FSI3210 Many Particle Physics 7.5 credits

Mångpartikelfysik

This is a translation of the Swedish, legally binding, course syllabus.

Establishment

Course syllabus for FSI3210 valid from Spring 2009

Grading scale

G

Education cycle

Third cycle

Specific prerequisites

Good knowledge about all compulsory physics courses and statistical mechanics.

Language of instruction

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

Intended learning outcomes

After completed course, the PhD student should be able to:

• use second quantization formulation of quantum field theory.

- use Green's function technique.
- use Feynman diagrams.
- master the theories for the electron gas, superconductivity (BCS theory), and for super-fluids.
- master the theoretical background for magnetism.

Course contents

Second quantization, BCS theory and superconductivity, Green's functions and field theory, Feynman diagrams, Fermi systems, Linear response and collective modes, Bose systems and RKKY interaction.

Course literature

- **A. Fetter och J. Walecka, Quantum theory of many particle systems, Mc-Graw-Hill 1971.**
- **A. A. Abrikosov, L. P. Gorkov och I. Y. Dzyaloshinskii, Quantum field theoretical methods in statistical physics, Pergamon, 1965.**

Examination

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.

If the course is discontinued, students may request to be examined during the following two academic years.

Other requirements for final grade

Hand in problems.

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.