UNIVERSITY OF GOTHENBURG

PHYSICS

FIM465 Modern Subatomic Detection and Analysis Methods, 7.5 higher education credits

Modern Subatomic Detection and Analysis Methods, 7,5 högskolepoäng

Second Cycle

Confirmation

This course syllabus was confirmed by Department of Physics on 2008-03-10 and was last revised on 2017-06-13 to be valid from 2017-06-13, spring semester of 2017.

Field of education: Science 100%
Department: Physics

Position in the educational system

The course FIM465, Modern subatomic detection and analysis methods, is a course within the Masters Programme of Physics. It also given as a stand-alone advanced course in physics at the Department of Physics, University of Gothenburg.

The course can be part of the following programmes: 1) Complex Adaptive Systems, Master's Programme (N2CAS), 2) Physics of Materials and Biological Systems, Master's Programme (N2PMB) and 3) Physics, Master's Programme (N2PHY)

Main field of studies	*Specialization*
Physics	A1N, Second cycle, has only first-cycle course/s as entry requirements

Entry requirements

Knowledge in subatomic physics corresponding to the course FIN135 or FYP320 is required.

Applicants must prove knowledge of English: TOEFL test result of at least 600 points (computerized 250 points, on Internet 100 points) or IELTS test result of at least 6.0, including at least 6.5 for the Writing. This requirement does not apply to students with a Bachelor degree from an English speaking university, or to students having passed

English level B at Swedish/Nordic Upper Secondary School.

Learning outcomes

Following completion of the course, the student will have obtained essential knowledge concerning a number of physical processes within subatomic physics and how these can be experimentally studied. The competence acquired aims at a level that would permit the student to afterwards participate actively in experiments at the research frontier. Specifically, this implies having attained a deep knowledge of the function of detectors for charged particles and photons understanding of the function and capability of modern electronics and data acquisition systems for experiments within Subatomic Physics an overview of the function of today s and tomorrow s most advanced complex detector systems, such as those at GSI-FAIR and CERN.

Furthermore, the student will develop topical skills leading to competence to be able to identify suitable detector types depending on which radiation type and physical parameters to be studied ability to make reasonable estimates of the resolution and efficiency of a detector capability to independently perform simple simulations of subatomic processes and their experimental observables aptitude to perform a multi-parameter analysis of experimental data from complex detector systems, leading to physical observables.

Course content

The course gives an introduction to modern detection and analysis methods within contemporary Subatomic Physics. The goal is to develop topical knowledge concerning the function and use of numerous types of detection systems to detect individual particles and gamma rays. Furthermore, to yield insight how information from several such systems can be combined to thus study underlying physical entities. In this context, a selection of experiments within today s front-line research in Subatomic Physics is studied and the simulation and analysis methods used therein.

Form of teaching

Oral exams and projects.

Language of instruction: English

Assessment

A student who has failed a test twice has the right to change examiner, unless weighty argument can be adduced. The application shall be sent to the board of the department and has to be in writing.

Grades

The grading scale comprises: Pass with Distinction (VG), Pass (G) and Fail (U).
ECTS grades are also given on this course.

Course evaluation

The results of the evaluation will be communicated to the students and will function as a guide for the development of the course.

Additional information

The course is given jointly with Chalmers University of Technology. The Chalmers code for the course is FUF065.