# SF1683 Differential Equations and Transforms 9.0 credits

## Differentialekvationer och transformmetoder

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 SF1683 valid from Autumn 2019

## 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 or SF1674 Multivariable Calculus.

## Language of instruction

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

## Intended learning outcomes

After the course the student should be able to

- use theorems and methods to solve solutions to problems within the parts described by the course content,
- demonstrate av basic understanding of the mathematical concepts within the course content,
- read and comprehend mathematical text and show the ability to explain mathematical reasoning.

For higher grades, the student in addition should be able to:

- demonstrate a deeper understanding of the course content by describing proofs,
- be able to solve more complex problems within the problem areas of the course descibed by the course content.

## Course contents

First order differential equations. Second order linear equations. The Laplace transform. Systems of differential equations. Qualitative methods for non-linear differential equations. Long term behaviour. Stability of critical points. Existence and uniqueness theorems. Fourier series, inner product rooms, orthogonal systems of functions. Sturm-Liouville problems. The Fourier transform. Distributions. Partial differential equations. Separation of variables. Applications to ordinary and partial differential equations. Introduction to analytical functions of one complex variable. Basic theory of power series. Elementary analytical functions.

## Course literature

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

## Examination

- TEN1 - Exam, 5.0 credits, grading scale: A, B, C, D, E, FX, F
- TEN2 - Exam, 4.0 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.

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

ity. The examiner may allow another form of examination for re-examination of individual students.

## 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.