Linnæus University

Jnr: 2017/5124-3.1.2.2

Course syllabus

Faculty of Technology
Department of Physics and Electrical Engineering

2FY508 Tillämpad kvantmekanik, 7,5 högskolepoäng
Applied Quantum Mechanics, 7.5 credits

Main field of study
Physics

Subject Group
Physics

Level of classification
First Level

Progression
G2F

Date of Ratification
Approved 2015-05-22
Revised 2017-09-04 by Faculty of Technology. Prerequisites are revised.
The course syllabus is valid from spring semester 2018

Prerequisites
45 credits in Physics including a course in Quantum Mechanics and 30 credits in Mathematics or equivalent.

Objectives
After the course, the student shall

- be able to plan and conduct experiments with advanced equipment
- be able to do statistical analyses and hypothesis testing
- be able to account for experiments and present results
- have insight in the principles of spectroscopic measurements
- have a deeper understanding of quantum mechanics especially with regard to angular momentum

Content
The following experiments may be included in the course:
Nuclear physics: alpha spectroscopy, Rutherford scattering, neutron activation;
Atomic physics: electron spin resonance, optical spectroscopy of one- and two-electron atoms, Zeeman effect, X-ray-spectroscopy, photoelectron spectroscopy
Surface physics: scanning tunneling microscopy
Projects to construct new experiments in modern physics

Type of Instruction
Supervision at course labs and tutoring. The course labs are mandatory.

Examination

The course is assessed with the grades A, B, C, D, E, Fx or F.
The grade A constitutes the highest grade on the scale and the remaining grades follow in descending order where the grade E is the lowest grade on the scale that will result in a pass. The grade F means that the student's performance is assessed as fail (i.e. received the grade F).

The student's experimental is assessed continuously in the lab and on the basis of oral and written reports of the experiments; written examinations of theory may be included.

Course Evaluation

During the course or in close connection to the course, a course evaluation is to be carried out. The result and analysis of the course evaluation are to be communicated to the students who have taken the course and to the students who are to participate in the course the next time it is offered. The course evaluation is carried out anonymously. The compiled report will be filed at the Faculty.

Credit Overlap

The course cannot be included in a degree along with the following courses of which the content fully, or partly, corresponds to the content of this course: 2FY808 Applied Quantum Mechanics, 7.5 credits

Other

Grade criteria for the A–F scale are communicated to the student through a special document. The student is to be informed about the grade criteria for the course by the start of the course at the latest.

Required Reading and Additional Study Material

Required reading

David Prutchi and Shanni Prutchi, "Exploring quantum physics through hands-on projects", Wiley 2012, 288 pages.