



SK2903 Quantum Technology

7.5 credits

Kvantteknologi

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

Establishment

Course syllabus for SK2903 valid from Autumn 2019

Grading scale

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

Education cycle

Second cycle

Main field of study

Engineering Physics

Specific prerequisites

At least 120 credits in engineering and natural sciences and knowledge of English B or equivalent.

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, the student should be able to:

- Explain the role of measurement in quantum physical and how it is related to the quantum state whose time-evolution is described by the Schrödinger Equation.
- Describe the concept of decoherence of the quantum state through its interaction with an environment.
- Describe and apply methods controlling the evolution of a quantum state with external fields.
- Explain quantum entanglement and how it can be used to create physical correlations between observable quantities, extending over very large distances. Demonstrate ability to work with advanced laboratory instruments in a research environment.
- Demonstrate ability to acquire and analyze data from an experiment, as well as present their results in succinct written form and publication-quality graphical form.
- Follow general rules of conduct and specific rules for safety in each laboratory environment.

Course contents

The course will consist of 5 laboratory modules, each carrying 1,5 credits. Each laboratory module will be organized and executed by the different research groups in the department of applied physics. The labs will demonstrate different aspects of Quantum Technology.

Course literature

Lab PM with accompanying literature is distributed to students. Quantum physics course-book used in the course SI2380.

Examination

- LAB1 - Laboratory work, 1.5 credits, grading scale: P, F
- LAB2 - Laboratory work, 1.5 credits, grading scale: P, F
- LAB3 - Laboratory work, 1.5 credits, grading scale: P, F
- LAB4 - Laboratory work, 1.5 credits, grading scale: P, F
- LAB5 - Laboratory work, 1.5 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.

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

The examiner, in consultation with the KTH Disability Coordinator (Funka), decides on any adapted examination for students with documented permanent impairment. The examiner may grant another examination form for reexamination of single students.

Other requirements for final grade

All laboratory work approved (LAB1 - LAB5; 1.5 credits per lab, grade scale P / F).

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.