

STUDY GUIDE

BACHELOR OF SCIENCE

Physics **(International Physics Studies Program)**

Zentrale Studienberatung

UNIVERSITÄT LEIPZIG

1. STUDY PROGRAMME:	B.SC. PHYSICS (International Physics Studies Program)
2. DEGREE AWARDED:	Bachelor of Science
3. STANDARD PERIOD OF STUDY:	6 semester
CREDIT POINTS:	180 credit points (CP)
COMMENCEMENT OF STUDIES FOR NEW STUDENTS:	winter semester

4. ENTRY REQUIREMENTS:

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.

Applicants whose native language is not English need to submit a B2 - level certificate. Alternatively, a proof of a minimum of 500 hours of English can be provided in form of a transcript of the secondary school certificate or a letter of confirmation from the secondary school.

International applicants need to apply through the university application service for international students (uni-assist e.V.: www.uni-assist.de). They are also guided by the web page of the international office at Leipzig university: www.uni-leipzig.de/+international-applicants

ADMISSION RESTRICTIONS:	None*
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5. PROGRAMME CONTENT:

Aim of the Bachelor of Science course is to acquire fundamental knowledge and methods in physics such that graduates gain a first overview of the scope of physical insight and physics research as well as the application potential. This is achieved in courses of experimental and theoretical physics, in mathematics and in the laboratory; all these courses aim both at fundamental and application relevant knowledge. The obligatory education is complemented by courses that might be chosen either from a topical physics research area or from a non-physics specialization, e.g. in chemistry, information technology or mathematics and might be further supplemented by a German language course. The study program is completed by a scientific project, the B.Sc. thesis. An indispensable tool of physics is mathematics. Therefore the participation in a bridge course in mathematics is recommended, but is not compulsory. At the beginning of your studies the learning of essential mathematical techniques is supported in courses on mathematical methods by highlighting these techniques by the application to fundamental physics problems.

* Please look online for the information you require.

In graduating in the B. Sc. Physics you acquire fundamental competences in physics, measurement technology and applied mathematics. This guarantees a head start in the job market that presents rapidly changing challenges to graduates. Moreover, the B.Sc. in Physics is the ideal starting point to embark on a M.Sc. program in physics.

6. PROGRAMME STRUCTURE:

The course contents are taught in single, organizationally independent units (modules). Modules contain clearly defined areas of knowledge that have a factual or thematic relationship. Modules might contain various teaching units, e.g. lectures (L), seminars (S) or laboratories (P) and are concluded by a final exam. Modules are rated by their teaching load in credit points (CP); one credit point corresponds to an average teaching load of 30 hours.

There are three basic forms of modules:

- Compulsory modules: have to be completed by all students
- Compulsory elective modules of choice: the students can choose from a thematically restricted pool of modules
- Electives: students can choose them freely.

The B. Sc. course in Physics is concluded with the B. Sc. thesis (12 CP).

7. OVERVIEW OF CURRICULUM, MODULES AND EXAMINATIONS:

1. Semester	2. Semester	3. Semester	4. Semester	5. Semester	6. Semester
EP1 – Mechanics and Waves 10 CP, L/S/P	EP2 – Electricity & Wave Optics 10 CP, L/S/P	EP3 – Atoms and Molecules 10 CP, L/S/P	EP4 – Thermodynamics and Soft Matter 7 CP, L/S	EP5 – Solid State Physics 7 CP, L/S	
TP1 – Classical Mechanics 1 8 CP, L/S	TP2 – Electrodynamics 1 8 CP, L/S	TP3– Classical Mechanics 2 and Electrodynamics 2 8 CP, L/S	TP4 – Quantum Mechanics 8 CP, L/S	TP5 – Statistical Physics 8 CP, L/S	
MA1 – Linear Algebra & Calculus of Functions of One Variable 7 CP, L/S	MA2 – Calculus of Functions of More Than One Variable 7 CP, L/S	MA3 – Vector Calculus and Partial Differential Equations 7 CP, L/S	NUM - Numerical Methods in Physics 6 CP, L/S		Electives II (8 CP)
Chemistry/ Language Course 5 CP, L/S	Computational Software/ Language Course 5 CP, L/S	Science Communication/ Language Course 5 CP, L/S	FP - Advanced Laboratory Course 9 CP, P	Electives III (5 CP)	Electives III (10 CP)
				PC - Project Course 10 CP	Bachelor thesis 12 CP

Abbreviations: EP= Experimental Physics, TP= Theoretical Physics, MA= Mathematics, L= lecture, S= seminar, P= lab course, CP= credit points. Except for the B.Sc. thesis all modules are concluded with an exam.

Modules EP1-EP5, TP1-TP5, MA1-MA3, FP, NUM and PC are obligatory. The non-physical subjects have to be chosen between chemistry, computational software, the introductory German language course (which are compulsory for international students) and the English course for Physicists.

Electives II:

Mathematics 4 - Further Mathematics for Physicists

- Quantum Mechanics 2
- Statistical Physics 2

Electives III:

- Semiconductors I
- Laboratory Work in Semiconductors
- Introduction to Photonics I
- Spin Resonance I
- Ion Beams I
- Superconductivity I
- Astrophysics I - Star Physics
- Electronics I
- Quantum Physics of Nanostructures
- Physics of Porous Materials I
- Introduction to Computer Simulation I
- Introduction to Chemistry
- Introduction to Computational Software
- Science Communication

unless the last three courses were already chosen in the first three semesters.

8. CAREERS:

The B.Sc. physics program provides the basic knowledge, capabilities and scientific methods for employment in industry and research work in physics or related fields. The graduates have reached a state of knowledge and practice that enables them for further scientific self-education. Traditional fields of physicists' employment are for instance microelectronics, scientific and medical device construction, fine mechanics, engineering, optics, industrial chemical processing and communication technology. Due to the acquirement of analytical research competences and problem solving strategies during their studies, physicists are often sought for even in areas quite unrelated to physics, e.g. in management consultancies. The successful Bachelor in Physics however, is invited to continue her/his education in the form of master studies in physics or in a related subject.

9. COURSE ADVISOR:

Experimental Physics:

Prof. Dr. Pablo Esquinazi
Felix-Bloch-Institute for Solid State Physics
Faculty of Physics and Earth Sciences
04103 Leipzig, Linnéstraße 5, room 412
Tel.: 0341 97 32750

Theoretical Physics:

Prof. Dr. Klaus Kroy
Institute of Theoretical Physics
Faculty of Physics and Earth Sciences
04103 Leipzig, Brüderstraße 16, room 307
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COURSE GUIDANCE SERVICE AND EXAMINATION OFFICE:

Kristin Riedel
Isabell Schulthoff, M.A.
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Faculty of Physics and Earth Sciences
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E-Mail: studium.phys.geo@uni-leipzig.de

Opening times: Tu 09:00 - 12:00 a.m., 01:00 - 03:30 p.m.
 Th 09:00 - 12:00 a.m.

Dr. Konrad Schiele
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CONTACT WITH STUDENTS:

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