



- give a detailed account of basic concepts and methods in non-relativistic quantum mechanics
- give an account of important manipulations of operators in Hilbert spaces
- give a detailed account of the mathematical formalism for angular momentum and spin, and apply it to quantum mechanical systems
- give a detailed account of the quantum mechanical description of identical particles and apply it to quantum mechanical systems
- demonstrate command of the methods for time-independent and time-dependent perturbation calculation and for calculation of scattering amplitudes
- give an account of the basic problems in interpreting quantum mechanics
- solve a given selection of the problems related to course literature and content.

Course Content

Instruction is in the form of lectures and seminars at which student's present parts of the course literature. The presentations are submitted in writing.

The course deals with non-relativistic quantum mechanics, the theoretical foundation as well as various applications. The following components are included:

- The basic concepts and ideas

Examination

Assessment is continuous in the form of written and oral seminar presentations and hand-in assignments. There is also a final oral exam.

Course Certificate

Reading List

Advanced Quantum Physics, 2FYS001, 7,5 ECTS credits (Post graduate level)

The syllabus was approved by the Faculty Board of Technology and Science on 9 February 2011 (Reg No: FAK2 2011/32:1), and is valid from the Spring semester of 2011 at Karlstad University.

Sakurai, J J, *Modern Quantum Mechanics*. Last edition, Addison Wesley