

dated  
10/09/2019\*)  
-Reading  
version-

### 1. University degree

Once the student has passed the Bachelor's examination for the international Bachelor's degree programme in Engineering Physics, the Faculty of Mathematics and Natural Sciences of the Carl von Ossietzky University of Oldenburg and the Faculty of Technology of the University of Applied Sciences of Emden/Leer award the degree of Bachelor of Engineering (B.Eng.)

### 2. Purpose of the degree programme

- a) The international Bachelor's programme in Engineering Physics is a practical-based programme and is designed to give students a general understanding of mathematics and physics as well as a sound basic education in engineering sciences. Once students have a solid foundation in the relevant mathematical methods, they go on to learn about the fundamentals of experimental physics and elements of theoretical physics. Students further develop their basic scientific and technical knowledge in the later semesters and further expand that knowledge by specialising in one of the following fields: Biomedical Physics & Acoustics, Laser & Optics and Renewable Energies. Students develop their practical skills during practicals, which become increasingly challenging as they progress through the degree programme. Students develop other key skills, such as teamwork, communication and presentation skills, during the lab projects in the later semesters. Students also develop skills and learn how to use them effectively during a practical phase, and they also learn the essential techniques required for further independent scientific education.
- b) Holders of this Bachelor's degree are well prepared to take on professional roles in production monitoring and physical data logging, as well as organisation and verification roles at research institutes, in industry, clinics and government organisations.
- c) Students who successfully complete this Bachelor's degree are also eligible to follow a two-year Master's degree programme in Engineering Physics or related subjects.

### 3. General information about the degree programme

- a) Admission to the module examination may require regular, active and documented participation in practice-oriented teaching components (internships, exercises, seminars) (Section 9.4 of the Bachelor's Examination Regulations (BER)). Bonus points may be awarded for performances in such teaching components and taken into account when grading the module (Section 11.4 of the BER). It must be possible to achieve a grade of 1.0 without a bonus. More information can be found in the module descriptions. In the event of conflicts, an ombudsperson must be consulted.
- b) All mandatory modules are held in English.

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\*) There may be interim provisions for this version of the regulations, which may also affect you during the course of your degree programme. For more information, please read the official version of the regulations/amendments (Section II) in the official notices at: <https://www.uni-oldenburg.de/amtliche-mitteilungen/>

c)

#### 4. Structure of the degree programme

The degree programme consists of

- a core curriculum with a total student workload of 120 credit points, of which 33 credit points are for core modules,
- specialisation modules with a total student workload of 45 credit points, of which 15 credit points are for the training module and
- the Bachelor's thesis module with a total student workload of 15 credit points.

#### 5. Regulations for examination components

- a) The nature and scope of the examination components must correspond to the number of credit points for that particular module. As a rule, for module examinations with student loads of 6 credit points, written examinations should not last longer than three hours, and oral examinations should not last longer than 30 minutes.
- b) The examinations can be conducted in either German or English. Examinations may be conducted in other languages on request, provided the student and examiner approve.
- c) It is not possible to resit a passed examination to improve marks (free attempt according to Section 15.5 of the BER) if the examination comprises practical exercises.

#### 6. Structure and content of the modules in Engineering Physics

##### Core modules (33 credit points), compulsory modules

Module name	Teaching format	Credit points	Examination components
phy540 Mathematical Methods for Physics and Engineering I	1 L, 1 E	9	<u>1 examination:</u> 1 Written examination (90 - 180 mins) or 1 Oral examination (30 - 45 mins)
phy509 Mechanics	1 L, 1 E	6	<u>1 examination:</u> 1 Written examination (90 - 180 mins) or 1 Oral examination (30 - 45 mins)
phy513 Basic Laboratory	2 Internships	9	<u>2 practical exercises:</u> (Winter semester: 13 Reports (5 - 20 pages), 1 presentation (10 - 20 mins); Weighting: 5/9) (Summer semester: 11 Reports (5 - 20 pages), 1 presentation (10 - 20 mins); Weighting: 4/9)

phy520 Electrodynamics and Optics	1 L, 1 E	9	<u>2 examinations:</u> Written examinations (90 - 180 mins in total) or oral examinations (30 - 45 mins in total) (Weighting: 2/3 for the Electrodynamics partial module & 1/3 for the Optics partial module)
<b>Total</b>		<b>33</b>	

Abbreviations: Lecture (L), Exercises (E)

**Advanced modules (87 credit points), compulsory modules**

<b>Module name</b>	<b>Teaching format</b>	<b>Credit points</b>	<b>Examination components</b>
phy555 Basic Engineering	2 L	6	<u>2 examinations:</u> Written examinations (90 - 180 mins in total) or oral examinations (30 - 45 mins in total)
phy563 Specialization	2 L	6	<u>1 examination:</u> 1 Written examination (30 - 60 mins) or 1 Oral examination ( 15 - 30 mins) or 1 Presentation (15 - 30 mins) 1 Term paper (5 - 15 pages)
phy541 Mathematical Methods for Physics and Engineering II	1 L, 1 E	6	<u>1 examination:</u> 1 Written examination (90 - 180 mins) or 1 Oral examination (30 - 45 mins)
phy570 Electronics	2 L	6	<u>1 examination:</u> 1 Written examination (90 - 180 mins) or 1 Oral examination (30 - 45 mins)
phy542 Mathematical Methods for Physics and Engineering III	1 L, 1 E	6	<u>1 examination:</u> 1 Written examination (90 - 180 mins) or 1 Oral examination (30 - 45 mins)
phy031 Atomic and Molecular Physics	1 L, 1 E	6	<u>1 examination:</u> 1 Oral examination (30 - 45 mins) or 1 Written examination (90 - 180 mins)
phy551 Quantum Structure of Matter	1 L	6	<u>1 examination:</u> 1 Written examination (90 - 180 mins) or 1 Oral examination (30 - 45 mins)

phy505 Lab Project I	1 L Internship	9	<u>2 examinations:</u> 1 Term paper (10 - 15 pages) (Weighting 1/3) and 1 Internship report (15 - 30 pages) with final presentation (20 - 30 mins) (Weighting 2/3)
phy501 Numerical Methods	1 L, 1 E	6	Practical exercise
phy041 Thermodynamics and Statistics	1 L, 1 E	6	<u>1 examination:</u> 1 Written examination (90 - 180 mins) or 1 Oral examination (30 - 45 mins)
<b>Module name</b>	<b>Teaching format</b>	<b>Credit points</b>	<b>Examination components</b>
phy533 Metrology	1 L/E + 1 S	6	<u>2 examinations:</u> 1 Written examination (60 - 90 mins) or 1 Oral examination (20 - 30 mins) (50%) and 1 Short presentation or 1 Term paper (10 - 15 pages) (50%)
phy581 Material Science	1 L, 1 E	6	<u>1 examination:</u> 1 Written examination (90 - 180 mins) or 1 Oral examination (30 - 45 mins)
phy590 Control Systems	1 L, 1 E	6	<u>1 examination:</u> 1 Oral examination (30 - 45 mins)
phy502 Solid State Physics	1 L, 1 E	6	<u>1 examination:</u> 1 Written examination (90 - 180 mins) or 1 Oral examination (30 - 45 mins)
<b>Total</b>		<b>87</b>	

## 7. Specialisation section

(1) The specialisation section comprises

- a training module (with a student workload of 15 credit points in accordance with Section 8),
- additional modules (with a student workload of 30 credit points in accordance with Section 7.2).

2) Students are free to select specialisation modules offered by the Institute of Physics and interdisciplinary specialisation modules offered by the University of Oldenburg and the Faculty of Technology at the University of Applied Sciences Emden/Leer. Students are urgently recommended to complete the following:

- Subject-related specialisation modules, with a student workload of at least 12 credit points. These modules can be used to familiarise students with the specific topic on which they are going to write their Bachelor's thesis, to learn the necessary language skills or to deepen their practical knowledge with a

view to a subsequent Master's programme and to supplement their knowledge. Students must choose at least one specialisation worth a total of 6 credit points, as this provides the basic subject-related knowledge required for the Bachelor's thesis module.

- Furthermore, students can also take modules to improve their practical skills and acquire the necessary language skills for modules in subsequent semesters. The latter are strongly recommended for students with insufficient language skills.

## 8. The training module

During the degree programme, students must complete a two-month professional internship (with a student workload of 15 credit points) at a company or research institution. This internship usually takes place at the end of the 5th semester. The University of Oldenburg and the University of Applied Sciences Emden/Leer help students find internships through the relevant institutions. Students must choose a lecturer who is entitled to set and assess examinations to supervise the professional internship.

Module name	Course units	Credit points	Examination components
prx108 Professional internship	1 I, 1 Poster session	15	1 Portfolio (Report and short presentation)

Abbreviation: Internship (I)

## 9. Semester abroad

Both German and international students are encouraged to spend a semester abroad. As far as is possible, the semester abroad is organised as part of an exchange programme.

## 10. Examining Board, Examination Office

The Engineering Physics Joint Committee is entrusted by Faculty V of the University of Oldenburg and the Faculty of Technology of the University of Applied Sciences Emden/Leer with the task of appointing an Examining Board in accordance with the examination regulations. The Examining Board consists of six members with voting rights, namely two professors or university lecturers from the University of Oldenburg, two professors or university lecturers from the University of Applied Sciences Emden/Leer, a staff member active in teaching, and a student following the degree programme.

## 11. Examiners

Employees and members of the University of Oldenburg, the University of Applied Sciences Emden/Leer or another university, who are qualified to teach the relevant examination subject or sub-area of the examination subject, are appointed to perform assessments and set examinations.

## 12. Bachelor's thesis

The Bachelor's thesis module has a student workload of 15 credit points and comprises the Bachelor's thesis and the final colloquium. Twelve credit points are available for writing the Bachelor's thesis and three for the final colloquium (Weighting: 4/5 Bachelor's thesis, 1/5 colloquium).

The topic of the Bachelor's thesis may be set by any professor or lecturer at the Faculty of Mathematics and Natural Sciences of the Carl von Ossietzky University of Oldenburg or at the Faculty of Technology of the University of Applied Sciences Emden/Leer who is involved in teaching the Bachelor's programme in Engineering Physics. The Bachelor's thesis can be written in either German or English.