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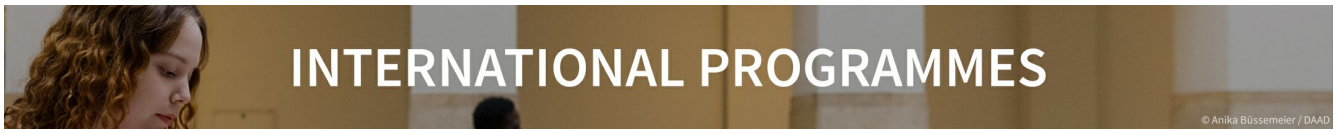

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Master's degree

Quantum Engineering

Saarland University • **Saarbrücken**

Overview

Degree	Master of Science
Teaching language	• English
Languages	Mandatory courses are held in English, some elective courses are offered in German. In any case, the Master's can be completed with English only. Participants can choose to write the Master's thesis in either language.
Full-time / part-time	• full-time • part-time (study alongside work)
Mode of study	Fully on-site with voluntary online elements
Programme duration	4 semesters
Beginning	Winter and summer semester
Application deadline	• 1 March for the following summer semester • 1 September for the following winter semester
Tuition fees per semester in EUR	None
Combined Master's degree / PhD programme	No
Joint degree / double degree programme	No
Description/content	Quantum Engineering provides cross-disciplinary training between knowledge-oriented natural sciences, especially physics, and application-oriented engineering, especially systems engineering. The Master's programme provides in-depth training in the complementary core areas of physics and engineering, targeted at the research, development and implementation of quantum technologies. In addition, students can set individual priorities for a theoretical, experimental or applied profile. The students select courses from the core areas of quantum physics and systems engineering and expand them in the context of specific elective subjects, seminars and (project) lab work that can be selected from a wide range of topics. The general elective courses allow further deepening, practical implementation and the acquisition of interdisciplinary scientific competences in economics modules or language courses based on individual preferences and goals, for example. A laboratory project and an associated project seminar serve as an introduction to the Master's

	thesis, which is written in research groups. Graduates of the "Quantum Engineering" Master's programme have a wide range of career opportunities. They can pursue a doctorate and work in research, or they can take up activities in high-tech development, in manufacturing or sales in the very latest quantum technologies, which are currently poised to leap from the world of research into broad application.

Course Details

Course organisation	The research-oriented Master's programme in "Quantum Engineering" comprises a total of 120 CP. 15 of these CP are allotted to a laboratory project, which will familiarise students with a scientific topic, and 30 CP will go towards the final Master's thesis. The duration of the Master's thesis, which includes the Master's colloquium, is six months. The required study modules are divided into the categories: "core area quantum physics", "core area systems engineering", "subject-specific compulsory choice", "subject-specific seminars, lab work and project seminars", "general elective courses", "laboratory project" and "Master's thesis". In the Master's programme, knowledge is specifically expanded through in-depth courses in quantum physics and systems engineering, where first individual options are already available. The individual professional orientation takes place via a selection of further subject-specific elective subjects as well as laboratory work and/ or (team) projects from common catalogues in physics and systems engineering. Depending on individual inclination, general elective courses allow further specialisation or the development of interdisciplinary scientific competences. In addition to courses from a wide range of subjects, it is possible to work as a tutor at the university as well as have an internship in the industry or a research facility. The laboratory project leading up to the Master's thesis and the Master's thesis itself, convey the ability for independent scientific research. Through the intensive involvement in a research group in this phase of the programme, the students also acquire teamwork and communication skills. After four semesters of regular study time, the Quantum Engineering Master's programme is completed with the degree Master of Science (MSc).
A Diploma supplement will be issued	Yes
International elements	• Projects with partners in Germany and abroad
Description of other international elements	Professors cooperate with many international partners via the "University of the greater Region UGR" and the "Transform4Europe T4E" network as well as personal research collaborations. Topics for Master's theses, in particular, are often offered in these contexts.
Diverse intercultural background of students	Strong international profile: twenty percent of the student body are international students, a large number of overseas scholars and researchers, over 120 nationalities represented on campus.
Integrated internships	The programme contains an optional internship (up to 9 CP) within the industry. This can be done with international companies or local companies that work internationally.
Course-specific, integrated German language courses	No
Course-specific, integrated	No

English language courses	

Costs / Funding

Tuition fees per semester in EUR	None
Semester contribution	Payment to Studierendenwerk Saarland (Saarland Student Services): 121.20 EUR Personal accident, theft and public liability insurance: 1.30 EUR Payment to the General Student Committee (AStA): 13 EUR Administrative charge: 50 EUR Semester travel ticket (free public transport throughout the state of Saarland): 133 EUR **Total: 318.50 EUR**
Costs of living	Students in Saarbrücken benefit from the moderate living costs.
Funding opportunities within the university	Yes
Description of the above-mentioned funding opportunities within the university	ERASMUS+

Requirements / Registration

Academic admission requirements	Requirements for the Master's programme in Quantum Engineering are:
	
	• A Bachelor's degree from a German university or an equivalent degree from a foreign university with a focus on quantum engineering or a subject related to quantum engineering,
	• Adequate language skills (usually level B2 of the European reference framework, comparable or better) in English
	• Candidates have to demonstrate their special qualification for this programme. The criteria that determine qualification are the achievements in the prior academic career, proven by:
	  ◦ an overall grade of "good" (2.5) or better in the Bachelor's degree,
	  ◦ suitable course and subject content of the acquired Bachelor's degree
	• Assessment reports could be required. In the following subject areas, the CP specified below should at least be proven in lectures and exercises as part of the previous degree:
	  ◦ 36 CP in experimental and theoretical physics in the areas: mechanics, optics, atomic physics, solid state physics and quantum mechanics
	  ◦ 12 CP in fundamentals of electrical engineering, measurement science and technology as well as sensors and instrumentation
	  ◦ 8 CP in electrodynamics or electromagnetics,
	  ◦ 10 CP in electronics and circuit technology
	  ◦ 20 CP in mathematical basics
	  ◦ 12 CP in the context of physical and engineering lab work
	
	These criteria are checked by the departments during the admission procedure, based on the data provided in the online application.
	
	If your application is accepted, you will be informed in advance via e-mail. You will also receive an official admission letter by regular mail. This admission letter serves as proof of acceptance of your application and is a requirement for enrolling in the Master's programme.

Language requirements	Adequate language skills (usually level B2 of the European reference framework, comparable or better) in English
Application deadline	• 1 March for the following summer semester • 1 September for the following winter semester
Submit application to	Online via https://oas.cs.uni-saarland.de/

Services

Possibility of finding part-time employment	Many research groups offer student assistant positions to gain additional practical experience during the regular course programme. Weekly hours are agreed between the student and research group, and can be up to 16 hours per week.
Career advisory service	Both departments (Physics and Systems Engineering) offer personal advice for planning the study programme as well as career advice.
Support for international students and doctoral candidates	• Buddy programme • Help with finding accommodation • Support with registration procedures • Visa matters

Contact

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Course website: https://www.uni-saarland.de/en/department/systems-engineering/studium/studiengaenge/quantum-engineering/masters-program.html

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