

**Module: Elective Advanced Lectures:
BCGS Courses**

Module No.: physics70d

Course:



Nuclear physics II (E)

Course No.:

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