FSF3631 Classical Analysis and its applications in Mathematics 7.5 credits

Klassisk analys och dess tillämpning i matematik

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 FSF3631 valid from Spring 2019

Grading scale

G

Education cycle

Third cycle

Specific prerequisites

Attendance are required to have god knowledge in Analysis and Algebra at master level, and some basic probability theory.

Language of instruction

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

Intended learning outcomes

After completing the course:

1. Students should have general knowledge of several classical topics in Analysis and their applications in other areas of mathematics.
2. Students are supposed to have in-depth knowledge of at least one area outside their own research, and its connection to other areas.
3. Students should be familiar with technical tools from the areas represented at the course.
4. Students should have a heuristic overview of the topics given at the course.

Course contents

The course will include (some or all of) the following areas, but may well be expanded, depending on participants and examiner.

Functional Analysis, Geometric Measure Theory, Ergodic Theory, Probabilistic Techniques, Harmonic Analysis on Groups, Sobolev Spaces.

Disposition

Lectures and presentation, self-study, homework.

Course literature

Robert Zimmer: Functional analysis

Pertti Mattila: Geometry of sets and measures in Euclidean spaces.

Peter Walters: An introduction to Ergodic theory

Richard F. Bass: Probabilistic Techniques in Analysis

Katznelson: An introduction to Harmonic Analysis.

Folland: A course in abstract harmonic analysis

Bressan: Lecture Notes on Sobolev Spaces

R. Adams, J.F. Fournier: Sobolev Spaces

Examination

- PRO1 - Project work, 7.5 credits, grading scale: P, 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.

Examination will consist of one topic presentation by students, as well as homework.

Other requirements for final grade

Approved homework assignments, and oral presentation of a project with written report.

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.