UNIVERSITY OF BORÅS

Calculus
Calculus/Matematisk analys
7.5 credits
7.5 högskolepoäng

Ladok Code: TT0311
Version: 1.0
Established by: Board of the department 2009-04-17
Valid from: Autumn 2009

Education Cycle: First cycle
Main Field of Study (Progressive Specialisation):
Disciplinary Domain: Natural sciences
Prerequisites: Admitted to Industrial Engineering - Business Engineering.
Subject Area:
Grading Scale: ECTS-credits

Content

- Functions, change and measure
- Elements of functions of several variables
- Real and complex numbers
- Elementary single variable functions and their problems
- Integration
- Differention
- Piecewise continuity and limits
- Sequencies, series and recursions
- Differential equations
- Approximation
- Applications in logistics and economics

Learning Outcomes
This course develops the techniques and theory of elementary calculus needed to model and work with general nonlinear systems in science and engineering. Selected applications to economics and logistics are included. Single variable analysis is taught in a context of many variable functional dependencies. Computer based tools are used to facilitate realistic computations. The course introduces the student to a general systems and processes thinking
After passing the course the student should be able to
1. Recognize systems where mathematical modelling using tools of analysis can be used
2. Perform integration and differentiation
3. Set up and solve differential equations
4. Model and solve nonlinear systems using tools of analysis
5. Draw graphs of functions
6. Apply the general theory in relevant contexts and solve the ensuing problems

Forms of Teaching
Lectures, exercise classes, computer laboratory work.

The language of instruction is English.

Forms of Examination
The course will be examined through the following examination elements:

Learning outcomes:
Credits: 3.5
Gradingscale: ECTS-credits

Written examination
Learning outcomes:
Credits: 4
Gradingscale: ECTS-credits

Student rights and obligations at examination are in accordance with guidelines and rules for the University of Borås.

Literature and Other Teaching Materials

Student Influence and Evaluation

The head of department and the course coordinator are responsible for a continuous and systematic collection of students´views. The evaluation report is presented for the students and will be the basis for the future design of the course.

Miscellaneous

Required reading and teaching tools

To be specified.