FSI3260 Quantum transport 7.5 credits

Kvanttransport

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

Establishment

Course syllabus for FSI3260 valid from Autumn 2011

Grading scale

G

Education cycle

Third cycle

Specific prerequisites

Language of instruction

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

Intended learning outcomes

The PhD student shall after the course:

- Get a broad overview of different approaches and physical phenomena in quantum transport and mesoscopic physics

- Get a deep understanding of fundamental concepts and methods
- Gain experience of how the methods used in a number of examples
- Be able to use knowledge to solve practical problems

Course contents

This course treats various approaches to study quantum transport and related phenomena in normal and superconducting nanostructures. Among the topics covered are scattering approach, semiclassical transport, Coulomb blockade, interference, and decoherence.

Course literature

- Y.V. Nazarov and Y.M. Blanter, Quantum transport (Cambridge 2009).
- Y. Imry, Introduction to Mesoscopic Physics (Oxford University Press, 1997)
- T. Dittrich, et al., Quantum transport and dissipation (Wiley-VCH, 1998)

The detailed course literature is planned individually with the examiner.

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

The course is completed by reading suitable literature and doing a set of homework exercises. There is either a written or an oral examination.

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.