IX1302 Mathematics II 7.5 credits

Matematik II

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

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

Establishment

Course syllabus for IX1302 valid from Autumn 2008

Grading scale

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

Education cycle

First cycle

Main field of study

Mathematics,Technology

Specific prerequisites

Knowledge corresponding Mathematics I, 6B2970 (7.5 hp)

Language of instruction

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

Intended learning outcomes

This course shall make the student confident with fundamental functions and main concepts in calculus and probability theory.

After course completion the student should be able to

- formulate a mathematical model from a given text problem

in single-variable calculus and elementary probability theory

translate the mathematical model into a mathematical programming

language (e.g. Mathematica or Maple)

- analyze and review a solution and make conclusions (synthesis)

DETAILED OBJECTIVES

After course completion the student should be able to

- make calculations with complex numbers in Cartesian and polar form

- calculate modulus, argument and conjugate

- cite and explain de Moivre?s theorem

- cite and explain definitions of properties, such as

local extreme, limit, continuity, derivative,

indefinite and definite integral

- cite and explain important theorems, such as

the intermediate-value theorem, the max-min theorem,

the fundamental theorem of calculus, the mean-value theorem

- use rules for calculating limits, derivatives,

indefinite and definite integrals

- examine a function, i.e. use derivatives limits and

properties of elementary functions and make conclusions

of the properties of the function

- give expressions for area of a plane region, arc length,

volume for solids of revolution

- compute elementary antiderivatives

- make comparisons between sums and integrals

- manage differential equations (1st order linear, separable and higher

order with constant coefficients)

- use Taylor?s formula to approximate functions

- make controls ofresults and verify the correctness or relevance

- cite and explain the probability concept

(conditional probability, independence)

- cite and explain stochastic variable (discrete and continuous)

- use elementary distributions,

e.g. Binomial, Poisson, exponential and normal distribution

- compute probabilities, and measures (location and spreading)

- cite and explain the Central Limit theorem

Course contents

Continuity

Limits

The function concept

Elementary functions

Complex numbers

Polynomials

Derivatives

Integrals

Differential equations

Taylor?s formula

Series

Convergence

PROBABILITY THEORY

Stochastic variables (discrete and continuous)

Measures (position, spreading)

Important distributions

Central Limit theorem

Course literature

Calculus, Adams, Robert A

Upplaga: 6th Förlag: Addison Wesley Longman År: 2006

ISBN: 0-321-27000-2

Examination

- INL1 - Assignments, 1.5 credits, grading scale: P, F
- 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.

Other requirements for final grade

Written exam (TEN1; 6 hp, grade U,3-5)
Laboratory assignments (LAB1; 1.5 hp, grade G/U)
Course grade = grade of TEN1

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.