

Advanced Gaseous Detectors - Theory and Practice (E) - physics722

Degree - M.Sc. in Physics (PO von 2014)

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| <i>Module</i> | Elective Advanced Lectures: Experimental Physics |
| <i>Module No.</i> | physics70a |

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| <i>Course</i> | Advanced Gaseous Detectors - Theory and Practice (E) |
| <i>Course No.</i> | physics722 |

| Category | Type | Language | Teaching | | Semester |
|----------|-------------------------|----------|----------|----|----------|
| | | | hours | CP | |
| 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: Requirements for the examination (written or oral): submission of 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