Linnæus University

Course syllabus

Faculty Board of Science and Engineering

School of Computer Science, Physics and Mathematics

1MA104 Analys II, 7,5 högskolepoäng
1MA104 Calculus II, 7.5 credits

Main field of study
Mathematics

Subject Group
Mathematics

Level of classification
First Level

Progression
G1F

Date of Ratification
Approved 2009-08-11
Revised 2012-08-17 by School of Computer Science, Physics and Mathematics.
Prerequisites are revised.
The course syllabus is valid from spring semester 2013

Prerequisites
1MA102 Calculus I 7.5 credits or equivalent.

Objectives

The student should be able to:

- perform computations with limits, derivatives, integrals and improper integrals.
- Use more complicated substitutions and Euler's formulas to calculate certain integrals.
- understand convergence and divergence and be able to use standard criteria to determine such properties.
- perform calculations of limits and integrals by Taylors formula.
- describe definitions and derive relations between central concepts of the course and apply these relations to solve problems.
- derive relations within the areas of limits, sums and integrals.
- interpret, communicate and argue using mathematical notions.

Content

- Integrals: Integration of trigonometric and irrational functions;
- Improper integrals: definition and convergence. Comparison test;
- Sequences: definition, properties, supremum and infimum, limit, rules for calculating limits. Convergence of monotonic sequences;
- Continuous functions: the theorem of intermediate values, Weierstrass theorem about maximum and minimum values;
- Series: convergence, properties of convergent series;
- Positive series: comparison tests, quotient and root tests, integral test. Alternating series, conditional convergence, absolute convergence;
- Power series, radius of convergence, interval of convergence;
- Maclaurin and Taylor formulas with errors in Big-O form and in Lagranges form. Taylors formula for the elementary functions, calculations of limits and integrals by Taylors formula.

Type of Instruction
Lectures and seminars. Compulsory assignments may be given during the course.

Examination
The course is assessed with the grades Fail (U), Pass (G) or Pass with Distinction (VG).

On request, students may have their credits translated to ECTS-marks. Such a request must be sent to the examiner before the grading process starts.

The student's knowledge is assessed in the form of written examinations which involve both computation and theory questions. Furthermore, continuous assessment in written or oral form can be used during the course. The principal assessment method for the course is determined at the beginning of the course.

Course Evaluation
A course evaluation will be carried out at the end of the course in accordance with the guidelines of the University. The result of the course evaluation will be filed at the department.

Required Reading and Additional Study Material

Robert Adams. *Calculus – A Complete course*, Addison-Wesley Educational Publishers, 6th edition, 2005 or later.
300 (1020) pages