1. COURSE: **B.SC. PHYSICS**

2. CERTIFICATE: Bachelor of Science

3. REGULAR DURATION: 6 semester

CREDIT POINTS: 180 credit points

START FOR BEGINNERS: **Wintersemester**

4. CONDITIONS: none

The general or subject oriented matriculation standard (12 year school) is necessary for the admission. Further certificates have to be acknowledged by the responsible and officially recognized administration. Extended school courses in mathematics and/or physics are recommended but not obligatory.

Admission Capacity Restrictions: **None**

5. CONTENT:

The Bachelor Course together with the Master Course continues the traditional university education in physics. This concerns lectures and exercises in experimental and theoretical physics, in mathematics as well as laboratory courses which will provide a broad and applicable knowledge in physics and mathematics: Experimental Physics (Mechanics, Fluid Mechanics, Acoustics, Heat, Electrics, Magnetism, Optics, Nuclear-Molecular- and Solid State Physics); Introductory and Advanced Physics Laboratory Courses; Mathematics (Linear Algebra, Advanced Differential and Integral Calculus, Sequences and Series, Complex Analysis, Abstract Spaces, Measure and Probability Theory, Distributions, Ordinary and Partial Differential Equations); Theoretical Physics (Classical Mechanics, Electromagnetic Field Theory, Special Relativity, Thermodynamics, Introductory Quantum Mechanics and Statistical Physics); Bachelor Thesis. The non-physical subject provides an introduction to chemistry or computer science. The key qualification modulus concerns a choice from a certain offer of courses at Leipzig University.

6. COURSE STRUCTURE:

The intrinsic study (compulsory -152 credit points) concerns four subjects: experimental physics (1st-6th semester), mathematics (1st-4th semester), theoretical physics (3rd-6th semester) and the physics lab course (2nd-5th semester). Non-physical and business oriented qualification (optional courses – 28 credit points should be obtained in chemistry or informatics, in the key qualification modulus as well as in the bachelor thesis work.

7. COURSES, MODULES AND EXAMS SYNOPSIS:

COURSE TOWARDS THE B. Sc. IN PHYSICS

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

EP1 Experimental Physics I, (Mechanics)		**Extent**	**Modulus Exam**	**CP**
V	1. lecture	4 SWS	written test	
Ü	2. seminar	2 SWS		
S	3. exercises *			**9**

MA1 Mathematics I, (Calculus I and Linear Algebra)		**Extent**	**Moduls Exam**	**CP**
V	1. lecture calculus I	4 SWS	written test	
Ü	2. seminar calculus I	2 SWS		
S	3. exercises calculus I *			
V	4. lecture linear algebra	4 SWS	written test	
Ü	5. seminar linear algebra	2 SWS		
S	6. exercises linear algebra *			**15**

NPW1 Nonphysical Subject, Chemstry/Informatics		**Extent**	**Modulus Exam**	**CP**
V	1. lecture chemistry	4 SWS	written test	
Ü	2. exercise chemistry	2 SWS		
P	3. chemistry laboratory course	4 SWS		**10**
Or (course offered in German only)				
V/Ü	1. Digitale Informationsverarbeitung	(2 V+1 Ü)	Klausuren oder mündliche Prüfung über die Inhalte der belegten Vorlesungen	
V/Ü	2. Programmierung und Programmiersprachen	(2 V+1 Ü)		
V/Ü	3. Algorithmen und Datenstrukturen	(2 V+1 Ü)		
V/Ü	und 4. Betriebssysteme	(2 V+1 Ü)		
V/Ü	oder 4. Datenbanksysteme 1	(2 V+1 Ü)		
V/Ü	oder 4. Grundlagen der Technischen Informatik	(2 V+1 Ü)		
V/Ü	oder 4. Einführung in die Softwaretechnik	(2 V+1 Ü)		**10**

EP2 Experimental Physics II, (Heat, Electricity I)		**Extent**	**Modulus Exam**	**CP**
V	1. lecture	4 SWS	written test	
Ü	2. seminar	2 SWS		
S	3. exercises *			**9**

MA2 Mathematics II, (Calculus II and Ordinary Differential Equations)		**Extent**	**Modulus Exam**	**CP**
V	1. lecture calculus II	4 SWS	written test	
Ü	2. seminar calculus II	2 SWS		
S	3. exercises calculus II *			
V	4. lecture ordinary differential equations	2 SWS	written test	
Ü	5. seminar ordinary differential equations	2 SWS		**12**
S	6. exercise ordinary differential equations*			

AP1 Introductory Physics Laboratory I		**Extent**	**Modulus Exam**	**CP**
P	10 Experiments on Mechanics, Heat, Electricity and Optics (one experiment evaluated as not sufficient may be repeated)	4 SWS	arithmetical mean of the single marks	**5**

3rd semester (winter semester)

EP3 Experimental Physics III, (Electricity II, Optics I)		**Extent**	**Moduls Exam**	**CP**
V	1. lecture	4 SWS	written test	
Ü	2. seminar	2 SWS		
S	3. exercises *			**9**

MA3 Mathematics III, (Calculus III, Partial Differential Equations I)		**Extent**	**Modulus Exam**	**CP**
V	1. lecture	4 SWS	written test	
Ü	2. seminar	2 SWS		
S	3. exercises *			**7**

AP2 Introductory Physics Laboratory II		**Extent**	**Moduls Exam**	**CP**
P	10 Experiments on Mechanics, Heat, Electricity and Optics (one experiment evaluated as not sufficient may be repeated)	4 SWS	arthimetical mean of the single marks	**5**

TP1 Theoretical Physics I (Mechanics)		**Extent**	**Modulus Exam**	**CP**
V	1. lecture	4 SWS	written test	
Ü	2. seminar	2 SWS		
S	3. exercises *			**9**

4th semester (summer semester)

EP4 Experimental Physics IV, (Optics II, Nuclear Physics)		**Extent**	**Modulus Exam**	**CP**
V	1. lecture	4 SWS	written test	
Ü	2. seminar	2 SWS		
S	3. exercises *			**9**

MA4 Mathematics IV, (Calculus IV, Partial Differential Equations II)		**Extent**	**Modulus Exam**	**CP**
V	1. lecture	4 SWS	written test	
Ü	2. seminar	2 SWS		
S	3. exercises*			**7**

AP3 Introductory Physics Laboratory III		**Extent**	**Modulus Exam**	**CP**
P	10 Experiments on Mechanics, Heat, Electricity and Optics (one experiment evaluated as not sufficient may be repeated)	4 SWS	arithmetical mean of the single marks	**5**

TP2 Theoretical Physics II (Elektrodynamics)		**Extent**	**Modulus Exam**	**CP**
V	1. lecture	4 SWS	written test	
Ü	2. seminar	2 SWS		
S	3. exercises *			**9**

5th semester (winter semester)/6th semester (summer semester)

EP5 Experimental Physics V, (Molecular Physics)		**Extent**	**Modulus Exam**	**CP**
V	1. lecture	4 SWS	written test	
Ü	2. seminar	2 SWS		
S	3. exercises *			**9**

TP3 Theoretical Physics III (Quantum Mechanics I)		**Extent**	**Modulus Exam**	**CP**
V	1. lecture	4 SWS	written test	
Ü	2. seminar	2 SWS		
S	3. exercises *			**9**

FP1 Advanced Physics Laboratory I		**Extent**	**Modulus Exam**	**CP**
P	4 Experiments to choose from: EPR, Optical Pumping, NMR, Zeeman-Effect, R-V Spectroscopy, Phonons, Optical Spectroscopy, Luminescense, X-Ray Structural Analysis, Gamma Spectroscopy, Alpha-Spectroscopy, Hall-Effect, Electric Noise, Dielectric Constant and Hysteresis, Computerized Measurements, Mass-Spectrometry, Franck-Hertz-Experiment	8 SWS	arithmetical mean of the single marks	**5**

EP6 Experimental Physics VI, (Solid State Physics)		**Extent**	**Modulus Exam**	**CP**
V	1. lecture	4 SWS	written test	
Ü	2. seminar	2 SWS		
S	3. exercises *			**9**

TP4 Theoretical Physics IV (Thermodynamics/Statistical Physics I)		**Extent**	**Modulus Exam**	**CP**
V	1. lecture	4 SWS	written test	
Ü	2. seminar	2 SWS		
S	3. exercises *			**9**

SQ1 Key Qualification	**Extent**	**Modulus Exam**	**CP**
for non-native German speakers:			
Introductory German Language Course I and II (participation already in the first and second semester possible and recommended)	14 SWS	2 tests	**10**
Or (offer in German language only)			
Aktuelle Fragen der Lebenswissenschaften	s. SQ-Leitfaden der Universität Leipzig	s. SQ-Leitfaden der Universität Leipzig bzw. Prüfungsordnungen der zugeordneten Studiengänge	
Chemie im Alltag – Fluch oder Segen?			
Naturwissenschaft für Querdenker			
Mensch-Natur-Kultur			
Orientierung durch Geschichte			
Paradigmen und Konzepte in der Kunst- und Kulturgeschichte Europas			
Kulturen Asiens und Afrikas			
Einführung in das Recht und die Rechtswissenschaft			
Content Management			
Digitale Informationsverarbeitung			
Kulturgeschichte der Naturwissenschaften			
Interkulturelle Kommunikation			
Literarisches Schreiben			
Energie und Umwelt			
Politik, Rhetorik, Philosophie			
Technik und Gesellschaft			
Der Körper im Kontext von Leistung, Gesundheit und Geschlecht			
Arbeits- und Lernprozesse an der Universität selbst managen			
Geschichte und Kultur des Christentums			
Einführung in die Wirtschaftswissenschaften			
Stadt und Umwelt: Planen, Bauen, Bewirtschaften			
Genderkompetenz			**10**

BA Bachelor-Thesis		**Extent**	**Modulus Exam**	**CP**
	Solution of a scientific problem under supervision of a senior scientist with documentation of the result. The Bachelor-Thesis	240 hours	mean of both referee statements	**8**

The total mark of the Bachelor-Examination is calculated by the mean value of all modules-marks and the evaluation of the Bachelor - thesis. Passing the exams the academic degree of „Bachelor of Science" in Physics (abbreviated by B. 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 EP1-EP6, TP1-TP4, MA1-MA4, AP1-AP4, FP1 and BA are compulsory education. The non-physical subject is to be chosen between chemistry and informatics. Non-native German speakers should attend the (2 semester) introductory German language course at the very beginning of their studies. The other students should select the key qualification modulus from the special offer at Leipzig University. The board of examiners decides on the comparability of modulus exams done at other universities and monitors the application of the students and examination regulations. The board of examiners only is allowed to justify deviances from these regulations on the basis of applications in written form.

8. EMPLOYMENT POSSIBILITIES:

The Bachelor-Programme provides the basic knowledge, capabilities and scientific methods for the independent business and research work in physics or on related topics. The graduates are able for further autonomous scientific education. Traditional fields of physicists' employments are for instance microelectronics, construction of scientific and medical devices, fine mechanics, engineering, optics, chemical industry and communication technology. Due to the educated analytic research concepts and problem solving strategies physicists jobs away form physics are quiet common. The successful Bachelor in Physics however, is invited to continue her/his education in form of the Master-Studies in physics or in a related subject.

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

COURSE GUIDANCE SERVICE AND EXAMINATION OFFICE:

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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.

Die Informationen stehen unter dem Vorbehalt noch möglicher Änderungen der Studiendokumente.

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