

Materials Physics

Master of Science

1. Content of the degree programme

Materials physics examines the physical properties of materials. This understanding forms the basis for the development of new materials with previously unachieved functionalities for future key technologies; some of the most important are: new materials, nanotechnology and biomaterials. Modern materials research is an interdisciplinary field, a fact that is reflected in the degree programme.

Materials physics has applications in a wide range of fields, from materials engineering and medicine to climate protection through efficient use of resources.

The Master's degree programme follows on from Bachelor's degree programmes in related subjects (physics, materials physics, chemistry, nanotechnology, etc.). During the first two semesters of the strongly research-oriented Master's degree programme, students focus on their chosen specialisations. This expertise is then applied during a two-semester research phase that forms part of a Master's thesis on current materials research. The aim of the degree programme is for graduates to be able to carry out independent research in materials physics in a university or industrial setting.

2. Structure of the degree programme

Graduates with a Bachelor's degree in materials physics or a related science or engineering subject can continue their scientific education with a Master's degree in materials physics. The regular duration of the degree programme, which includes the examinations and work on the Master's thesis, is four semesters. The first two semesters of the Master's degree programme make up the specialisation phase, which is based on the Bachelor's programme, and the last two semesters are the research phase, during which students work on their Master's thesis and continue to refine their knowledge. The Master's thesis should be on a subject from materials physics and will usually be supervised by a lecturer from the Department of Physics. The Master's thesis proves students' ability for independent scientific work with the methods of physics. Students who complete a Master's degree achieve a total of 120 ECTS credits, which includes all required module examinations and the modules Master's Thesis and Master's Colloquium.

As of the summer semester 2015, Materials Physics is taught entirely in English. All courses are taught in English; examinations may be taken in German upon request.

For more information on the content, structure and orientation of Materials Physics, see Appendix 1.

3. Admission requirements

The requirement for admission to the Master's degree programme is an undergraduate degree from a university in a related subject. Applicants should have completed this degree with an overall grade of at least 2.5 or equivalent. English proficiency (level B2 CEFR) is required and may be proven through six years of English classes at a German secondary school (Gymnasium). Qualification or aptitude for the Master's degree programme is examined in the qualification assessment process. For further information on the qualification assessment process, please see the examination regulations of the degree programme. [2]

Applications for the qualification assessment process must be submitted to the Master's Office online via 'campo' and by post; the deadline is 15 July for the winter semester and 15 January for the summer semester. [7]

4. Career prospects

Materials physicists are excellently qualified for modern materials research in an interdisciplinary environment. They possess analytical problem solving skills and specialised expertise. Thanks to the degree programme's focus on modern materials research, graduates can look forward to careers not only in fundamental research but also in many fields in industry. Metalworking, semiconductor fabrication, medical engineering and biotechnology are highly suitable for materials physicists. As the degree programme is taught in English, it is open for students from other countries and graduates are suitable for positions at international companies and research institutions.

5. Addresses

Department of Physics

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Student advisors for Materials Physics

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Phone: +49 9131 85 23333 or 24444,

Office hours: Mon–Wed 8 a.m. – 4 p.m., Thu 8 a.m. – 6 p.m.,
Fri 8 a.m. – 2 p.m.

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6. More information online

- [1] Materials Physics degree programme website
www.physik.fau.de/studium/materialphysik-bm
- [2] Examination regulations of the degree programme
www.zuv.fau.de/universitaet/organisation/recht/studiensatzungen/NAT1/pdf-englisch/P15106_PrO_BA_MA_Materialphysik_Oktober2014_en_28-04-15.pdf
- [3] Examinations representative
www.fau.de/einrichtungen/pruefungsamt
- [4] Information for students transferring from other universities:
www.fau.de/studium/vor-dem-studium/zugang-zum-studium/hochschulwechsel/
- [5] FAU course catalogue: www.vorlesungsverzeichnis.fau.de
- [6] Doctoral regulations of the Faculty of Sciences:
www.fau.de/universitaet/organisation/recht/studiensatzungen/NAT1/PO_Naturwissenschaften.pdf
- [7] Information on application for Master's degree programmes:
www.fau.eu/international/international-applicants/bachelors-masters-state-examinations/admission-requirements/applying-for-masters-degree-programmes/
- [8] List of Master's degree programmes:
www.fau.eu/study/prospective-students/degree-programmes/masters-degree-programmes/

Appendix 1: Study plan – Materials Physics

Semester	Module name	ECTS	SWS	Weighting	Notes
1st	TFP-MAT Theoretical Physics: Solid State Physics	10	7	1	
	EPM-MAT Experimental Physics of Modern Materials	10	7	1	
	PWM-1-MAT Materials Physics Elective Course	5	3	1	
	WP-1-MAT Advanced Lab Courses and Projects 1	5	3	1	
	NWM-1-MAT Elective Course (chemistry or materials science) 1	(5)	(4)	1	One of the NWM-MAT modules required
Intermediate total 1st semester		30	20		
2nd	TV-MAT Advanced Theoretical Physics	(10)	(7)	1	One of the modules TFP-1-MAT or TV-MAT required
	EV-MAT Advanced Experimental Solid State Physics	10	7	1	
	PWM-2-MAT Materials Physics Elective Course	5	3	1	
	WP-2-MAT Advanced Lab Courses and Projects 2	5	3	1	
	NWM-2-MAT Elective Course (chemistry or materials science) 2	5	4	1	
	PSM-MAT Seminar in Materials Physics	5	2	1	
Intermediate total 2nd semester		30	19		
3rd	FO-1-MAT: Specialisation Phase (subject of the Master's Thesis)	15	2	Ungraded	
	FO-2-MAT: Project planning and preparation	15	8	Ungraded	
Intermediate total 3th semester		30	10		
4th	FO-3-MAT: Master's thesis	25		2	
	FO-4-MAT: Master's colloquium	5		2	
Intermediate total 4th semester		30			
Total without SWS FO-3-MAT through FO-4-MAT		120	49		

* SWS = semester hours per week