

Come closer to success

in an exciting study program
at the Faculty of Technology.

Contact



We will be happy to help you!

For general questions:
Our student advisory service

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For questions about the degree program:

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Interested in this degree program?

More information is available at
» www.hs-empden-leer.de/en/sl/mep

or come and see us in Emden.
Visit the university and the laboratories,
and find out more in a personal meeting.



CLOSE TO SUCCESS.

Status: 06.2021



↳ Technology

Engineering Physics

- » Renewable Energies
- » Laser & Optics
- » Biomedical Physics
- » Acoustics

Master of Science (M.Sc.)

Careers and areas of employment

As a result of the program's well established scientific and practical aspects, graduates are very well qualified for all areas of technology-oriented industrial and research organizations. With the practical experience acquired in the course of project work, graduates are additionally qualified for management positions, where students can utilize their teamwork skills and entrepreneurial thinking. The degree opens up the opportunity to pursue a doctorate.

The study course

This master's program is offered jointly by the Carl von Ossietzky University of Oldenburg and the University of Applied Sciences Emden/Leer, and is intended to fill the gap between traditional physics and engineering. Students gain a comprehensive understanding in selected areas of physics. Additionally, the application of physics and engineering is elaborated upon in a focal area that can be chosen from "Laser and Optics", "Biomedical Physics", "Acoustics" and "Renewable Energies".

Students are qualified for employment in research and industry through an introduction to modern technologies. In the integrated research project, students gain valuable experience in a research center or in a company. Furthermore, this program is international in its orientation. More than half of the students in the international Engineering Physics Program come from abroad. Students from many continents work closely together in lectures, practice sessions, and projects. All mandatory classes are offered entirely in English. Admission to this English language program requires good English skills. This master's program in Engineering Physics is accredited by the accreditation agency ASIIN, and has been awarded the EUR-ACE® label. This ensures the international recognition of the program.

Come closer » www.hs-empden-leer.de/en



Study structure and content

The program consists of physics, engineering, and specialization. In the area of physics, in-depth modules on selected areas are taught. The specialization covers both fundamentals and state-of-the-art applications of the respective focus.

In the area of engineering sciences, students have the opportunity to familiarize yourself in detail with various modern technologies. Your studies will be rounded out by a project in a research institution or in a company, as well as a management module. The master's thesis is worth 30 credit points.

The specializations

Modern medicine employs a multitude of sophisticated, physically based techniques, both in therapy and in diagnostics. Providing a basic foundation in anatomy and physiology, the specialization **Biomedical Physics** goes on to emphasize modern methods in medical radiation applications, such as radiotherapy, nuclear medicine, or radiology, and the basics of minimal invasive therapy including micromechanical and laser assisted methods, as well as other imaging techniques such as ultrasound, nuclear magnetic resonance, and optical tomography. Also covered are well-established areas of medical engineering physics, such as medical electronics, data and image acquisition and processing, radiation biophysics, laboratory diagnostics, and biomechanics.

Training in the field of medical radiation physics is carried out in close cooperation with the Medical Centre for Radiotherapy and Nuclear Medicine at the Pius Hospital Oldenburg. Through this collaboration, students make contact with professional physicists from an early stage

of their program and are trained to use modern machines, such as linear accelerators or the latest generation computer tomography. By selecting suitable courses, it is possible to acquire the specialist recognition as a Medical Physicist of the DGMP.

The specialization **Acoustics** covers infrasound, audible sound, ultrasound, and structure-born sound and mechanical vibrations. Topics address digital signal processing, the basics of radiation and wave propagation, physical and technical properties of electro-acoustic transducers, numerical calculation of mechanical vibrations, acoustic properties of matter, and evaluation of the impact of sound and vibrations on humans. Subjective perception of sound, physics of the ear, sound design of products, sound environment of transportation means, and noise abatement are fields of research in Oldenburg.

The ubiquity and importance of sound and vibrations in engineering and science ensure that numerous career opportunities await the graduate. Vibration control and monitoring plays an important role in machine design and quality control. Modern structures with lighter and stronger materials are more prone to detrimental vibrations. Car interior sound is designed to optimize customer comfort. Ultrasound is used as a diagnostic tool in medicine, in materials testing, and for environmental monitoring.

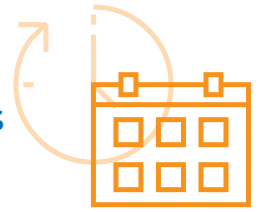
"Germany takes a leading role on the global market for laser technology and optics" (Bundesministerium für Bildung und Forschung). In the specialization **Laser and Optics**, the focus of study is on the physical basics of lasers as well as the applications in optical communication (fiber optics), material processing on macro-, micro- and nanoscale (from cruise ships to computer chips), medical technology, optical metrology (e.g., holography or environmental monitoring), or the development of compact lasers with high power.

The future regional, national, and global supply of primary energy will not be possible without a significant contribution of renewable energy: solar radiation and wind energy provide the largest theoretical contribution as well as the highest technically usable potential forms of renewable energy. Thus, the focus of the **Renewable Energies** specialization will be the theoretical basics of converting these energies and their respective limits, as well as the discussion of physical and technological concepts of mode of operation, limits, and applications.

Course of studies

» Theoretical Methods	6 KP
» Advanced Physics (e.g. Optics, Fluid Dynamics, Fourier Methods, Advanced Nuclear & Particle Physics, Audiologie und Akustik)	12 KP
Engineering Modules	
» Advanced Metrology	6 KP
» Seminar Advanced Topics in EP	3 KP
» Elective subjects	24 KP
Specialization Modules	
» Elective subjects	24 KP
» Advanced Research Project and master's thesis	45 KP
Total	120 KP

Start of studies



Admission is for the **summer and winter semesters**.

Admission requirements

As a rule, the admission requirements for the master's degree program are a bachelor's degree, or a comparable degree in the same or in a closely related field of study.

In addition, proof of English language skills is required of at least CEFR level B2 or 8 points (grade 3.0) in upper secondary education.

More information on the admission requirements and the application for admission can be found in the admission regulations.



Information for first semester students is available at
» www.uol.de/en/students/study-entry

Current enrollment information can be found at
» www.l.uol.de/epmaen

With international university entrance qualification:
You apply online via uni-assist:
» www.uni-assist.de/en