

**Modules:**

physics700 **Elective Advanced Lectures**  
 physics710 **Experimental Physics**

**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:****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