SF1632 Complementary Course in Differential Equations and Transforms 3.0 credits

Kompletteringskurs i differentialekvationer och transformer

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 SF1632 valid from Spring 2015

Grading scale

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

Education cycle

First cycle

Main field of study

Mathematics,Technology

Specific prerequisites

One of the courses

- SF1633 Differential Equations I
- SF1634 Differential Equations II

- SF1523 Analytical and Numerical Methods for Differential Equations
- SF1676 Differential Equations with Applications

Language of instruction

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

Intended learning outcomes

After the course, students should be able to

- solve second order linear differential equations using power series
- calculate Fourier series and their sums
- use summation kernels
- solve approximation problems with orthogonal projections in inner product spaces
- solve problems using systems of orthogonal polynomials
- solve partial differential equations using separation of variables
- solve the Dirichlet problem for the unit disc
- solve Sturm-Liouville problems
- calculate Fourier transforms and perform calculations with Fourier transforms and convolutions (with applications to partial differential equations)
- use the Z-transform
- perform calculations with distributions and their derivatives and Fourier transforms

Course contents

Series solutions to second order linear ordinary differential equations.

Fourier series, orthogonal functions. Sturm-Liouville problem.

Fourier transform.

Discrete transforms. Partial differential equations. Separation of variables.

Applications of ordinary and partial differential equations.

Distributions.

Course literature

Boyce-Diprima:Elementary Differential Equations and Boundary Value Problems, 8:th ed.

Anders Vretblad: FOURIERANALYSIS and Its Applications.

Examination

 • TEN1 - Examination, 3.0 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.

Other requirements for final grade

Written exam.

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.