Syllabus for

Academic year 2009/2010 >

TMV176 - Introductary course in mathematics

Syllabus is not yet adopted
Owner: TKDES
9,0 Credits
Grading: TH - Five, Four, Three, Not passed
Education cycle: First-cycle
Major subject: Mathematics
Department: 11 - MATHEMATICAL SCIENCES

Teaching language: Swedish

Credit distribution

Course module				Sp1	Sp2	Sp3	Sp4	Summer course	Examination dates		
0108	Examination	7,5 c	Grading: TH	7,5 c					Sat 24/10-2009 am M,	Sat 16/01-2010 am V,	Wed 25/08-2010 am V
0208	Laboratory	1,5 c	Grading: UG	1,5 c							

In programs
TKDES INDUSTRIAL DESIGN ENGINEERING, Year 1 (compulsory)

Examiner:
Professor Stig Larsson

Replaces
TMV175 Introductary course in mathematics

Course evaluation:
https://document.chalmers.se/doc/1167020353

Go to course homepage

Eligibility:
For single subject courses within Chalmers programmes the same eligibility requirements apply, as to the programme(s) that the course is part of.

Aim
The purpose of the course is to strengthen, deepen and develop the knowledge in secondary school mathematics and to thereby give a solid ground for further studies in mathematics. Further the course will give an introduction to programming in MATLAB.

Learning outcomes *(after completion of the course the student should be able to)*
fluently handle algebraic calculations and the elementary functions, both in problem solving and its theory.
- draw graphs and solve equations, both by hand and using MATLAB.
- solve systems of linear equations by hand and using MATLAB and master vector algebra in two and three dimensions.

Content
Algebraic calculations and the number systems. Fractions, rules for powers and power expansions. Basic trigonometry. Analytic geometry.

Introduction to calculus: Real functions, graphs, limits, derivatives and the use of these concepts in basic modeling.

Deductive reasoning. Elementary set theory and fundamentals of logic. The general concept of a function.

The elementary functions: Polynomials, rational and power functions.
Inverse functions, exponentials, logarithms and inverse trigonometric functions.
The derivative of the elementary functions.

Applications of differentiation: Extreme values, numerical methods for solving equations. Newton-Raphsons method and other iterations.
Sequences and limits. Mathematical induction.

Systems of linear equations and matrices. Vectors in two and three dimensions.
Dot product, cross product, area and volume.

The complex plane, rectangular and polar form. The complex exponential function.

MATLAB.

Organisation

Instruction is given in lectures and classes. More detailed information will be given on the course web page before start of the course.

Literature

Literature will be announced on the course web page before start of the course.

Examination

More detailed information of the examination will be given on the course web page before start of the course.
Examples of assessments are:
-selected exercises are to be presented to the teacher orally or in writing during the course,
-other documentation of how the student's knowledge develops,
-project work, individually or in group,
-written or oral exam during and/or at the end of the course.
-problems/exercises are to be solved with a computer and presented in writing and/or at the computer.