



Course syllabus

Faculty Board of Science and Engineering
School of Computer Science, Physics and Mathematics

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

Physics

Level of classification

Second Level

Progression

A1E

Date of Ratification

Approved by Organisational Committee 2009-08-11

The course syllabus is valid from spring semester 2010

Prerequisites

To be accepted for the course the student must have completed and passed courses within general education. Furthermore, for the Teacher's Certificate, 270 credits (secondary school level), specialisation in Physics worth 90 credits and 2 specialisations worth 30 credits each or, alternatively, a specialisation worth at least 60 credits are required. For the Teacher's Certificate, 270-330 credits (upper secondary school level), specialisation/advanced studies in Physics worth 90 credits and a specialisation worth at least 60 credits are required.

Expected learning outcomes

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).

On request, students may have their credits translated to ECTS-marks. Such a request must be sent to the examiner before the grading process starts.

Course Evaluation

A written course evaluation will be carried out at the end of the course in accordance with the guidelines of the University. The course evaluation will be filed at the department.

Required Reading and Additional Study Material

Required reading

Helldén, 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).

Strömqvist, 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.

- Strömqvist, 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.
- von Wright, Georg Henrik, *Vetenskapen och förnuftet*. Stockholm: Bonnier Pocket, 2005.
- Widerberg, Karin, *Vetenskapligt skrivande – kreativa genvägar*.