FSH3101 Particle Detectors and Their Applications 7.5 credits

Partikeldetektorer och deras tillämpningar

This is a translation of the Swedish, legally binding, course syllabus.

Establishment

Course syllabus for FSH3101 valid from Spring 2010

Grading scale

G

Education cycle

Third cycle

Specific prerequisites

This course is primarily designed for students performing doctoral studies in experimental astroparticle physics or experimental particle physics. The course may also be of interest to doctoral students studying experimental nuclear physics. Other doctoral students should discuss their participation in the course with the course examiner. The course language is English.

Language of instruction

The language of instruction is specified in the course offering information in the course catalogue.

Intended learning outcomes

After completing this course, the student should have:

- Identified three aspects of particle detector physics which they wish to study in detail.
- Presented the results of their studies in the form of three research seminars to the KTH particle and astroparticle research group.
- Been able to discuss any questions arising during the seminar.
- Submitted one of the 'research seminar' topics as a written report in English and been able to discuss and expand upon the contents of the report during a subsequent oral examination.

Course contents

A selection of topics from contemporary particle detector physics, including:

- Particle interactions in materials
- Ionization measurements
- Position sensitive detectors
- Time resolving detectors
- Particle identification techniques
- Energy and momentum measurement techniques
- Detector systems and their applications

Course literature

Example literature:

- Research papers published in refereed scientific journals, especially 'Nuclear Instruments and Methods A'.
- Reports from major international particle physics laboratories, e.g.: CERN and SLAC.
- Published proceedings from international conferences, e.g.: The International Conference on Instrumentation for Colliding Beam Physics series.
- Detectors for particle radiation, K. Kleinknecht, CUP (1998).

Examination

Based on recommendation from KTH's coordinator for disabilities, the examiner will decide how to adapt an examination for students with documented disability.

The examiner may apply another examination format when re-examining individual students.

If the course is discontinued, students may request to be examined during the following two academic years.

- Three oral presentations (‘seminars’) of topics chosen from the literature sources listed below. The topics should be agreed in advance with the course examiner. Each seminar is 60 minutes long and will be advertised to members of the KTH particle and astroparticle research group. The student is expected to be able to actively discuss any questions arising from the seminar(3 credits).
- A written report (8-10 A4 pages, 11 pt, including figures) on one of the seminar topics, followed by an oral examination of the submitted material. During the oral examination the students should be able to discuss and expand upon the contents of the report.(2 credits).

Ethical approach

- All members of a group are responsible for the group's work.
- In any assessment, every student shall honestly disclose any help received and sources used.
- In an oral assessment, every student shall be able to present and answer questions about the entire assignment and solution.