## Nuclear physics II (E) - Nucl. physics II

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

| *Module* | **Elective Advanced Lectures: BCGS Courses** |
|---|---|
| *Module No.* | physics70d |

| *Course* | **Nuclear physics II (E)** |
|---|---|
| *Course No.* | Nucl. physics II |

| **Category** | **Type** | **Language** | **Teaching hours** | **CP** | **Semester** |
|---|---|---|---|---|---|
| Elective | Lecture | English | 3 | 5 | WT |

**Requirements for Participation:**

**Preparation:** Nuclear Physics I, Quantum Mechanics

**Form of Testing and Examination:** Part of the obligatory courses for area of specialisation Nuclear and Particle Physics, separate oral examination is possible exceptionally.

**Length of Course:** 1 semester

**Aims of the Course:** Study of nuclear reactions, fission and fusion.

**Contents of the Course:**

- Kinematics in nuclear reactions
- Cross section
- Rutherford scattering
- Scattering in quantum mechanics
- The Born approximation
- Partial wave analysis
- Inelastic scattering, resonances
- Optical model
- Direct, compound, spallation and fragmentation reactions
- Neutron sources and detectors
- Neutron cross sections
- Fission
- Nuclear reactors
- Fusion
- Solar fusion
- Man-made thermonuclear fusion
- Controlled thermonuclear fusion

**Recommended Literature:**

A script for parts of the course will be distributed during the course.

K.S. Krane, Introductory nuclear physics, chapters 11-14