Module: Elective Advanced Lectures: Experimental Physics

Module No.: physics70a

Course: Advanced Gaseous Detectors - Theory and Practice (E)

Course No.: physics722

Category	Type	Language	Teaching hours	CP	Semester
Elective	Lecture with laboratory	English	3+1	6	ST

Requirements for Participation:

Preparation:
Completed B.Sc. in physics, with experience in electrodynamics, quantum mechanics, nuclear and particle physics, physics618 (Physics of Particle Detectors)

Form of Testing and Examination:
Form of examination: written or oral report

Length of Course:
1 semester

Aims of the Course:
- Design, construction, commissioning and characterization of a modern gaseous particle detector
- Simulations: GARFIELD, GEANT, FE-Methods, etc.
- Signals, Readout electronics and Data Acquisition
- Data analysis: pattern recognition methods, track fitting
- Scientific writing: report

Contents of the Course:
- Signal formation in detectors
- Microscopic processes in gaseous detectors
- Readout electronics
- Tools for detector design and simulation
- Performance criteria
- Laboratory course: commissioning of detector with sources, beam test at accelerator
- Track reconstruction

Recommended Literature:
http://root.cern.ch
http://garfieldpp.web.cern.ch/garfieldpp/
Blum, Rolandi, Riegler: Particle Detection with Drift Chambers
Spieler: Semiconductor Detector Systems