

Secondary Area of Specialization: Nuclear and Particle Physics

Identification number	Workload	Credits	Term of studying	Frequency of occurrence	Duration
MN-P-PN-Nuc	360 h	12 CP	1 st to 2 nd semester	Details are provided online in the table "Course Offerings".	2 semesters
1	Type of lessons a) Lecture b) Exam	Contact times depending on the individual choice 1 h	Self-study times depending on the individual choice 24 h	Intended group size	
2	Aims of the module and acquired skills Understanding of the main concepts of nuclear and particle physics..				
3	Contents of the module The module is subdivided into core courses and specialized courses. 1. Core courses <ul style="list-style-type: none"> • Nuclear Physics II (3 HPW, 4.5 CP): Study of nuclear reactions, fission and fusion. • Particle Physics (3 HPW, 4.5 CP): Introduction into particle physics, accelerators and particle detectors 2. Specialized courses <ul style="list-style-type: none"> • Detector Physics (2 HPW, 3 CP) • Theoretical Nuclear Physics I (2 HPW, 3 CP) • Theoretical Nuclear Physics II (2 HPW, 3 CP) • Theoretical Nuclear Physics III (2 HPW, 3 CP) • Accelerator Mass Spectrometry (2 HPW, 3 CP) • Nuclear Astrophysics (2 HPW, 3 CP) • Neutron Physics (2 HPW, 3 CP) • Selected problems in Nuclear Structure (2 HPW, 3 CP) • Heavy Ion Physics (2 HPW, 3 CP) • Tools for Particle Physics (2 HPW, 3 CP) • Selected Topics on Future Energy Supply (2 HPW, 3 CP) • Applied Nuclear Physics (2 HPW, 3 CP) • and others, including fitting courses from Bonn University, if approved by the module coordinator The contents of the specialized courses can be found in the "kommentiertes Vorlesungsverzeichnis" and in the lecture descriptions online.				
4	Teaching/Learning methods Besides the teaching in lectures, the self-study based on books and lecture notes plays an important role. The students work individually on problem sets. In discussions with others and in the problem classes, they learn to solve challenging problems in a team and to present their approaches and results.				

5	Requirements for participation Nuclear and Particle Physics and Quantum Mechanics at the level of the bachelor courses in physics
6	Type of module examinations The module is passed by passing an oral examination covering the topics of the core courses. To be admitted to the exam, students must actively have participated in the specialized course. The grade given for the module is equal to the grade of the oral examination.
7	Requisites for the allocation of credits The secondary AoS Nuclear and Particle Physics is composed of: 1. Two core courses (6 HPW, 9 CP) 2. One specialized course in Nuclear and Particle Physics (2HPW, 3CP).
8	Compatibility with other Curricula and Soft Skills As elective subject in other M.Sc. programs.
9	Significance of the module mark for the overall grade The weight of the module is $12/111 \approx 10.8\%$.
10	Module coordinator J. Jolie
11	Additional information Detailed information on the occurrence and the course contents are provided online and in the "kommentiertes Vorlesungsverzeichnis". Version: 05.06.2015 HK