Translation of Curriculum Statement for Graduate Level (Third-level) Education

Physics with specialization in Applied Nuclear Physics

Swedish title: Fysik med inriktning mot tillämpad kärnfysik

TNFYSI09

Swedish Curriculum adopted by the Board of the Faculty of Science and Technology (Board for Third-level Education) on 2008-07-02. Translation approved on 2010-08-10.

The Curriculum Statement for Third-level Education consists of three parts: a general part, this subject specialized curriculum statement, and each doctoral student's individual study plan.

Objective
Starting from basic education in the subject the Third-level Education shall give further insights into the important parts of the subject and more thorough knowledge of at least one subsubject. By supervision and thesis work the doctoral student shall become well prepared for a critical and independent research activity or for other professional work, where strong demands on thorough subject knowledge and research competence are formulated.

The doctoral student shall also be able to present her/his own goals and results orally and in writing to different target groups in English and, in the case of Swedish-speaking doctoral students, in Swedish.

Subject description
In the subject Physics with specialization in Applied Nuclear Physics basic research directed towards the society outside the University is pursued, i.e. basic research motivated and inspired by a problem outsider nuclear physics itself, or more directly technical research. Examples of such problems are energy production, medicine, measuring techniques and the connection between neutron irradiation and structural changes in matter. Neutrons play a central role in many important applications of nuclear physics, and a certain weight in the education is given to neutron interactions in nuclei and matter. The neutron physics research being carried out within the subject is mainly
experimental with theoretical elements extending from model
calculations to model development based on elementary knowledge of
the structure of matter and neutron interactions. The technical aspects
of neutron physics are also of importance. In addition the detection of
nuclear processes is central in the subject. Besides neutron detection,
registration of gamma radiation is an important field, as many
applications are based on gamma-ray detection.

Eligibility

Basic Eligibility
The basic eligibility for third level education is described in the
general part of the curriculum statement.

Special Eligibility
A person has special eligibility for a third level program in Physics
with specialization in Applied Nuclear Physics if she/he has passed
examinations in courses in physics or other courses with relevance for
the specialization, comprising at least 90 HE credits, or if she/he has
acquired the equivalent knowledge abroad.

Admission
Applicants for third level program in Physics with specialization in
Applied Nuclear Physics must submit an application to the head of the
Department of Physics and Astronomy. Admissions to places in third
level programs take place normally three times per year.

In connection with the admission it must be stated how it is planned to
finance both the personal maintenance of the doctoral student, and
her/his research.

Program structure
In connection with the admission, each doctoral student and her/his
supervisor shall draw up an individual study plan after consultation
with the professor in charge of the third level program. The plan is to
be approved by the head of the department (by delegation of the
Faculty Board), in connection with the admission.
The individual study plan shall be reviewed jointly by the doctoral
student and her/his supervisor, annually, and be provided with a
summary of the achieved results and the plans for the coming year.
Significant changes and any disagreement on the individual study plan
shall be reported to the head of the department or, if deemed necessary, to the Board for Third-level Education.

Courses
Within the third level program there may be different kinds of courses, such as lectures, literature studies, practical training, field studies, etc. The courses are intended to provide wider insights into the subject as a complement to the specialist competence acquired in the research work. The courses included in the individual study plan may partly be selected among courses given at Uppsala University and partly from courses given abroad by academies and/or summer schools. The latter course should be approved by the supervisor and responsible professor.

The list of available courses is continuously revised. As the content of the research in the subject varies over a wide range between various thesis works, no courses are compulsory. On the other hand basic courses in nuclear power technology should be included in the curriculum, if there are no special reasons not to do so, because nuclear power technology is by far the most important application of nuclear physics in the society. An example of an appropriate course in nuclear power technology is that given by the department in collaboration with the nuclear power industry.

Requirements for doctoral degree
The requirements for doctoral degree consist of on one hand passed examinations in the courses included in the approved individual study plan of each doctoral student, and on other hand passed public defense of the doctoral thesis. The program leading to the doctoral degree amounts to 240 higher education credits (four years of full-time studies), of which the thesis part amounts to a minimum of 120 higher education credits and the course part to a minimum of 60 higher education credits.

Requirements for licentiate degree
A stage of at least 120 higher education credits (two years of full-time studies) in the third level program may be completed with a licentiate degree. The requirements for this are that the doctoral student both has passed the examinations included in the program stage and has got an academic paper amounting to a minimum of 60 higher education credits passed. The course part amounts to a minimum of 30 higher education credits.
Other

Research in Physics with specialization in Applied Nuclear Physics is pursued in extensive international collaborations and presumes a widespread global information exchange. It is therefore necessary that the doctoral student can make efficient use of scientific texts in English.