

**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)