Nuclear and Particle Physics

Module No.: MN-P-SP-Nuc, MN-P-PN-Nuc, MN-P-WaMa Version: 20.01.2014 JJ

Course: Nuclear Physics II

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Category	Type	Language	Teaching Hours	CP	Semester
Core Course	Lecture	English	3	4.5	WiSe

Requirements for participation:
Nuclear Physics I, Quantum Mechanics

Type of module examinations:
One oral examination at the end of the module

Duration of the course:
1 semester

Aims of the course:
Study of nuclear reactions,fission and fusion. Basic principles of accelerators.

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
- Basic principles of accelerators.

Recommended literature:
A script for parts of the course will be distributed during the course.
K.S. Krane, Introductory nuclear physics, chapters 11-15,