Module: Specialization: Experimental Physics

Module No.: physics61a

Course: Physics of Particle Detectors

Course No.: physics618

Category	Type	Language	Teaching hours	CP	Semester
Elective	Lecture with exercises	English	3+1	6	WT

Requirements for Participation:

Preparation:
Useful: physik510

Form of Testing and Examination:
Requirements for the examination (written or oral): successful work with the exercises

Length of Course:
1 semester

Aims of the Course:
Understanding the basics of the physics of particle detectors, their operation and readout

Contents of the Course:
Physics of detectors and detection mechanisms, interactions of charged particles and photons with matter, ionization detectors, drift and diffusion, gas filled wire chambers, proportional and drift chambers, semiconductor detectors, microstrip detectors, pixel detectors, radiation damage, cerenkov detectors, transition radiation detectors, scintillation detectors (anorganic crystals and plastic scintillators), electromagnetic calorimeters, hadron calorimeters, readout techniques, VLSI readout and noise

Recommended Literature:
Wermes: Skriptum and web-based Teaching Module
K. Kleinknecht; Detectors for Particle Radiation (Cambridge University Press 2nd edition 1998)
W.R. Leo; Techniques for Nuclear and Particle Detection (Springer, Heidelberg 2nd ed. 1994)
H. Spieler, Semiconductor detector system (Oxford University Press 2005)
L. Rossi, P. Fischer, T. Rohe, N. Wermes, Pixel Detectors: From Fundamentals to Applications (Springer 2006)