student should:

- have developed the ability to interpret relevant information and to independently identify, formulate and solve problems that concern real valued functions of several variables
- have developed good skills and abilities to handle problems within differential and integral calculus for functions of several variables
- have developed his or her ability to identify the logical structure in mathematical arguments and to carry out mathematical proofs
- have developed his or her ability to communicate mathematics in speech and writing

Judgement and approach

On completion of the course, the student should:

- be able to evaluate and use formal treatment of mathematics
- have acquired basic knowledge for continued studies in mathematics

Course content

- Continuous functions of several variables, optimisation
- Differentiable functions, gradients and directional derivatives, extreme values
- Substitution of variables, inverse function theorem, implicit functions
- Multiple integrals, generalised integrals, surface integrals
- Green's formula, Gauss's divergence theorem, Stoke's theorem

Course design

The teaching consists of lectures and problem solving classes.

Assessment

The examination consists of a written exam followed by an oral exam. The oral exam may only be taken by those students who pass on the written exam.

Students who fail the regular exam are offered a re-examination shortly afterwards.

Subcourses that are part of this course can be found in an appendix at the end of this document.

Grades

Marking scale: Fail, Pass, Pass with distinction. To pass the entire course, passed written examination and passed oral test are required.

The final grade is based on the result on the written exam.

Entry requirements

For admission to the course, general entry requirements and knowledge equivalent to MATA14 Analysis 1, 15 credits and MATA15 Algebra 1, 15 credits, are required.

Further information

The course may not be included in a higher education qualification together with MAT245 Multivariable analysis 10 p.

Subcourses in MATB15, Mathematics: Analysis in Several Variables

Applies from H07

0701 Multivariable Analysis, 15,0 hp Grading scale: Fail, Pass, Pass with distinction