Deutscher Akademischer Austauschdienst
German Academic Exchange Service

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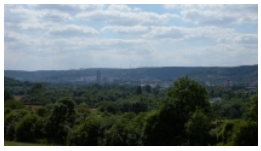
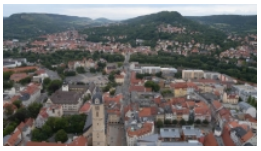
MSc Medical Photonics • Friedrich Schiller University Jena • Jena 2

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). » PDF Download
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	Semester fee (student services and student self-government) including semester ticket for free use of public transport: 245.60 EUR per semester and a one-off fee of 20 EUR for a multifunctional student ID card ("Thoska") [as of May 2023, subject to change]
Costs of living	Students need approximately 700-900 EUR per month for rent, food, health insurance, books and personal items. Please also 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

Jena – A Students' Paradise

The video offers some impressions of the Friedrich Schiller University and Jena itself.

» more: http://tinyurl.com/poo956v

Friedrich Schiller University Jena

History of the University
The Friedrich Schiller University Jena has a long history. It was founded as an academic school by Prince-Elector Johann Friedrich the Magnanimous of Saxony in 1548. It was raised to the status of a university by Emperor Ferdinand I in 1557 and opened as such in 1558. Instead of an outline of the university's history, here are some facts:

- In 1663, Gottfried Wilhelm Leibniz was a student of the scientist Erhard Weigel in Jena.
- Friedrich Schiller was a professor of history at Friedrich Schiller University Jena between 1789 and 1799.
- At the same time Johann Wolfgang von Goethe, then State Minister of Saxe-Weimar, supported Friedrich Schiller University Jena extraordinarily. He spent a lot of time in Jena.

- Jena was the centre of classical German philosophy, hosting among others: Johann Gottlob Fichte (1794-1799), Friedrich-Wilhelm Joseph Schelling (from 1798), Georg Wilhelm Friedrich Hegel (1805-1807).
- Numerous renowned German poets, writers and dramatists studied at Friedrich Schiller University Jena (Johann Christian Günther, Friedrich Gottlob Klopstock, Matthias Claudius, Friedrich Hölderlin, Novalis, Julius Mosen, Clemens Brentano, Gerhard Hauptmann, Kurt Tucholsky).
- World-famous pedagogues such as Christian Gotthilf Salzmann, Friedrich Wilhelm August Fröbel, Peter Petersen (Jenaplanschule) studied or taught in Jena.
- Johann Wolfgang Doebereiner (Professor of Chemistry, 1810-1849) was the first to organise the chemical elements by means of "triads".
- Ernst Haeckel (Professor of Zoology, 1834-1909) was the most distinguished representative of evolution theory in Germany.
- The physicist Hans Busch (Professor of Applied Physics, 1922-1947) worked on electron optics and developed the basic principles of electron microscopy.
- The Jena psychiatrist and neurologist Hans Berger (professor, 1906-1938) developed the diagnostic method of electroencephalography (EEG).
- The optician and mechanic Carl Zeiss, the physicist Ernst Abbe and the glass chemist Otto Schott formed an impressive collaboration at the end of the 19th century, a unique example of cooperation between science and industry that has been shaping the profile of scientific research at Friedrich Schiller University Jena to this day.

Today the Friedrich Schiller Friedrich Schiller University Jena is a university on the move. With about 18,000 enrolled students, it is one of Germany's fastest growing universities. Despite the fact that the number of students has quadrupled since 1989, the university is not overcrowded. More than 2,000 lecturers and researchers ensure quality teaching and training commensurate with a classic university. In addition, more than 1,300 scientists and technical staff work on research projects financed by outside sponsors.

FRIEDRICH-SCHILLER-
UNIVERSITÄT
JENA

University location

The city of Jena
The city of Jena is brought to life by its fascinating combination of an intellectual history, a delightful countryside, an innovative international research and industry, and a youthful student lifestyle. This rich variety creates a unique backdrop which lends this small, lively city its special charm. Watch the video at: http://tinyurl.com/poo956v

Jena's academic and intellectual development
Jena has been one of the most famous places to study in Germany since the founding of its university, the "Alma Mater Jenensis", in 1558. At the end of the 18th century, thanks to its close connection to the nearby royal seat at Weimar and support by the poet and minister, Goethe, the city on the Saale went through its classical period, during which it developed into the most important intellectual centre in Germany.

Jena's economic development
In the second half of the 19th century, Jena developed into an industrial city, thanks to the work of the three scientific and economic giants, Carl Zeiss, Otto Schott, and Ernst Abbe. Their cooperation led to the creation of the world-famous Zeiss Works and the "Schott und Genossen" glass factory. This effective cooperation between research institutes and economic enterprises has proven its value all the way up to the present day and justifies Jena's exceptional reputation as a high-technology location.

Jena's modern cultural scene
In addition to museums of technology, science, literature, and art history, there is also an attractive modern cultural scene in Jena. For example, the annual open-air festival "Kulturarena" attracts international stars to Jena. Furthermore, there are plenty of individual, top-class events among the wide range of performances at Jena Theatre (Theaterhaus), Jena Art Society (Kunstverein), and Jena Philharmonic Orchestra.

Jena's countryside
The traditional, innovative city lies at the middle reaches of the River Saale. The Saale valley in Jena is shaped by a host of monuments to its cultural history and has connections with many great names from the past. Along with its many sights, the city, nestled in an almost Mediterranean landscape with limestone hills up to 400 metres high, offers a variety of bicycle paths and charming surroundings for walking and all other sporting activities, such as triathlons, dragon boating, cycling, track, marathons, martial arts, etc.

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https://www.facebook.com/UniJena/

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