



Course syllabus

Faculty of Technology

Department of Mathematics

0MA112 Matematik Bas 4, 7,5 förutbildningspoäng

Mathematics, Preparatory Course 4, 7.5 pre-education credits

Subject Group

Mathematics

Level of classification

Pre-university level

Progression

FXX

Date of Ratification

Approved by Faculty of Technology 2014-08-26

The course syllabus is valid from spring semester 2015

Prerequisites

Matematik 3c or Matematik C.

Objectives

The student should be able to:

- master the complex number calculations written in different forms
- use algebraic and graphical methods to solve polynomial equations with complex roots
- make use of trigonometric expressions and proof and use of trigonometric formulas
- handle with algebraic and graphical methods to solve trigonometric equations
- describe the properties of trigonometric functions, logarithmic functions, composite functions, absolute value as a function
- master sketching of graphs and their asymptotes
- derive and use the rules of differentiation of trigonometric, logarithmic, exponential and composite functions, and product and quotient of functions
- describe the algebraic and graphical methods for the determination of integrals with and without digital tools
- explain the concept of differential equation and its properties in simple applications
- apply strategies for mathematical problem solving including the use of digital tools

Content

- methods of calculations with complex numbers written in different forms, complex plane, representation of complex numbers, conjugate and absolute value of a complex number
- use and proof of de Moivre's formula
- algebraic and graphical methods to solve simple polynomial equations with complex roots and real polynomial equations of higher degree, even using the factor theorem
- management of trigonometric expressions and evidence and use of trigonometric formulas
- algebraic and graphical methods to solve trigonometric equations
- characteristics of trigonometric functions, logarithmic functions, and composite functions and the absolute value as a function
- sketching of graphs and their asymptotes
- derivation and use of differentiation rules for trigonometric, logarithmic, exponential and composite functions, product and quotient of functions
- algebraic and graphical methods for the determination of integrals with or without digital tools
- the concept of a differential equation and its properties in simple applications
- strategies for mathematical problem solving including the use of digital tools
- mathematical problems of importance to society, and applications in other subjects.

Type of Instruction

Lectures and exercises.

Examination

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

Assessment of the students's performance is made through written and/or oral examination. Continuous assessment by written and/or oral presentations may also occur. The assessment method is decided at the start of the course.

Course Evaluation

A course evaluation will be carried out and compiled after the course is completed. The compilation will be presented to the current board as well as to the students and filed by the coordinating department.

Other

The course is equivalent high school course Matematik 4.

Required Reading and Additional Study Material

Literature

Alfredsson L, Bråthing K, Erixon P, Heikne H, *Matematik 5000 Kurs 4 Blå lärobok*, Natur och kultur, latest edition.