

Graduation

The internationally recognized academic degree of Master of Engineering (M. Eng.) will be conferred by the Ernst-Abbe-Hochschule University of Applied Sciences Jena on students who have successfully completed the programme.

Entrance Requirements

- ▶ Bachelor degree or diploma (from a university or university of applied sciences) in a technical or scientific subject
- ▶ The passing of an aptitude test

Programme language is German. International students who apply for the full-time course have to pass the language exams DSH 2 or DSH 3 or Test DAF with 4 or 5 points in all portions. More information about entrance requirements can be found on the following site: www.master.eah-jena.de

Professional Perspectives

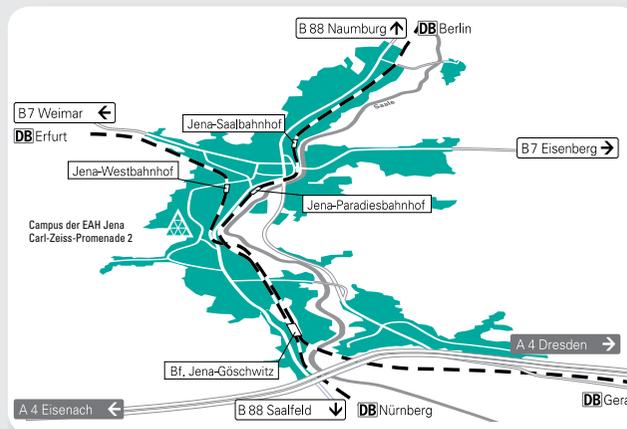
Demographic developments over recent years have led to a marked decline in the number of graduates. In its latest press releases the German Industry Association for Optical, Medical and Mechatronic Technologies (SPECTARIS) has set out the problem as follows:

“The German precision engineering and optical industry embraces high tech areas, such as laser and laboratory technology, the entire spectrum of phototechnologies and ophthalmic optics and medical engineering. Its products can be found in nearly all areas of life and will permanently change the industrial future of Germany over the coming years. The greatest problem in this sector is currently the acute shortage of skilled personnel. All in all, there is currently a shortage of over 10,000 qualified personnel in the optical technologies division of the sector alone, if all fields of activity are included. To redress this situation the association is calling in the first instance for an improvement in technical training and further training pathways.”

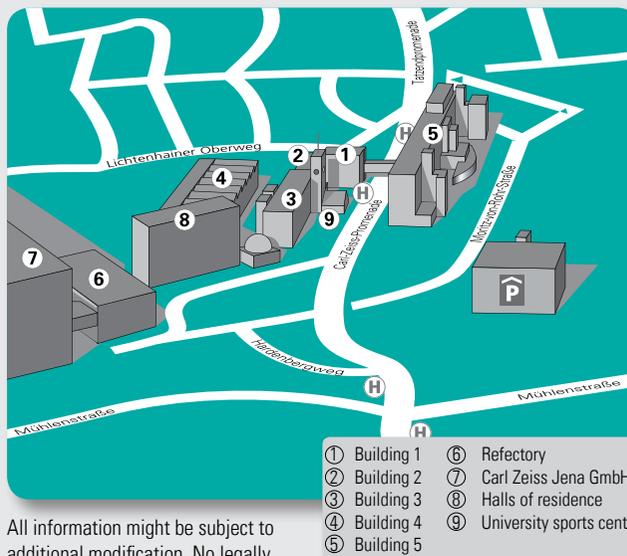
As can be seen from this assessment, the prospects of interesting and well-paid employment for graduates, particularly graduates in “Laser- and Optotechnologies”, are extremely favourable.

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| Application | www.eah-jena.de/bewerbung |
| Dean's office | Phone: +49(0)3641 205-400, Fax: +49(0)3641 205-401 Email: scitec@eah-jena.de |
| Course director/ Course consultant | Prof. Dr. Burkhard Fleck Phone: +49 (0)3641 205-354 Email: Burkhard.Fleck@eah-jena.de |

Road and rail links



Campus map



All information might be subject to additional modification. No legally binding claims can be inferred from this informational flyer.

Foundation for the Accreditation of Study Programmes in Germany
Accreditation Council
Successfully accredited by ACQUIN



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Photos: EAH-Jena, S. Reuter, J. Hauspurg

Laser- and Optotechnologies

Master's Degree Course

INNOVATION FOR QUALITY OF LIFE.
Health, Precision, Sustainability & Networking

M. Eng. Laser- and Optotechnologies

Programme Contents and Objectives

The Master's degree programme in "Laser- and Optotechnologies" is attached to the correspondent Bachelor's degree programme. Provided the relevant entry requirements are met, students can obtain the internationally recognized "Master of Engineering" degree over the standard course duration of four semesters.

This degree also provides additional opportunities for graduates, such as the opportunity to study for a PhD at a university. To ensure that the training is up to date, considerable parts of the programme are delivered or supported by research institutes and companies working in the laser and optical field. The contents of this subject-specific programme are strongly geared to optics relevant support programmes and are always adapt to the latest developments in science and technology. The course programme provides a solution to the acute shortage of skilled personnel in laser and optical field, thereby meeting the demands of the precision engineering and optical industry.

Jena, the centre of optics industry, enjoys many locational advantages to ensure the success of this Master's degree programme. For example, the competence network, "OptoNet" founded in Thuringia brings together a large number of partners located in Jena and the region from industry and research which actively support this programme.

On the one hand, collaboration with research institutes makes possible a more effective, science-oriented education and, on the other hand, the involvement of companies from the region guarantees an education whose contents are tailored to the needs of the economy. In this way, a flexible programme profile is created matched to current needs. The key programme elements are in the fields of laser technology, optics, optical technology, optical design and opto-electronics.

In Addition, the internationally recognized certificate as a Specialist for Metal Processing by Laser Beam can be acquired.



| | Module 1 | Module 2 | Module 3 | | Module 4 | | Module 5 | |
|---------------------|---------------------|-----------------|------------------------------------|-------------------------------|--------------------|-----------------------------|-----------------|-------------|
| 1st Semester | Meso Module 1a* | Meso Module 1b* | Marketing | Business Management | Quality Management | Project Management | Project I | |
| 2nd Semester | Meso Module 2a* | Meso Module 2b* | Numerical Mathematics | English for Specific Purposes | Soft Skills | Patent Law/ Patent Research | Project II | |
| 3rd Semester | Meso Module 3a* | | Meso Module 3b* | | | | Elective Module | Project III |
| 4th Semester | Research Internship | | Master Thesis including Colloquium | | | | | |

| Specialisation: | Meso Module 1 | Meso Module 2 | | Meso Module 3 | | | |
|---|------------------------------|------------------------------|-----------------------------|------------------------------|------------------------------|--------------------------------|---|
| Laser Technique | Laser Technique | Laser Measuring Technique I | Laser Material Processing I | Laser Measuring Technique II | Laser Material Processing II | Lasers in Medicine | Basics of Spectroscopy / Laser Spectroscopy |
| Optical Technology | Automation of Production | Optical Technology I | Optical Materials | Optical Technology II | | Technology of Optical Coatings | Assembly of optics |
| Optical Design | Optical Measuring Techniques | Optical Design + Optical CAD | Optical Design I | Optical Design II | | Microoptics | Ophthalmic Techniques |
| Development of Optical Instruments | Optical Devices | Development of Instruments | Optomechanical Systems | Design of Instruments | | Microoptics | Ophthalmic Techniques |
| Opto-electronics | Optical Devices | Opto-electronics I | Fibre Optics | Opto-electronics II | Spectral Sensor Technology | Optical Coordinates Metrology | Digital Projection |

* Selection of two meso modules from the five offered

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| Voluntary Elective Module in 2nd Semester | Non-Linear Optics | Nanooptics | CAD / CAM | Materials for Sensors and Electronics | Modern Production Engineering |
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| Voluntary Elective Module in 3rd Semester | Optimisation of Production Processes | Introduction to FEM | Advanced Illumination Technology |
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| Elective Module in 3rd Semester | Business Formation | Business English | Further Foreign Language |
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Employment Opportunities

There are employment opportunities for graduates of the Master's degree programme "Laser- and Optotechnologies" in fields including the optical industry, laser technology, laser design and applications, information and communication technology, optoelectronics, electronics, computer technology, medical and environmental engineering, biotechnology and sectors connected with optics.

The Master's degree qualifies graduates in particular for employment in the research and development departments of companies, research institutes and universities. In addition, it provides a very good foundation for the further qualification of a PhD. Because the Master's degree is internationally recognized, it also offers excellent prospects for a career working abroad.

Programme Overview

Enrolment takes place in winter semester. Two meso modules are to be selected from the five offered (laser technique, optical technology, optical design, development of optical instruments and opto-electronics). The meso modules selected are consolidated in the following semesters. Important interdisciplinary programme contents, such as marketing, business management, patent law, English for specific purposes, numerical mathematics, quality and project management are compulsory and make important contributions in developing leadership competences.

Practical training is ensured by a research internship that takes place during the programme. The programme ends after four semesters with the Master thesis. The Master thesis and the research internships can be carried out in companies and research institutes in the relevant sector, at home and abroad.

Details of the companies, universities and institutes who have joined together to form the Thuringian Competence Network "OptoNet" can be found by visiting www.optonet-jena.de.