



Course syllabus

Faculty of Technology

Department of Physics and Electrical Engineering

4FY52E Fysik, examensarbete (master), 60 högskolepoäng

Physics, Degree Project (Master), 60 credits

Main field of study

Physics

Subject Group

Physics

Level of classification

Second Level

Progression

A2E

Date of Ratification

Approved by Faculty of Technology 2014-10-03

The course syllabus is valid from autumn semester 2015

Prerequisites

Bachelor degree 180 credits in physics. In addition, at least 45 credits at the advanced level.

Objectives

Throughout the Master studies the student has progressively learnt how to plan, design and carry out experimental and theoretical projects, gather relevant information, collect and critically analyze data, develop mathematical models, and analyze the implication and significance of the obtained results. Now these skills are employed to carry out the Master thesis research project, where the student demonstrates the ability to communicate at different levels and in different forms. At the same time, the thesis work is itself an advanced training experience in all the relevant aspects involved in carrying out original research in physics at a professional level.

After taking this course the student is expected:

- to have acquired a deepened knowledge of how the scientific method works in physics research
- to show advanced knowledge and deepened understanding of both classical and modern physics
- to have acquired the ability to identify and formulate, in an independent and critical manner, relevant questions relative to a research area
- to show the ability to use the knowledge and tools acquired during the Master programme in the solution of physics problems
- to show the ability to plan and carry out a research task using appropriate methods and tools within a given time frame

- to be able to evaluate critically the results obtained in the research work
- to have acquired proficiency in communicating, discussing and defending in a logical and clear manner, both verbally and in written form, the conclusions of the research work, together with the concepts and knowledge that constitute the foundations of the research area of the thesis
- to demonstrate the possession of the skills required to participate actively in the research activity of both academic and private institutes, and to qualify for post-graduate studies.

Content

The course includes:

- an introduction of the subject area by the supervisor
- scientific literature search
- an introduction in the chosen theoretical or experimental methods
- supervision in research and thesis writing
- training in oral presentation

One difference between this 60-HP and the ordinary 30-HP degree project is that the student needs a longer preparation period for getting familiar with specialized literature and for acquiring advanced techniques that cannot be obtained via any of the ordinary elective courses offered in the program.

In addition to this extra-time for the project preparation (quantifiable in approximately 15HP or a half-semester study) a 60-HP degree project involves a longer period for carrying out the actual thesis work than a 30-HP or a 45-HP course. This is typically the case of projects done within the research activity of a large research group, for example, conducting experimental work in high-energy physics. Similarly, a longer period of research work, requiring a 60-HP course, might be necessary in projects done in the field of advanced condensed matter physics.

The 60-HP project entails thesis work of higher complexity and extension than a 30-HP or 45-HP thesis.

Type of Instruction

Instruction consists of personal tutoring by an appointed supervisor. The student's participation in research seminars is required.

Students can also register for the “distance” version of the course and follow the course via the Internet. IT support and technical information: Email and web connection.

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).

Assessment is based on the student's Master thesis. An examiner is appointed by the Master programme committee at the beginning of thesis work. He/she will follow the thesis work and assist the committee in the evaluation of the thesis.

The thesis will be submitted to the Master programme committee and defended in a public seminar. The examiner will provide a written report on the thesis and a recommendation to the committee before the defense takes place.

Course Evaluation

A course evaluation will be carried out and compiled after the course is completed. The compilation will be presented to the current board as well as to the students and filed by

the coordinating department.

Credit Overlap

This course cannot be part of a degree in combination with another course in which the content fully or partly correspond to the content of this course: 4FY82E Physics, Degree Project (Master), 60 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

The student, together with the supervisor and examiner, will select relevant literature for the area of the thesis.