



# FSK3759 Superconductivity and applications 6.0 credits

## Supraledning och tillämpningar

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 FSK3759 valid from Autumn 2022

## Grading scale

P, F

## Education cycle

Third cycle

## Additional regulations

The course is given on demand in connection to normal offerings of the master level course SK2905 Superconductivity and other quantum liquids.

## Specific prerequisites

Finished a course in Vector analysis (SI1146)

Finished a course in Quantum Mechanics (SI1155 Theoretical Physics)

The student is expected to have good knowledge in Maxwells equations. In introductory course in Solid State Physics is reommended but not mandatory

## Language of instruction

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

## Intended learning outcomes

The student shall after the course be able to

- apply fundamental theories and concepts in superconductivity
- analyse and evaluate applications of superconductivity
- deepen their knowledge in superconductivity within an area related to their doctoral studies

## Course contents

Physical properties of superconductors, London theory, Vortices in type-II superconductors, vortex dynamics, Beans model, Josephson junctions, quantum interference, SQUID, Ginzburg-Landau theory, BCS theory, applications of superconductivity

## Examination

- FÖR1 - Deepening task, 1.5 credits, grading scale: P, F
- IMU1 - Hand-in-problems with final oral exam, 4.5 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.

FÖR1 is an individual task with superconductivity. The subject and examination form (oral or written) is decided in agreement between student and examiner

## Other requirements for final grade

A pass grade on all parts of the examination in the course.

## 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.