Mathematical Analysis

Single subject and programme course

15 credits

Matematisk analys

764G07

Valid from: 2010 Autumn semester

Determined by
The Quality Board at the Faculty of Arts and Sciences

Date determined
2010-06-17

Main field of study
No main field of study

Course level
First cycle

Advancement level
G1X

Course offered for
- Bachelor´s Programme in Statistics and Data Analysis

Entry requirements
General entry requirements and MaC and ShA (specific entry requirements 5).

Intended learning outcomes
On completion of the course, the student should be able to
- read and interpret mathematical text
- use definitions of central concepts and central approaches
- use arithmetical rules for limits, derivatives, primitive functions and integrals for functions in one variable
- analyse functions in one variable and draw conclusions about the properties of functions
- use standard techniques to determine primitive functions and definite integrals
- draw expressions for, and calculate, geometric quantities
- solve the differential equations of the 1st order
- use Taylor expansions to approximate functions with polynomial
- perform convergence studies of generalised integrals (one variable calculus)
- use certain concepts of multivariable analysis.

Course content

One variable calculus: Algebraic operations. Equations. Differences. Absolute value. Actual and complex numbers. Binomial theorem. Functions of an actual variable. Polynomial. Exponential and logarithm functions. Trigonometric functions. Limit. Derivative and continuity. Derivation rules. Properties of continuous functions. Extreme value. Largest and smallest value. Function study. Primitive function. Integration with geometric applications such as area, arc length, area of rotation, volume of rotation. Generalised integrals. Taylor's formula. Maclaurin expansion of elementary functions with application to limit calculations. Differential equations of the first order. Control of results and partial results
Multivariable analysis: Graphical interpretation of functions in two variables. Partial derivatives. Stationary points. Double integrals. Variable exchanges

Teaching and working methods

The teaching takes the form of lectures and teaching sessions. The students should also study independently.

Examination

The course is examined via two written examinations. Detailed information can be found in the study guide.

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