

Appendix 6 Degree-specific appendix - Engineering Physics

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version-

Supplement to Section 1 Scope of application

These Master's examination regulations apply to the Master's degree programme in Engineering Physics offered by 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 Emden/Leer.

Supplement to Section 2 Learning outcomes

The Master's degree in Engineering Physics qualifies students for PhD programmes in the fields of physics and engineering sciences. More information can be found in the PhD regulations.

Supplement to Section 3 University degree

Once the student has passed the Master's examination for the international Master'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 Emden/Leer award the degree of Master of Science (MSc).

Supplement to Section 5 Duration, scope and structure of the academic programme, part-time study

On 4: The Master's degree programme comprises compulsory modules (with a student workload of 36 credit points), elective modules (with a student workload of 54 credit points) and the Master's thesis module (with a student workload of 30 credit points). The modules are taught in either German or English.

On 5: It is possible to specialise in the following areas: Biomedical Physics, Acoustics, Laser & Optics or Renewable Energies. A specialization is listed on the academic transcript if at least 12 credit points were obtained from modules from the Engineering Science programme in this specialisation and at least 18 credit points were obtained from modules in this specialisation area. The student must have passed all modules.

On 7: Students in the European Wind Energy Master programme must complete modules according to §10(b).

*) 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/>

Supplement to Section 6 Examining Board, Examination Office

On 1: The Examining Board is appointed by the “Engineering Physics Joint Committee” of the Carl von Ossietzky University of Oldenburg and the University of Applied Sciences Emden/Leer, and is approved by 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 Emden/Leer.

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.

Supplement to Section 7 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.

Supplement to Section 9 Admission to modules and module examinations

Modules can be taken by students enrolled in the Engineering Physics Master's programme at the Carl von Ossietzky University of Oldenburg or at the University of Applied Sciences Emden/Leer as long as the grounds for exclusion in Section 20.3.3 do not apply.

Module, requiring “active participation”, can only be approved as passed if the requested amount of participation was documented. “Active participation” is considered to be regular, active and well documented participation in practical meetings (practical courses, exercises, seminars, excursions) and in practical parts of lectures. This includes the solving of exercises, documentation of the done experiments, discussions during seminars, or the documentation and presentation of the lecture’s contents. The efforts of the “active participation” are not graded. In the case of conflict an ombudperson is to be asked.

Supplement to Section 10 Structure and content of the modules

- a) Students must complete the following compulsory modules (with a student workload of 36 credit points):

Module name	Module type	Credit points	Teaching format	Examination components
phy631 Advanced Metrology	Compulsory	6	L or I or S	1 Examination
phy640 Seminar Advanced Topics in EP	Compulsory	3	S	1 Examination and active participation of the seminar
phy611 Theoretical Methods	Compulsory	6	L and E	1 Examination
phy681 Tools and Skills in Engineering Sciences	Compulsory	6	L, E, S, I	1 Examination
phy691 Advanced Research Project (Preparation for the Master’s Thesis)	Compulsory	15	Practical work	1 Examination
Total		36		

L = Lecture(s), E = Exercise(s), I = Internship, S = Seminar(s)

The following elective modules are offered in the Master's degree programme: Students must obtain 12 credit points for elective modules listed under “Advanced Physics”.

1. Advanced Physics

Module name	Module type	Credit points	Teaching format	Examination components
phy600 Photonics	Elective	6	1 L	1 Examination
phy601 General Theory of Relativity	Elective	6	1 L	1 Examination
phy602 High-Energy Radiation Physics & Space Environment	Elective	6	2 L	1 Examination
phy603 Fluid Dynamics	Elective	6	2 L	1 Examination
phy604 Cosmology & Accretion Disks	Elective	6	2 L	1 Examination
phy605 Digital Signal Processing	Elective	6	1 L	1 Examination
phy606 Physics with Ultrashort Pulses and Fourier Methods	Elective	6	2 L	2 partial Examinations
phy679 Acoustics	Elective	6	1 L	1 Examination
phy632 Spectrophysics	Elective	6	1 L	1 Examination
phy633 Optics	Elective	6	1 L	1 Examination
phy607 Selected Topics in Advanced Physics	Elective	6	2 L	1 Examination or 2 partial examinations

2. Specialisation: Biomedical Physics

2.1. Engineering Science

Students must obtain at least 12 credit points from the following modules.

Module name	Module type	Credit points	Teaching format	Examination components
bio279 Foundations of Physiology	Elective	6	1 L	1 Examination
phy697 Information Processing and Communication	Elective	6	1 L	1 Examination
phy695 Specialisation course: Radiation Protection	Elective	6	1 L	1 Examination
phy696 Advanced Topics Speech and Audio Processing	Elective	6	1 L	1 Examination

phy685 Advanced Engineering Topics in Biomedical Physics & Acoustics	Elective	6	L, E, I, S	1 Examination or 2 partial examination
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2.2. Specialisation

Students must obtain at least 18 credit points from the following modules.

Module name	Module type	Credit points	Teaching format	Examination components
phy732 Psychophysics and Audiology	Elective	6	1 L, E, S	1 Examination
phy698 Selected Topics on Medical Radiation Physics & Medical Radiation Physics	Elective	6	2 L	1 Examination
phy678 Processing and Analysis of Biomedical Data	Elective	6	1 L	1 Examination
phy635 Imaging Techniques/ Optical Measuring Techniques	Elective	6	2 L	2 partial Examinations
phy686 Advanced Topics in Biomedical Physics & Acoustics	Elective	6	L, E, I, S	1 Examination or 2 partial examination

3. Specialisation: Acoustics

3.1. Engineering Science

Students must obtain at least 12 credit points from the following modules.

Module name	Module type	Credit points	Teaching format	Examination components
phy730 Machine Learning	Elective	6	1 L	1 Examination
phy694 Machine Learning II	Elective	6	1 L	1 Examination
phy677 Speech Processing	Elective	6	1 L	1 Examination
phy685 Advanced Engineering Topics in Biomedical Physics & Acoustics	Elective	6	2 L	1 Examination or 2 partial examination

3.2. Specialisation

Students must obtain at least 18 credit points from the following modules.

Module name	Module type	Credit points	Teaching format	Examination components
phy732 Psychophysics and Audiography	Elective	6	1 L	1 Examination
phy678	Elective	6	1 L	1 Examination

Processing and Analysis of Biomedical Data				
phy686 Advanced Topics in Biomedical Physics & Acoustics	Elective	6	2 L	1 Examination or 2 partial examination
phy696 Advanced Topics Speech and Audio Processing	Elective	6	1 L	1 Examination

4. Specialisation: Laser and Optics

4.1. Engineering Sciences

Students must obtain at least 12 credit points from the following modules.

Module name	Module type	Credit points	Teaching format	Examination components
phy632 Spectrophysics	Compulsory	6	1 L	1 Examination
phy633 Optics	Compulsory	6	1 L	1 Examination
inf308 Micro-robotics II	Elective	6	1 L, 1 E	1 Examination
phy608 Medical Optics	Elective	6	1 L, 1 S	1 Examination
phy682 Advanced Engineering Topics in Laser and Optics	Elective	6	2 L	1 Examination or 2 partial examination

4.2. Specialisation

Students must obtain at least 18 credit points from the following modules.

Module name	Module type	Credit points	Teaching format	Examination components
phy637 Laser Design and Beam Guiding	Elective	6	1 L	1 Examination
phy638 Laser Material processing	Elective	6	1 L	1 Examination
phy634 Biophotonics and Spectroscopy	Elective	6	1 L, 1 S	1 Examination
phy639 Physics with Ultrashort Pulses and Intense Light	Elective	6	1 L	1 Examination
phy636 Fibre Technology and Integrated Optics	Elective	6	1 L or 1 I	1 Examination
phy683 Advanced Topics in Laser and Optics	Elective	6	2 L	1 Examination or 2 partial examination

5. Specialisation: Renewable Energies

5.1. Engineering Sciences

Students must obtain at least 12 credit points from the following modules.

Module name	Module type	Credit points	Teaching format	Examination components
phy641 Energy Resources & Systems	Elective	6	2 L	1 Examination
phy642 Renewable Energy Technologies I for Engineering Physics	Elective	6	2 L	1 Examination
Phy643 Renewable Energy Technologies II for Engineering Physics	Elective	6	L, S, E, I	1 Examination
phy644 Wind Energy Physics, Data & Analysis	Elective	6	2 L	1 Examination
phy616 Computational Fluid Dynamics	Elective	6	2 L and 2 E	1 Examination
inf303 Fuzzy Control and Artificial Neural Networks in Robotics and Automation	Elective	6	1 L	1 Examination
phy605 Digital Signal Processing	Elective	6	1 L	1 Examination
phy687 Advanced Engineering Topics in Renewable Energies	Elective	6	2 L or S, I	1 Examination or 2 partial examination

5.2. Specialisation

Students must obtain at least 18 credit points from the following modules.

Module name	Module type	Credit points	Teaching format	Examination components
phy609 Photovoltaic Physics	Elective	6	1 L, E	1 Examination
phy646 Wind Physics Student's Lab	Elective	6	1 S	1 Examination
phy647 Future Power Supply Systems	Elective	6	1 L	1 Examination
phy648 Wind Resources and their Applications	Elective	6	2 L	1 Examination
phy649 Design of Wind Energy Systems	Elective	6	2 L	1 Examination
phy699 Photovoltaics Systems & Energy Meteorology	Elective	6	L, S	1 Examination and active participation in the seminar
inf511 Smart Grid Management	Elective	6	L, E	1 Examination
inf510 Energy Information Systems	Elective	6	L, S	1 Examination
phy984 Semiconducting Materials for Solar Energy	Elective	6	S	1 Examination

phy987 Control of Wind Turbines and Wind Farms	Elective	6	L, E	1 Examination
phy689 Advanced Topics in Renewable Energies	Elective	6	L, E, S, I	1 Examination or 2 partial examination

b) For students studying Wind Physics as part of the Erasmus Mundus Master's degree programme in European Wind Energy, the following modules are available:

I) Subtrack 1: „Atmospheric Physics“

Module name	Module type	Credit points	Teaching format	Examination components
phy616 Computational Fluid Dynamics	Compulsory	6	2 L and 2 E	1 Examination
phy670 Fluid Dynamics II / Wind Energy Meteorology	Compulsory	6	2 L and 1 E	1 Examination
phy673 Diffusions and Stochastic Differential Equations ¹	Compulsory	5	L and E	1 Examination
phy674 Turbulence Theory ¹	Compulsory	5	L and E	1 Examination
phy659 Introduction to Micro-Meteorology ¹	Compulsory	5	L, E, S	1 Examination
phy684 Wind Turbine Technology and Aerodynamics ¹	Compulsory	10	L, E, S	1 Examination
phy688 Planning and Development of Wind Farms ¹	Compulsory	5	L, E, S	1 Examination
phy692 Research Project European Wind Energy Master	Compulsory	9	I, S	2 Partial Examinations
phy987 Control of Wind Turbines and Wind Farms	Compulsory	6	L, E	1 Examination
phy991 Stochastic Processes ¹	Elective	5	L, E, S	1 Examination
phy992 Time Series Analysis ¹	Elective	5	L, E	1 Examination
phy993 Advanced Time Series Analysis ¹	Elective	10	L, E	1 Examination
phy994 Optimisation and Data Fitting ¹	Elective	5	L, I	1 Examination
phy995 Physics of Sustainable Energy ¹	Elective	5	L	1 Examination
phy996 Offshore Wind Energy ¹	Elective	10	L	1 Examination
phy997 Wind Turbine Measurement Techniques ¹	Elective	10	L	1 Examination

phy998 Probabilistic Methods in Wind Energy ¹	Elective	5	L, E	1 Examination
phy622 Advanced Topics in Wind Energy	Elective	5	L, E, S, I	1 Examination
phy621 Advanced Engineering Topics In Wind Energy	Elective	5	L, E, S, I	1 Examination
phy645 Wind Physics Measurement Project	Elective	3	L	1 Examination
phy985 Stochastic Processes in Experiments	Elective	3	S	1 Examination

¹ The modules are offered by the partner universities.

Students must obtain at least 30 credit points from the elective modules.

II) Subtrack 2: „Wind Farms“

Module name	Module type	Credit points	Teaching format	Examination components
phy692 Research Project European Wind Energy Master	Compulsory	9	I, S	2 Partial Examination
phy623 Advanced Wind Energy Meteorology	Compulsory	3	L, E	1 Examination
phy631 Advanced Metrology	Compulsory	6	L	1 Examination
phy645 Wind Physics Measurement Project	Compulsory	3	L	1 Examination
phy985 Stochastic Processes in Experiments	Compulsory	3	S	1 Examination
phy987 Control of Wind Turbines and Wind Farms	Compulsory	6	L, E	1 Examination
phy659 Introduction to Micro Meteorology ¹	Compulsory	5	L, E, S	1 Examination
phy684 Wind Turbine Technology and Aerodynamics ¹	Compulsory	10	L, E, S	1 Examination
phy626 Dynamical Systems ¹	Compulsory	5	L,	1 Examination
phy674 Turbulence Theory ¹	Compulsory	5	L, E	1 Examination
phy688 Planning and Development of Wind Farms ¹	Compulsory	5	L, E, S	1 Examination
phy997 Wind Turbine Measurement Techniques ¹	Elective	10	L	1 Examination

phy988 Introduction to Machine Learning and Data Mining ¹	Elective	5	L	1 Examination
phy625 Deep Learning ¹	Elective	5	L	1 Examination
phy982 Intelligent Systems ¹	Elective	10	L, E	1 Examination
phy994 Optimization and Data Fitting ¹	Elective	5	L, I	1 Examination
phy995 Physics of Sustainable Energy ¹	Elective	5	L,	1 Examination
phy996 Offshore Wind Energy ¹	Elective	10	L	1 Examination
phy998 Probabilistic Methods in Wind Energy ¹	Elective	5	L, E	1 Examination
phy657 Experimental Structural Mechanics ¹	Elective	5	L, E	1 Examination
phy675 Integration of Wind Power in the Power System ¹	Elective	5	L, E	1 Examination
phy629 Optimization in modern Power Systems ¹	Elective	5	L, E	1 Examination
phy627 Emerging and disruptive Technologies of Electricity Grids ¹	Elective	5	L, E	1 Examination
phy628 Modelling and Analysis of Sustainable Energy Systems using Operations Research ¹	Elective	5	L, E	1 Examination
phy986 System Safety and Reliability Engineering ¹	Elective	5	L, E	1 Examination
phy983 Life Cycle Assessment of Products and Systems ¹	Elective	10	L, E	1 Examination
phy624 Composite Materials and Fibres ¹	Elective	5	L, E	1 Examination
phy981 HardTech Entrepreneurship ¹	Elective	10	L, E	1 Examination
phy622 Advanced Topics in Wind Energy	Elective	5	L, E, S, I	1 Examination
phy621 Advanced Engineering Topics in Wind Energy	Elective	5	L, E, S, I	1 Examination

¹ The modules are offered by the partner universities.

Students must obtain at least 25 credit points from the elective modules.

Supplement to Section 11 Types of module examinations

The nature and scope of the examination components must correspond to the number of credit points for that particular module. The scope of the various types of module examinations (with a student workload of 6 credit points, as partial examinations if applicable) is as follows:

- Written examination: Between 90 and 180 minutes
- Oral examination: Between 20 and 45 minutes
- Short presentation: Between 10 and 20 pages of written analysis plus a presentation lasting between 15 and 30 minutes
- Term paper: Between 15 and 30 pages
- Internship report: Between 15 and 30 pages, □ presentation lasting between 20 and 45 minutes
- Presentation: Between 20 and 45 minutes

Supplement to Section 15 Results of module examinations

Upon request, students may withdraw from an elective module for which they fail the module examination without stating reasons. In this case, unsuccessful attempts for the alternative elective module will be counted.

Supplement to Section 20 Admission to the Master's thesis phase

For admission to the Master's thesis phase, students must be enrolled in the corresponding Master's programme at the Carl von Ossietzky University of Oldenburg or the University of Applied Sciences Emden/Leer and meet the additional requirements stipulated in Section 20 of the examination regulations.

Supplement to Section 21 Final Master's module

On 2: The topic of the Master'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 Master's programme in Engineering Physics. Subject to the approval of the Examining Board, the topic may also be set by other authorised examiners in accordance with Section 7.1, in which case the second examiner must be a professor or university 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 corresponding Master's degree programme.

On 3: The approval of the Examining Board will be required if a Master's thesis is written at an organisation outside of this University or the University of Applied Sciences Emden/Leer and supervised or evaluated by an external examiner at the organisation in question.

On 4: The Master's thesis can be written in either German or English.

Supplement to Section 23 Overall result

On 3: All module results are taken into account when determining the overall mark.
