SF2705 Fourier Analysis 7.5 credits

Fourieranalys

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 SF2705 valid from Spring 2018

Grading scale

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

Education cycle

Second cycle

Main field of study

Mathematics

Specific prerequisites

Courses corresponding to SF1677 Analysis basis.

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

- formulate central definitions and theorems of Fourier analysis;
- apply and generalize theorems and methods within Fourier analysis;
- describe, analyze and formulate basic proofs within Fourier analysis.

Course contents

Fourier series and integrals in one variable: Pointwise convergence, convergence in L2, summation of Fourier series and integrals. Theorems of Parseval and Plancherel.

Fourier series and integrals in several variable: Fourier analysis in higher dimensions and on discrete Abelian groups.

Fourier analysis of analytic functions: Hardy functions on the unit disk, Paley-Wiener Theorem, Hardy functions and filters.

Applications: Selection of the following. Heat equation, wave equation, isoperimetric inequality, Laplace equation on the unit disk and half-plane, Szego's Theorem.

Course literature

Dym, McKean "Fourier Series and Integrals". Academic Press, 1985.

Examination

- TEN1 - Examination, 7.5 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. For obtaining higher grades, additionally an oral exam is required.

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.