

1. COURSE :	M.SC. PHYSICS
2. CERTIFICATE:	Master of Science
3. REGULAR DURATION:	4 semesters
CREDIT POINTS:	120 (credit points)
START FOR BEGINNERS:	Wintersemester

4. CONDITIONS:

The admission to the master course in the International Physics Studies Programme pre-requisites a successful completed Bachelor programme in physics at university level. Further certificates have to be acknowledged by the responsible and officially recognized administration. Bachelor degrees of related subjects might be acknowledged by the board of examiners. The board might dispose constrains and tests for the admission.

ADMISSION CAPACITY RESTRICTIONS: **None***

5. CONTENT:

Experimental Physics (Nuclear and Particle Physics: Accelerators and Detectors, Nuclear Models, Global Nuclear Properties, Decay, Scattering and Reactions, Nuclear Energy, Standard Model, Quark Model, Weak Interaction, Unification), Theoretical Physics (Quantum Mechanics II: Scattering Theory, Perturbation Theory, Symmetry Aspects, Relativistic Wave Equations, Statistical Physics II: Relations between Quantum Field Theory and Statistical Physics, Critical Phenomena, Non Equilibrium States, Stochastic Processes), Advanced Physics Laboratory. The non-physical subject concerns a choice from the offer of courses at Leipzig university to supplement the physics studies. Specialization according to the research interests and the advanced courses of the Physics Institutes. Research oriented master thesis work.

6. COURSE STRUCTURE:

The Master-Course consists of two one year periods. In a first phase the education in experimental and theoretical physics is upgraded. The student attends lectures exercises and lab courses in a specialized physics subject.

* Inform yourself in the Internet.

The offer of the courses for the physics specialization is according to the research interests of the physics institutes. The aim of these courses is to prepare the students for their scientific research work. This education is supplemented by a nonphysical subject, which can be chosen to support individual physical or interdisciplinary interests. The second phase of the Master-Course is the scientific research work under supervision of a senior scientist. The decision on a special topic is followed by a preparation phase (background, method, references). The intrinsic research work is expected to take about 6 month. The research phase is finished with a documentation and the defence of the thesis with discussion.

7. COURSES, MODULUS AND EXAMS SYNOPSIS:

1st semester (winter semester) / 2nd semester (summer semester)

EP7 Experimental Physics 7, (Nuclear and Particle Physics)		Extent	Modulus Exam	CP
V	1. lecture	4 SWS	written test	10
Ü	2. seminar	2 SWS		
S	3. exercises *			

TP5 Theoretical Physics, (Quantum Mechanics II and Statistical Physics II)		Extent	Modulus Exam	CP
V	1. lecture Quantum Mechanics II	4 SWS	written and oral examinations	15
Ü	2. seminar Quantum Mechanics II	2 SWS		
S	3. exercises Quantum Mechanics II *			
V	4. lecture Statistical Physics II	4 SWS		
Ü	5. seminar Statistical Physics II	2 SWS		
S	6. exercises Statistical Physics II *			

HS/EX Main Seminar, Excursion		Extent	Modulus Exam	CP
Ü + Exc	main seminar (on selected topics of modern physics) study excursion	2 SWS	talk	5

WP Physical Subject (one of the scheduled topics)	Extent	Modulus Exam	CP
Optoelectronics	varies between 5 and 8 SWS	to be announced by the lecturer: talk, written test, or oral exam	5
Astrophysik (nur auf Deutsch)			
Superconductivity			
Theoretische Physik (z.T. auf Deutsch)			
Nuclear Probes and Ion Beams			
Biophysics			
Spectroscopy			
Applied Optics			
Signal & Data Processing			

PT Laboratory/Theoreticum		Extent	Modulus Exam	CP
P	Practical work on a special topic in experimental, theoretical or computational physics (preferably in connection with the choice of the physics specialisation)	4 SWS	marks for documentation and talk	5

FP2 Advanced Physics Laboratory II		Extent	Modulus Exam	CP
P	4 Experiments to choose from: EPR, Optical Pumping, NMR, Zeeman-Effect, R-V Spectroscopy, Phonons, Optical Spectroscopy, Luminescence, X-Ray Structural Analysis, Gamma Spectroscopy, Alpha-Spectroscopy, Hall-Effect, Electric Noise, Dielectric Constant and Hysteresis Effect, Computerized Measurement, Mass Spectrometry, Franck-Hertz-Experiment	8 SWS	arithmetic mean of the single marks	5

NPW2 Non-physical Subject	Extent	Modulus Exam	CP
Signal & Data Processing	varies between 6 and 8 SWS	to be announced by the lecturer: test, talk, written exam	10
Spectroscopy			
Methods of Mass Spectrometry			
Solid State Chemistry			
Analytcs of Solid State Surfaces			
<u>or</u> (for foreign students with poor knowledge of the German language)			
Introductory German Language Course I and II	14 SWS	2 tests	10
<u>or</u> (offer in German only)			
ein einführendes Modul in Meteorologie, Allgemeine Geowissenschaften, Physische Geographie oder ein weiteres vertiefendes Modul in Mathematik, Informatik oder Chemie	gem. SO und PO der betreffenden Studiengänge	gem. SO und PO der betreffenden Studiengänge	10
<u>or</u> (offer in German only)			
ein Modul aus dem Angebot der Schlüsselqualifikationen der Universität	s. SQ-Leitfaden der Universität Leipzig	s. SQ-Leitfaden der Universität Leipzig bzw. Prüfungsordnungen der betreffenden Studiengänge	10
<u>or</u> (on application to the board of examiners; offers mainly in German)			
some modulus of further courses at the university, except pure language courses	gem. SO und PO der betreffenden Studiengänge	gem. SO und PO der betreffenden Studiengänge	10

3rd semester (winter semester) and 4th semester (summer semester)

FPH1 Research Seminar I	Extent	Modulus Exam	CP
Initial training in the physics specialization	3 SWS	talk and written report	15
FPH2 Research Seminar II	Extent	Modulus Exam	CP
Completion of the proficiency in the physics specialization	3 SWS	talk and written report	15

MA Master-Thesis		Extent	Modulus Exam	CP
	Solution of a scientific problem under supervision of a senior scientist with a final report and the defence of the thesis.	6 month	weighted average of both referee statements and defence	30

The total mark of the Master-examination is determined by a weighted average: The credit point weighted total mark of the modulus exams of the first year obtains weight 10. Each mark of the moduli of the research phase is counted single. The average of the referee statements of the thesis is considered with weight 6 and the mark of talk and discussion enters with weight 2. Passing all exams the academic degree of "Master of Science" in Physics (abbreviated by M.Sc.) is awarded by the Faculty of Physics and Earth Sciences.

Abbreviations: V= lecture, S= private study, Ü= seminar, P = lab course SWS= hours (45') per week per lecture period, CP: credit points

* In general 50% of the possible points are requested for the admission to the modulus exam.

Modules EP7, TP5, HS/EX, PT, FP1 and MA are compulsory. The board of examiners controls the compliance of the students regulations. The recognition of courses and examinations beyond the jurisdiction of the Higher Education Framework Act is in the responsibility of the board of examiners.

8. EMPLOYMENT POSSIBILITIES:

The Master of Science in physics completes the university education and represents the level of the Diploma. The academic degree qualifies to apply for admission for doctoral work (thesis research). Traditional operational areas of physicists are microelectronics, construction of scientific and medical devices, fine mechanics, engineering, optics, chemical industry, informatics and communication technology. Due to their analytic research concepts and problem solving strategies physicists jobs away from physics are common.

9. CONSULTANTS:

Faculty of Physics and Earth Sciences

Institutes for Experimental Physics

Prof. Dr. P. Esquinazi

04103 Leipzig, Linnéstr. 5, room 412 Tel.: 0341 97 32750

Institute for Theoretical Physics
Prof. Dr. R. Verch
04103 Leipzig, Am Hospitalore, room 1-L15, Tel.: 0341 97 32423
Consultation times by agreement

COURSE GUIDANCE SERVICE AND EXAMINATION OFFICE:

Kristin Burgold
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Public Times: Tu 09:00 - 12:00 a.m., 01:00 - 04:00 p.m.
Th 09:00 - 12:00 a.m., 01:00 - 03:00 p.m.
Fr 09:00 - 12:00 a.m.

The information on the course is subject to the confirmation by the board of accreditation.