SF1676 Differential Equations with Applications 7.5 credits

Differentialekvationer med tillämpningar

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

Establishment

Course syllabus for SF1676 valid from Spring 2020

Grading scale

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

Education cycle

First cycle

Main field of study

Technology

Specific prerequisites

Completed basic course SF1626 Calculus in Several Variable

Language of instruction

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

Intended learning outcomes

After passing the course, the students should be able to

- use concepts, theorems and methods to solve, and present the solution to, problems within theparts of the theory of differential equations that are described by the course content;
- apply and combine in the form of a group project the methods of differential equations to apractical problem connected to the construction area and the built environment;
- read and comprehend mathematical text.

Course contents

- First order ordinary differential equations: Fundamental theory and concepts, separable and linear equations, modeling.
- Linear ordinary differential equations of higher order and systems of linear ordinary differential equations: Fundamental theory, finding solutions in specific cases, in particular the case of constant coefficients, discussion of properties of solutions.
- Autonomous systems: Fundamental concepts, stationary solutions and their stability, applications to dynamical systems and scientific modeling.
- Integral transforms: Laplace transform and Fourier series, and their application to differential equations.
- Introduction to partial differential equations: Solution of classical boundary value problems.
- Group project: Application to concrete problems connected to the construction area and the built environment.

Course literature

Announced no later than 4 weeks before the start of the course on the course web page.

Examination

- PRO1 - Project, 1.5 credits, grading scale: P, F
- TEN1 - Exam, 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.

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

The examiner decides, in consultation with KTHs Coordinator of students with disabilities (Funka), about any customized examination for students with documented, lasting disability.

Other requirements for final grade

Written exam, possibly with continuous examination. A project with presentation.

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.