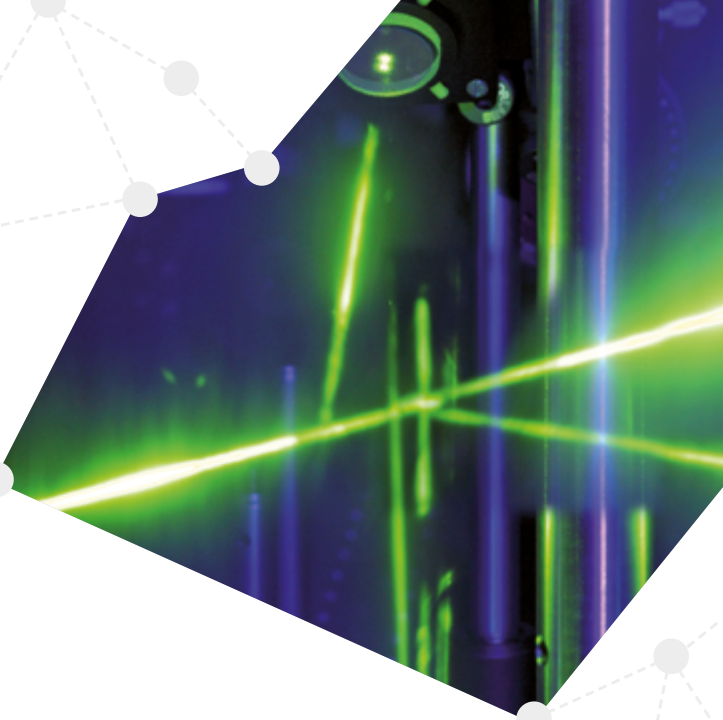
PADERBORN UNIVERSITY



MASTER PROGRAM

OPTOELECTRONICS AND PHOTONICS

PADERBORN UNIVERSITY

OPTOELECTRONICS AND PHOTONICS

The interplay between optics and electronics is of both fundamental scientific interest and the foundation of a broad range of modern technology. Remarkable progress has been made in recent years combining techniques from areas as diverse as nanophotonics, semiconductor physics and even quantum optics. Learning how to bring fundamental principles of optoelectronic interaction out of the laboratory and engineer them into workable devices is a key skillset to drive this field forward.

Our two-year Masters course in Optoelectronics and Photonics places students squarely at the intersection of modern physics, precision engineering and state-of-the-art technology. Students will develop a broad, technical skillset, as well as rigorous understanding of the underlying concepts. On completion, successful students will be ideally suited to a future academic or industrial career in this exciting and fast-moving field.

WE OFFER:

- A broad range of targeted interdisciplinary courses, taught exclusively in English
- Masters projects in internationally active research groups
- Smooth progression towards PhD study in Germany and beyond
- Career perspectives in existing and emerging industries
- A gateway to European academic and industrial networks

COURSE CONTENT AT A GLANCE

The course comprises lecture courses, laboratory practicals and an extended Masters thesis project. Key concepts are covered in core lectures, followed by specialist options in physics and electrical engineering. Laboratory work develops the practical skills required for a successful Masters thesis, which focusses on developing specialist research methods and independent project management. Language courses and professional training complete the curriculum.

EXAMPLES OF SPECIALIST SKILLS ACQUIRED:

- Characterising nanostructures
- Developing concepts and devices in quantum information technology
- Designing optoelectronic structures
- Simulating light in complex optical systems
- Training in commercial simulation packages
- Fabricating atomically flat semiconductor structures
- Circuit and system design

COURSE PROGRAMME

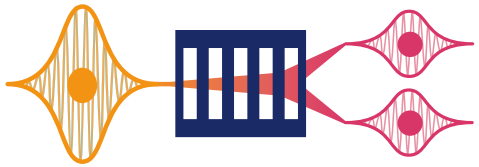
Semester	Fundamentals	Core Subjects I	Lab Courses	General Studies
1	• Circuit and System Design • Modeling and Simulations	• Computational Optoelectronics and Photonics • Optoelectronic Semiconductor Devices	• Optoelectronics • Optics and Lasers • Material Science • Computational Optoelectronics • and more	• Management of Technical Projects • Language Course • and more
2	**Core Subjects II** • Fields and Waves • Quantum Electronics	**Specialization I** • Optical Communication A • Nonlinear Optics • and more		
3	**Specialization II** • Quantum Optics • Photonic Nanostructures • and more	**Seminar** • Topics in Optoelectronics and Photonics	**Lab Project** Extended lab work with focus on a specific subject	
4	**Master Thesis** Independent research project on, e.g., quantum optics, nanooptics and spectroscopy, computational photonics, optical communications, ultrafast optoelctronics			

ENTRY REQUIREMENTS

- Bachelors' Degree in Physics or Engineering
- English language skills (no knowledge of German required)

KEY DATA

- 2-year (full-time) Masters programme
- Specialisation in optoelectronics and photonics
- Programme language: English
- No tuition fees
- Application deadline: 30th April
- Start date: October



CAREER PERSPECTIVES

Being more practical than a purely scientific masters course, yet retaining much of the academic rigour, successful graduates of the programme will be well prepared, and highly sought-after, in the job market. As well as existing technical industrial sectors, such as R&D, process engineering, technical computing and many others, the programme opens up perspectives in emerging sectors such as quantum technology, which is already attracting bright, well-trained graduates for the next generation of tech start-ups.

Graduates who wish to continue their studies after the Masters programme are perfectly placed to do so. Paderborn University is well-established as a centre of optoelectronics and photonics research, and progression to study for a PhD within one of the many exciting and internationally active research groups is extremely smooth.

PADERBORN CITY

Paderborn is a dynamic city of almost 150,000 inhabitants that charms visitors with its friendly green environment. Unique is its combination of tradition and modernity: high-tech companies stand alongside medieval churches. The world's largest computer museum and the seat of Charlemagne from 777 A.D. are both located in this peaceful town. Paderborn is built around its cathedral and park, which contains multiple bubbling sources of the Pader, Germany's shortest river.

The quality of life is very high in Paderborn. There are ample opportunities for outdoor and indoor sports, many parks and lakes, and traditional as well as modern festivals and events. 22,000 students ensure the city has a lively cultural scene. In comparison to many other German cities, Paderborn remains affordable and has sufficient student and guest housing. Paderborn has big-city facilities, but on a small-town scale that is personal and inviting.

Paderborn is one of the few cities in Germany with a young and growing demographic. It has excellent schools, a strong start-up culture and is home to global high-tech companies, including many family-run businesses in the engineering, furniture, steel, automative, electrical appliances, IT, health care, textile, and food industries. Among the most renowned businesses in Paderborn and surroundings are Phoenix Contact, Atos, Miele, Wincor Nixdorf, Benteler, Hella, dSPACE, Claas, Schüco, and Stute. Many a student has found employment in these firms after an internship or research project.

10 GOOD REASONS FOR PADERBORN UNIVERSITY

1. **Professional** – We are not only interested in ensuring you successfully complete your degree. Finding a good job is just as important. Our network with firms and businesses in the region and beyond will provide you with opportunities during and after your studies.

2. **Affordable** – There are no tuition fees in Germany, not even for international students. It's a state-funded system that offers a very good standard of higher education. Although a degree is easy on your finances, it is not easy on your brain: you will need to study hard!

3. **Compact** – A campus university means that you will find everything you need (library, housing, cafeteria, shopping, entertainment) within walking distance.

4. **Safe** – No one gets lost in Paderborn: this is a safe and tolerant city. Most people can converse in English and are happy to help you. You do not need to worry about walking home alone.

5. **Supportive** – You're given plenty of personalized support, starting with your application here. Every student's situation is unique and we try to find answers for everyone.

6. **Personal** – You are never an anonymous student here. There are counselors in the faculties and in the International Office who are on hand to help you in any way you need. Additionally, international student organizations provide study support as well as social events.

7. **Communicative** – International students are invited to attend our special German-language courses before they commence their studies. For our English-language Master degree programs you do not need to speak German, but a little knowledge of the language will help make your stay here more comfortable.

8. **Comfortable** – Paderborn offers high-quality student housing at reasonable prices. The International Office supports you in finding a place to live that meets your needs.

9. **Practical** – The companies located in and around Paderborn offer numerous opportunities for internships as well as practical subjects for a thesis. We will help you gain your first job experience during your studies.

10. **Fair** – All students have equal opportunities at Paderborn University. There is also very little hierarchy between students and professors. Students are expected to be independent and to manage their own course of study. You will easily receive the support you need if you come prepared and motivated.

Contact

Paderborn University
Faculty of Science
Warburger Str. 100
33098 Paderborn
Germany

info@photonics.upb.de

http://photonics.upb.de