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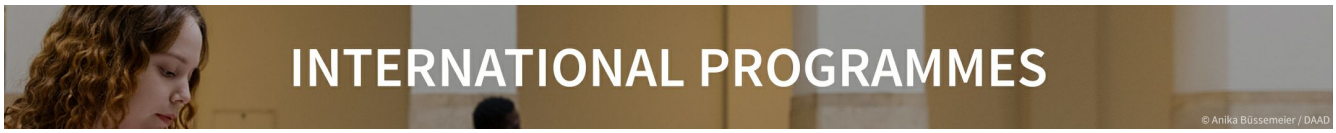

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Master's degree

MSc Medical Photonics

Friedrich Schiller University Jena • Jena

Overview

Degree	Master of Science Medical Photonics
Teaching language	• English
Languages	All courses are held in English. Participants are expected to write protocols, exams and the Master's thesis in English.
Programme duration	4 semesters
Beginning	Winter semester
Application deadline	1 April to 15 July 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	Understanding the cause of diseases, facilitating an early diagnosis, and providing a specific effective treatment are the goals of modern medicine. Light plays a key role in turning this ambitious vision into reality. In biomedical research, modern optical and photonic techniques allow for monitoring and manipulating life processes in cells and tissues on a molecular level. But also in clinical practice, optical and photonic techniques are well established in many fields of medicine, like in ophthalmology, endoscopy or biomedical imaging. To meet the demand for scientists trained in the interdisciplinary field of medical photonics, the Faculties of Medicine, Chemistry and Earth Sciences, and Physics and Astronomy of the Friedrich Schiller University Jena decided to conjointly establish the MSc Medical Photonics programme. It conveys basic and advanced insights into the quickly developing field of medical photonics. It is targeted at students holding a Bachelor of Science degree in physics, chemistry, biochemistry, and biology, but also at medical doctors and students of medicine. It provides students of these disciplines with the necessary training in the neighbouring disciplines and offers a comprehensive cross-disciplinary study programme. The aim of the programme is to provide all students with the necessary knowledge and practical skills to use and develop optical/photonic tools for biomedical research and clinical applications. Although the interdisciplinary training of students in medicine, life sciences, physics, and chemistry is a central goal of this programme, it is at the same time a big challenge. Since students with different knowledge and skills have to be taught, adjustment modules offered in the first year of the programme aim at complementing the students' knowledge in the neighbouring disciplines.

Additional modules give all students training in fundamental techniques, such as programming, statistics, and image processing. Elective courses in the second and third semesters allow the student to focus on topics in which they are interested and to gather all the skills to work on the Master's thesis, which will be concluded in the fourth semester. You can find more details on the programme website.

Assistance and advice are offered at all stages to students of the MSc Medical Photonics programme. Help to prepare the stay in Jena is given by the International Office. Counselling during the programme is provided by the coordinator and the lecturers.

In addition, several courses aimed at improving the personal and scientific skills are offered to students, including training in presentation skills, scientific writing and good scientific practice.

Course Details

Course organisation

The curriculum has a modular structure. Credit points are granted according to the European Credit Transfer System (ECTS) for every successfully completed module. The individual modules are grouped into five "blocks".

Modules of the "**Adjustment**" block offered in the first and second semester of the Master's programme aim at complementing the student's knowledge in the neighbouring disciplines. Modules in this block impart knowledge in mathematics, physics, physical chemistry, spectroscopy, and human biology.

Additional modules within the "**Fundamentals**" block give the students training in basic skills such as programming, statistics and image processing. These skills are fundamental to all of the other modules. Modules of this block also give an introduction to biomedical imaging techniques.

Elective courses can be selected in the second and third semester. Modules within the "**Specialisation**" block allow students to focus in more depth on special topics of Medical Photonics, such as microscopy (biological microscopy, single-molecule microscopy, electron microscopy, nano-optics, labels for biological specimens), spectroscopy, and diagnostics (microspectroscopy, chemometrics, optical sensors, microfluidics, mass spectroscopy) as well as clinical applications (ophthalmology, medical diagnosis and therapy, theranostics, biomaterials) and important tools in Medical Photonics (lasers, optical fibres). Furthermore, students interested in mathematics and informatics will have the possibility to enhance their skills in additional modules (e.g., advanced mathematics, image understanding, visual recognition and analysis, management of scientific data).

Lectures and seminars are accompanied by**practical courses**. In the first and second semesters, a practical lab course allows students to put the theory into practice. During this course, students can carry out experiments in set-ups located in the departments of physics, physical chemistry, and physiology. During the third semester, a research-oriented practical course provides the possibility to participate in a current research project of one of the research groups participating in the Master's degree programme and introduces the student to the topic of his/her Master's thesis, which will be concluded in the fourth semester (a detailed description of the course organisation can be found here).

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A Diploma supplement will be issued

Yes

Integrated internships

A research internship is supposed to be completed during the third semester. It gives students the possibility to apply the knowledge and skills acquired during the first two semesters of the Master's programme to a specific research project by working in a research laboratory of their choice.

Depending on the students' interests and the approval of the examination board, the research internship and the practical work for the Master's thesis can also be realised in one of the research-oriented companies in Jena.

Course-specific, integrated German language courses	No
Course-specific, integrated English language courses	No

Costs / Funding

Tuition fees per semester in EUR	None
Semester contribution	The semester fee amounts to approx. 250 EUR per semester (student services and student self-government). For details, see: Semester fee (uni-jena.de)
Costs of living	Students need approximately 700–900 EUR per month for rent, food, health insurance, books and personal items. For details, see: https://www.uni-jena.de/en/Jena+living+international.
Funding opportunities within the university	No

Requirements / Registration

Academic admission requirements	Applicants must have a Bachelor of Science degree or a comparable academic qualification in chemistry, physics, biology, biochemistry/molecular biology, or closely related fields. Students of human medicine must have concluded their studies with a state exam. In order to gain admission, the Bachelor's degree should have been concluded with the grade "good" (equal to at least 2.5 in the German grading system). See the programme website for details.
Language requirements	Although applicants are not required to provide proof of their English skills, proficiency in English language is required as all modules are taught in English only.
Application deadline	1 April to 15 July for the following winter semester
Submit application to	Please find all information regarding the application requirements here: https://www.uni-jena.de/en/msc-medical-photonics and here: https://www.uni-jena.de/en/masters-application

Services

Possibility of finding part-time employment	Although students should dedicate most of their time to the MSc programme, it is in principle possible to find part-time employment. Students from the European Union, Iceland, Liechtenstein, Norway, and Switzerland have unrestricted access to the German labour market. Students may work as student assistants besides their studies up to a certain extent. Please also see: https://www.uni-jena.de/en/Jena+living+international

Accommodation	Accommodation in student residences is available to a certain extent. Please apply to the "Studierendenwerk Thüringen". For further information, please visit our website at: http://www.stw-thueringen.de/en/housing/. You can also look for single or shared private accommodation yourself. In the buildings of the university, there are numerous information boards with accommodation offers. Note, however, that the availability of private accommodation in Jena is rather limited.
Career advisory service	The university hosts a Career and Welcome Point:https://www.cwp.uni-jena.de/en
Support for international students and doctoral candidates	• Welcome event • Buddy programme • Tutors • Cultural and linguistic preparation

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