PHY-M-VE 03

Effective WS 2011/2012 / Please also see remarks in item 13.

1. Module title:	**Mathematics as Complementary Subject**
2. Field / responsibility of:	Faculty of Mathematics, Dean of Studies
3. Module contents:	For mathematics as a complementary subject, selected modules from mathematics studies in the scope of at least 16 CPs must be completed successfully. All bachelor and master courses from the field of mathematics according to the course catalog of the Faculty of Mathematics are approved. The course contents can be seen in the corresponding mathematics module descriptions. Excluded are modules PHY-B-P 11 (“Mathematics for Physicists”), PHY-B-P 2 (“Mathematical Methods and Linear Algebra”) and the courses Analysis II, Analysis III and Linear Algebra II.
4. Qualification objectives of the module / competencies to be acquired:	The students possess in-depth knowledge in selected areas of mathematics. They are experienced in scientific problems and the working techniques in mathematics.
5. Prerequisites for participation:	
a) Recommended knowledge:	Analysis I, Analysis II and III for Physicists, Linear Algebra I, Linear Algebra II, additional recommended prerequisites are given in the course descriptions
b) Prerequisite courses:	None
6. Module can be used for:	Master in Physics
7. Module is offered:	WS, SS
8. Module can be completed in:	2 semesters
9. Recommended semester of study:	1
10. Overall module workload / number of credit points:	**Workload:** **Total number of hours: 480** **Allocation:** **1. Attendance: 12 credit hours** **2. Independent study (including exam preparation/ exam): 300 hours** **Credit points: 16**
The successful completion of all assignments listed in items 11 and 12 is a prerequisite for receiving the credit points mentioned in item 10.	

11. Module components:

No.	Req./req. elective	Form of teaching	Subject area/topic	Credit hours	Coursework
PHY-M -VE 0 3.1	Required elective	Lecture Practical course	Commutative Algebra (9 CPs, from module BAlg2)	6	Successful participation in the practical course
PHY-M -VE 0 3.2	Required elective	Lecture Practical course	Functional Analysis (9 CPs, from module MAngAn)	6	Successful participation in the practical course
PHY-M -VE 0 3.3	Required elective	Lecture Practical course	Partial Differential Equations I (9 CPs, from module MAngAn)	6	Successful participation in the practical course
PHY-M -VE 0 3.4	Required elective	Lecture Practical course	Algebraic Number Theory I (9 CPs, from module MArGeo)	6	Successful participation in the practical course
PHY-M -VE 0 3.5	Required elective	Lecture Practical course	Algebraic Geometry I (9 CPs, from module MArGeo)	6	Successful participation in the practical course
PHY-M -VE 0 3.6	Required elective	Lecture Practical course	Differential Geometry I (9 CPs, from module MGAGeo)	6	Successful participation in the practical course
PHY-M -VE 0 3.7	Required elective	Lecture Practical course	Algebraic Topology I (9 CPs, from module MGAGeo)	6	Successful participation in the practical course
PHY-M -VE 0 3.8	Required elective		Additional lectures and seminars from the courses offered at the Faculty of Mathematics		

12. Module exam:

No.	Competence / topic	Type of exam	Duration	Time / notes	Weighting of module grade
PHY-M -VE 0 3.1	Commutative Algebra			Written or oral exam, 120-240 min. or 25-40 min.	See notes
PHY-M -VE 0 3.2	Functional Analysis			Written or oral exam, 120-240 min. or 25-40 min.	See notes
PHY-M -VE 0 3.3	Partial Differential Equations I			Written or oral exam, 120-240 min. or 25-40 min.	See notes
PHY-M -VE 0 3.4	Algebraic Number Theory I			Written or oral exam, 120-240 min. or 25-40 min.	See notes
PHY-M -VE 0 3.5	Algebraic Geometry I			Written or oral exam, 120-240 min. or 25-40 min.	See notes
PHY-M -VE 0 3.6	Differential Geometry I			Written or oral exam, 120-240 min. or 25-40 min.	See notes
PHY-M -VE 0 3.7	Algebraic Topology I			Written or oral exam, 120-240 min. or 25-40 min.	See notes
PHY-M -VE 0 3.8	Additional lectures and seminars from the courses offered at the Faculty of Mathematics				See notes

13. Notes:

The sub-module exams may be graded or ungraded. The share of the graded sub-module exams must reflect the performance in modules amounting to at least 8 CPs. Optionally, the module grade corresponds to a test performance in an area of competence of at least 8 CPs. All information on exams and course achievements can be found in the course descriptions of the Faculty of Mathematics.