

**Modules:**

physics70a **Elective Advanced Lectures: Experimental Physics**  
physics70b **Elective Advanced Lectures: Applied Physics**

**Course:**

## Particle Detectors and Instrumentation (E/A)

**Course No.:** physics713

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 quantum mechanics, atomic- and nuclear physics

**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:**

Designing an experiment in photoproduction on pi-0, selection and building of appropriate detectors, set-up and implementation of an experiment at ELSA

**Contents of the Course:**

Quark structure of mesons and baryons, nucleon excitation; electromagnetic probes, electron accelerators, photon beams, relativistic kinematics interaction of radiation with matter, detectors for photons, leptons and hadrons; laboratory course: setup of detectors and experiment at ELSA

**Recommended Literature:**

- B. Povh, K. Rith, C. Scholz, F. Zetsche; *Teilchen und Kerne* (Springer, Heidelberg 6. Aufl. 2004)
- Perkins; *Introduction to High Energy Physics* (Cambridge University Press 4. Aufl. 2000)
- W. R. Leo; *Techniques for Nuclear and Particle Detection* (Springer, Heidelberg 2. Ed. 1994)
- K. Kleinknecht; *Detektoren für Teilchenstrahlung* (Teubner, Wiesbaden 4. überarb. Aufl. 2005)