Linnæus University

Jnr: 2019/965-3.1.2.2

Course syllabus

Faculty of Technology
Department of Mathematics

1MA404 Analys II, 7,5 högskolepoäng
Calculus II, 7.5 credits

Main field of study
Mathematics

Subject Group
Mathematics

Level of classification
First Level

Progression
G1F

Date of Ratification
Approved 2015-05-22
Revised 2019-03-13 by Faculty of Technology. Assessment methods are revised.
The course syllabus is valid from spring semester 2020

Prerequisites
1MA102 Calculus I 7.5 credits or equivalent.

Objectives

After completing the course, the student should be able to

- solve problems, perform calculations, and conduct lines of reasoning within the part of mathematics that is covered by the course, and to communicate these solutions, calculations, and reasonings in writing
- describe definitions, and formulate and prove theorems that are central to the course.

Content

The main goal with the course is to give an introduction to integration and series in one variable.

- Integrals: Definition of integral, the Mean-Value Theorem for Integrals, the Fundamental Theorem of Calculus, integration by parts, substitutions, applications to differential equations.
- Improper integrals: definition and convergence. Comparison test.
- Sequences: definition, properties, supremum and infimum. Convergence of monotonic sequences;
- 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 approximation of integrals by Taylors formula.
- Mathematical writing and numercical compution of integrals and series using mathematical software.

Type of Instruction

Lectures and seminars.

Examination

The course is assessed with the grades A, B, C, D, E, Fx or F.
The grade A constitutes the highest grade on the scale and the remaining grades follow in descending order where the grade E is the lowest grade on the scale that will result in a pass. The grade F means that the student's performance is assessed as fail (i.e. received the grade F).

The student's knowledge in problem solving and theory is assessed in the form of a written exam. Mathematical writing and numerical methods is assessed in the form of assignments.
The final grade of the course is determined by the grade on the problem solving part.

Course Evaluation

During the course or in close connection to the course, a course evaluation is to be carried out. The result and analysis of the course evaluation are to be communicated to the students who have taken the course and to the students who are to participate in the course the next time it is offered. The course evaluation is carried out anonymously. The compiled report will be filed at the Faculty.

Credit Overlap

The course cannot be included in a degree along with the following courses of which the content fully, or partly, corresponds to the content of this course: 1MA104 Calculus II, 7.5 credits.

Other

Grade criteria for the A–F scale are communicated to the student through a special document. The student is to be informed about the grade criteria for the course by the start of the course at the latest.

Required Reading and Additional Study Material

Robert Adams. *Calculus – A Complete course*, Addison-Wesley Educational Publishers, latest edition. Expected reading 240/1020 pages.

Franco Vivaldi, Mathematical Writing, Springer, 2014. Expected reading 50/200 pages.