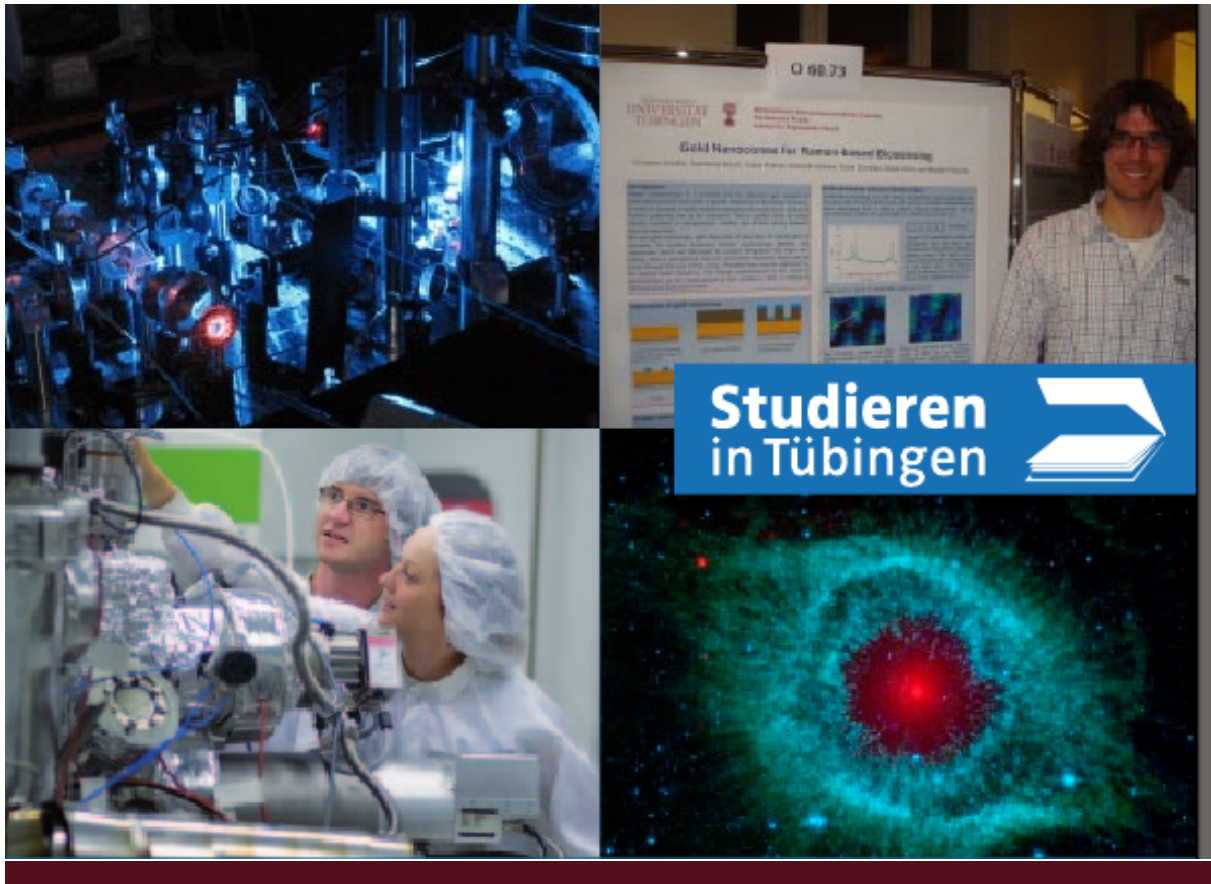


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**Module Handbook:
Physics
Master of Science**

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Faculty of Science
Department of Physics



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1 Description of the Programme

1.1 Objectives of the Programme

The Master of Science Programme in Physics is a research-oriented one-year Master programme of the Physics Department within the Faculty of Science at the University of Tübingen. In the Master Programme, students not only acquire and expand their practical skills, but also deepen their theoretical knowledge in the field of physics. They also focus on one of the research disciplines in experimental and/or theoretical physics.

The graduates of this Master Programme receive a comprehensive education in both experimental and theoretical physics and are well prepared for the demands in industry and research-oriented institutions. The entire course of studies will be pursued in either English or German. This helps prepare students for the increasing internationalization in industry and modern society. With the Master degree in physics students are qualified for entering a professional career or a Ph.D. in the field of physics or a closely related advanced study programme. Presently many physicists educated at the University of Tübingen work in technology- and research-oriented companies, and graduates of the Master Programme will likely enter a job market with a strong demand for highly skilled professionals.

The overall study objectives of the Master programme are as follows:

- Our students learn to independently plan and carry out original scientific research in physics and to critically evaluate and compare their findings with published results.
- The graduate will be trained in a specific field of physics, allowing access to current international research in this field.
- Our graduates are capable of critically scrutinizing the suitability of specific scientific methods for studying various physics-related questions. In addition, they will be able to combine different techniques to make complex physical problems accessible.
- Graduates can present the scientific findings of their research both orally and in writing. Moreover, in discussions they are skilled to answer scientific questions in a proficient manner. At scientific meetings, they can communicate in English or German with experts in the field and contribute to discussions on current physics related topics.
- Graduates acquire social skills in the research phase. In accordance with good scientific practice, they develop a conscious responsibility towards science and its possible consequences for the environment and society.

1.2 Concept and requirements of the programme

The Master Programme is a one-year consecutive study following the four-year Bachelor Programme in physics. It can be started both in the summer and winter term. To participate in the MSc programme a Bachelor degree in Physics or a similar degree is required. The Exam Committee (Prüfungsausschuss) determines the equivalence of the degree and possible complementary requirements such as additional lectures or lab classes that have to be taken.

For graduates of a four-year Bachelor Programme in physics (or an equivalent degree) the one-year Master programme consists of the modules "Scientific Specialisation", "Methods and Project Planning" (each with 15 credit points) and the "Master Thesis" (30 credit points). All three modules will be normally carried out in the work group of the supervisor of the master thesis.

The module "Scientific Specialisation" consists of the subject-specific preparation of the master thesis. Thereby ideas should be developed and knowledge acquired to prepare for the specific topic of the master thesis. By studying specialised literature the chosen topic of the master thesis should

be put into the context of current research. The module “Methods and Project Planing” contains organisational preparation of the master thesis. Thereby a project plan for the research topic should be developed and specified.

Graduates of a three-year Bachelor programme in physics (or an equivalent degree) can also be accepted in the Master Programme in physics. In this case the student must acquire additionally so-called “bridging modules” corresponding to 60 credit points at the beginning of the master studies. These “bridging modules” encompass modules of a field of specialization with 21 credit points (including a one-hour oral exam in the field of specialization), as well as other modules from the bachelor programme of physics of 39 credit points. The selection of these bridging modules should be a complement to previously completed bachelor studies and has to be approved by the examination committee.

The language of instruction and examination in the Physics Master program is either English or German. For the English version of the Master program no proof of German knowledge is necessary. An adequate knowledge of English is required (level B2 of the Common European Framework of Reference for Languages). For the German version no explicit English skills need be demonstrated, but basic knowledge of the English language is very useful. An appropriate knowledge of German is required (level B2-C1 of the Common European Framework of Reference for Languages). In the selection of the bridging courses it will be ensured that these modules can be studied in the selected language (English or German). The final grade of the MSc. in Physics is the grade of the Master Thesis.

2 Module Overview

To complete the program students have to earn in total 60 credit points from a suite of compulsory modules.

2.1 Overview by modules

The following list contains the modules offered within the Master Programme *Physics*.

Module Code	Obligatory / Elective	Module Title	Recommended Semester	Credit Points
FSMA	O	Scientific Specialisation	1	15
MKPP	O	Methods and Project Planning	1	15
MA	O	Master Thesis	2	30

2.2 Overview by Study Progress and Credit Requirements

The following table gives an overview on the Study Progress (abbreviations are explained in the next section)

		Assessment				Course			Semester	
		Grading	Type of Exam	Duration	Weight	Contact Hours	Status	Type of Course	1.	2.
The allocation of CPs to courses is for information only. Credits are only awarded upon completion of the module.									The allocation of exams to semesters is a recommendation only. Compulsory allocations are marked as such.	
									CP	CP
MKPP	Methods and project planning	ng				30	o	PR	15	
FSMA	Scientific specialisation	ng				30	o	PR	15	
MA	Master Thesis	g	MT		100	60	o	MT		30
Total (Credit Points)									30	30

3 Module Descriptions

The following abbreviations are used in the individual module prescriptions and in the previous overview of the study progress.

Key	
Grading	g = graded; ng = not graded (pass/fail); ne = no module examination
Type of Exam	W = written exam; O = oral exam; T = term paper; P = classroom presentation, A = assignment / term paper, written report
Duration:	duration of the examination in minutes
Weight:	courses: weighting of the examination grade towards the module grade modules: weighting of the module grade towards the final grade
Contact Hours:	CH; hours spent in the classroom per week during the semester
Status:	o = obligatory; e = elective
Type of Course	L = lecture; S = seminar; E = exercise; T = tutorial, P = practical work, PR = project related research, MT = Master Thesis
CP:	Credit Points (ECTS Credits)

Module Code: FSMA	Module Title: Scientific Specialisation		Type of Module: obligatory						
CP: (ECTS credits)	15								
Workload: - Time in Class - Self-Study	Total workload: 450 h	Contact Time: 0 h	Self-Study: 450 h						
Duration:	1 Semester								
Frequency:	Every semester.								
Language of Instruction:	English or German.								
Forms of Teaching and Learning:	Advising the students to perform independent scientific research.								
Content:	This module serves to define a specific scientific project in theoretical or experimental physics. To prepare the Master Thesis the student will pursue the scientific specialisation in a research group in which she/he will prepare the Thesis.								
Objectives:	The students are able to formulate independently an own research project and situate it within current scholarly debates. They are capable of developing own solution methods and present them in an appropriate manner. They can react appropriately to the feedback of peers and faculty, and they are also able to understand and provide feedback on other students' projects.								
Requirements for Obtaining Credit, Grading, weight if appl.	Module Components	Type of course	Status	CH	CP	Type of Exam	Length of Exam	Evaluation Type	Weight for Grade
	Project related work	PR	o	-	15	-	-	ng	-
Transfer:	The module prepares for the research in the subject of the Master Thesis. Can be used for the MSc in Physics								
Prerequisites:	None.								

Module Code: MKPP	Module Title: Methods and Project Planning.			Type of Module: obligatory					
CP: (ECTS credits)	15								
Workload: - Time in Class - Self-Study	Total workload: 450 h	Contact Time: 30 h/ 2 CH	Self-Study: 420 h						
Duration:	1 Semester								
Frequency:	Every semester								
Language of Instruction:	English or German.								
Forms of Teaching and Learning:	Advising the student to scientific methods and project planning, presentation.								
Content:	The module serves to teach the student methods of project management. The formulation, presentation and discussion of the project plan for the own research project will be done together with the supervisor. The project will be done in the research group in which the Master Thesis will be prepared. At the beginning of the module the supervisor will present the topic of the Thesis.								
Objectives:	The students are able to prepare independently (albeit under the supervision of an adviser) a larger research project and to present it in an appropriate fashion. They critically evaluate secondary sources and situate their project within current scholarly discourses. They are able to demonstrate that they have acquired general knowledge and can critically discuss special topics of their choice against this background.								
Requirements for Obtaining Credit, Grading, weight if appl.	Module Component	Type of course	Status	CH	CP	Type of Exam	Length of Exam	Evaluation Type	Weight for Grade
	Project related research	PR	o	-	12	-	-	ng	-
	Working group seminar	S	o	2	3	-	-	ng	-
Transfer:	The module prepares for the research in the subject of the Master Thesis. Can be used for the MSc in Physics.								
Prerequisites:	None								

Module Code: MA	Module Title: Master Thesis.		Type of Module: obligatory						
CP: (ECTS credits)	30								
Workload: - Time in Class - Self-Study	Total workload: 900 h	Contact Time: 0 h	Self-Study: 900 h						
Duration:	1 Semester								
Frequency:	Every semester								
Language of Instruction:	English or German.								
Forms of Teaching and Learning:	Independent research project under supervision (100%).								
Content:	Scientific research, method developments, and/or laboratory tasks, preparation of a scientific essay								
Objectives:	After successful completion of the master thesis, students have acquired profound skills in state-of-the art methods in Physics. They are acquainted with the current scientific questions and recent publications in their research field. They are trained in compiling and analyzing scientific data and writing a scientific report. In addition to scientific expertise, students will acquire soft skills, such as time and project management, working in international, interdisciplinary teams, English communication and writing skills, and rules of responsible conduct of research. Overall, with successful completion of the master thesis, students proof their scientific competence and demonstrate that they are well prepared to tackle demanding research projects such as, for example, a doctoral thesis.								
Requirements for Obtaining Credit, Grading, weight if appl.		Type of course	Status	CH	CP	Type of Exam	Length of Exam	Evaluation Type	Weight for Grade
	Module Component	MT	o	-	30	A	-	g	1.0
Transfer:	The module is the final one of the Master programme Can be used for the MSc in Physics								
Prerequisites:	Completion of required modules "Scientific Spezialisaton" and "Methods and Project Planning".								