SI2600 Condensed Matter Theory 7.5 credits

Kondenserade materiens teori

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 SI2600 valid from Autumn 2007

Grading scale

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

Education cycle

Second cycle

Main field of study

Physics

Language of instruction

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

Intended learning outcomes

After the course you should be able to:

- Formulate the many particle problem in second quantized version.
- Use theoretical methods for the many body problem to solve problems covered in the course.
- Give an account of the problems in the area that are treated in the course.

Course contents

Second quantization, the electron gas, boson and fermion systems, electron-phonon interactions, superconductivity, transport theory, mesoscopic physics, quantum Hall effect, Kondo effect and heavy fermions.

Specific prerequisites

Recommended prerequisites: Introductory courses in solid state physics (Kittel level), quantum mechanics and statistical physics are required. Quantum mechanics advanced course SI2380 (5A1385) and Statistical physics SI2510 (5A1390) are recommended.

Course literature

P. L. Taylor and O. Heinonen, A quantum approach to condensed matter physics, Cambridge University Press 2002.

Examination

- INL1 - Assigment, 4.5 credits, grading scale: A, B, C, D, E, FX, F
- 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

Homework problems (INL1; 4,5 university credits) and oral examination (TEN1; 3 university credits).

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.