



Course syllabus

Faculty of Technology

Department of Physics and Electrical Engineering

GO7694 Examensarbete - Fysik för grundskolans senare år och gymnasiet, 30 högskolepoäng

Degree Project - Physics in Secondary Education, 30 credits

Main field of study

Physics

Subject Group

Educational Sciences/Theoretical Subjects

Level of classification

Second Level

Progression

A1E

Date of Ratification

Approved 2009-08-11

Revised 2018-04-23 by Faculty of Technology. Removal of ECTS-grading scale and course evaluation is changed.

The course syllabus is valid from autumn semester 2018

Prerequisites

60 credits within general education and an orientation/immersion in physics 90 credits or equivalent.

Objectives

The overriding aim of the course is for the students to develop further their ability to carry out developmental and innovative changes within their future professional field both independently and scholastically. The students should also develop their ability to be able to follow educational developments within their professional field and be able to consider theoretically their future profession. Having completed the course the students should:

- be able to identify and formulate questions relevant to physics education in their field of work
- be able to select, argue for and apply relevant scholarly methodology from a chosen problem and theoretical starting point
- be able critically and independently to utilize, systematize and consider both national and international research and development work in physics education
- from a theoretical perspective and in relation to a chosen problem be able to examine critically, analyze and problematise the result and so come to conclusions about teaching and other pedagogical matters
- be able to deal with ethical aspects and considerations in scholarly work
- be able to seek, collect, evaluate and consider information critically
- be able to present and discuss in a scholarly way both in speech and writing

- research and development work
- be able to examine and act as opponent to work of a scholarly nature.

Content

During the course the students conduct research connected to a limited problem area relevant to teaching specifically focused on the field of physics. The following areas are covered:

- formulating problems
- scientific theories and methods specializing in the problem area
- collecting, processing and analysis of material
- handling information
- research ethics
- writing an academic report
- active participation in seminars
- presenting a degree project and how to act as an opponent.

The degree project may be executed in other ways than a written report but should then be accompanied by written documentation. The degree project may preferably be connected to some didactic/scholarly education research projects and to the students' experience from their practical training.

Type of Instruction

Lectures, tutoring, self-tuition and seminars. Obligatory seminars. Teaching and tutoring may also be conducted through net based education forms.

Examination

The course is assessed with the grades Fail (U), Pass (G) or Pass with Distinction (VG).

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.

Required Reading and Additional Study Material

Required reading

Hellén, Gustav, Lindahl, Britt & Redfors, Andreas, *Lärande och undervisning i naturvetenskap - en forskningsöversikt*, Stockholm: Vetenskapsrådets rapportserie 2005/2. Pages 104 (104).

Patel, Runa & Davidsson, Bo, *Forskningsmetodikens grunder*, Lund: Studentlitteratur, 2003. Pages 145 (145).

Redish, Edward, *Teaching physics*, John Wiley, 2003. Pages 200 (200).

Strömquist, Siv, *Svenska skrivregler*, Stockholm: Liber, 2000. Pages 207 (207).

Johansson, Bo & Svedner, Per-Olof, *Examensarbetet i lärarutbildningen*, Uppsala: Kunskapsföretaget, 2001. Pages 136 (136).

Reference Literature

Backman, Jarl, *Rapporter och uppsatser*, Lund: Studentlitteratur, 1998.

Bryman, Alan, *Samhällsvetenskapliga metoder*, Malmö: Liber, 2002. Valda delar

Kvale, Steinar, *Den kvalitativa forskningsintervjun*, Lund: Studentlitteratur, 1997.

Strömdahl, Helge (red.), *Kommunicera naturvetenskap i skolan - en forskningsöversikt*. Lund: Studentlitteratur, 2002.

Strömquist, Siv, *Uppsatshandboken*. Uppsala: Hallgren & Fallgren, 2006.

Säfström, Carl-Anders & Svedner, Per Olov (red.), *Didaktik - perspektiv och problem*, Lund: Studentlitteratur, 2000.

Truss, Lynn & Halldinger, Eva, *Komma rätt, komma fel, och komma till punkt*. Stockholm: Wahlström & Widstrand, 2005.

Stockholm: Wahlström & Widstrand, 2005.

von Wright, Georg Henrik, *Vetenskapen och förnuftet*. Stockholm: Bonnier Pocket, 2005.

Widerberg, Karin, *Vetenskapligt skrivande - kreativa genvägar*.