

Appendix 11**Specific appendix for the master's programme "Renewable Energy Online" for the "Master of Science (M.Sc.)" diploma****1. University degree**

After successfully completing the master's examinations, the degree "Master of Science (M.Sc.)" will be awarded to the candidate by Faculty V – Mathematics and Natural Sciences on behalf of the Carl von Ossietzky University of Oldenburg.

2. Objectives of the study programme

(1) The objective of the study programme is to train skilled employees, providing them with the knowledge and expertise necessary to familiarize themselves with the diverse range of topics and problems encountered in the field of renewable energies so that they may pursue a specialized career. Examples of such topics include planning and development, research, participation in regional and international development organizations, and contributing to the multidisciplinary theme of sustainability in connection with the energy supply systems of the future.

(2) In accordance with the objective of the master's programme "Renewable Energy Online" stated in (1), graduates of the programme shall possess comprehensive and in-depth knowledge of the energy conversion processes used by renewable energy technologies. This includes a thorough understanding of the modes of operation of complete systems composed of energy converters, storage systems, and consumers. Graduates will be familiar with classical measuring instruments and possess the skills required to conduct measurements and represent, evaluate, and analyse large quantities of data.

(3) Graduates shall possess the skills required to identify and analyse socially and economically relevant questions regarding renewable energy technologies and their sustainability criteria. They shall be capable of working independently in a problem-oriented, scientifically grounded, and conscientious manner on multidisciplinary topics and able to present their results convincingly, with the expertise required for participation in international multidisciplinary workgroups.

(4) Upon completion of studies, graduates shall possess a comprehensive body of knowledge and expertise, enabling a successful career in any of the diverse professions in the field of renewable energy technologies.

3. Duration, scope, and organization of studies

(1) The standard duration of the master's programme "Renewable Energy Online" is seven semesters, corresponding to 3.5 years of part-time studies. This course is not offered in a full-time format.

(2) The programme includes examination requirements worth a total of 120 credit points.

(3) The programme is divided into core subjects worth 24 credit points and three orientation subjects worth a total of 66 credit points. The remaining 30 credit points are awarded for the compulsory master's degree module.

4. Curriculum

(1) The core subjects of the programme consist of the following compulsory modules:

Module title	Module type	CP	Prerequisite modules
pre600 Renewable Energy Basics	Compulsory	6	none
pre605 Renewable Energy Laboratories & Excursions	Compulsory	6	none

pre610 Introduction to Energy Resources and Systems	Compulsory	6	none
pre620 Simulation and Laboratory	Compulsory	6	none

(2) Students may tailor their studies according to a personal profile by selecting subjects from three orientations. These orientation subjects may be chosen from among the compulsory and elective modules listed in the table below. In each of the categories “Technology Orientation”, “System Orientation”, and “Social Science Orientation”, students must complete every compulsory module and at least one elective module (if available).

Module title	Module type	CP	Prerequisite modules
Technology Orientation			
pre700 Wind Energy Fundamentals and Wind Farm Design	Compulsory	6	none
pre701 Design and Simulation of Wind Turbines	Elective	6	Wind Energy Fundamentals and Wind Farm Design
pre702 Fluid Dynamics	Elective	6	Wind Energy Fundamentals and Wind Farm Design
pre703 Computational Fluid Dynamics	Elective	6	Wind Energy Fundamentals and Wind Farm Design
pre710 Basics of Photovoltaics	Compulsory	6	none
pre711 Solar Resources and Systems	Elective	6	Basics of Photovoltaics
pre720 Energy Storage	Compulsory	6	none
Pre730 Selected Technologies of Renewable Energy	Compulsory	6	none
System Orientation			
pre770 Grid-Connected and Off-Grid RE Systems	Compulsory	6	none
pre771 Grid Integration Project	Elective	6	Grid-Connected & Off-Grid RE Systems
pre772 Off-Grid Electrification Project	Elective	6	Grid-Connected & Off-Grid RE Systems
Social Sciences Orientation			
pre780 Energy and Society	Compulsory	6	none
pre781 Renewable Energy and Sustainability	Elective	6	Energy and Society

(3) The master's degree module is composed of the master's thesis and a final colloquium.

Module title	Module type	CP	Recommendations for participation
mam Master's degree module	Compulsory	30	none
a) Master's thesis		24	none
b) Final colloquium		6	none

5. Credit recognition

The recognition of previously completed studies and examination requirements is governed by §7 of these regulations.

6. Types of module examination

(1) Each examination requirement except for the master's thesis shall be completed in parallel to the studies of the corresponding module.

(2) Each module requires the completion of one of the following types of examination in parallel to studies:

- Written examination or online examination (6);
- Oral examination (7);
- Presentation of a paper (8);
- Term paper (9);
- Practical exercises (10);
- Presentation (11);
- Portfolio (12).

(3) Module examinations may be organized by groups. The contributions of each candidate must individually satisfy the criteria of the relevant examination requirements and must be clearly identifiable for individual grading, e.g. by indicating sections, page numbers, or other objective criteria.

(4) The nature of the module examination must adequately reflect the skills acquired during the module. The grade awarded must be justified by citing the primary reasons for any grading decisions.

(5) Full participation is required during the attendance phases of each module. Absences may be approved in exceptional circumstances by the course director. Any approved absence will usually entail (proportionate) additional work to compensate for missed activities (e.g. extra coursework, written feedback on presentations).

(6) Written examinations require the candidate to demonstrate the capacity to work on a given problem using standard methods and limited resources in a supervised setting under time constraints. Written examinations usually last for 90 to 120 minutes. If an online format is chosen a module, students must submit a written declaration under the honour system that the examination was completed independently without unauthorized assistance.

(7) Oral examinations typically have a duration of between 30 and 45 minutes per candidate. The key items of the examination and the grader's assessment of the examination requirement must be recorded in a transcript.

(8) A presentation of a paper is composed of:

- a) an independent and in-depth written discussion of a problem relating to the content of the module in 3,000 to 4,000 words, including a review and analysis of the relevant literature;
- b) a presentation of this work and an oral exposition of its findings lasting 15 to 30 minutes followed by a discussion.

(9) A term paper is a self-contained and in-depth written analysis of a subject-specific or multidisciplinary problem assignment in 4,000 to 6,000 words.

(10) Practical exercises are a series of practical experiments, exercises, or programming tasks documented by a written report (e.g. experimental report of 3,000 to 4,000 words).

(11) A presentation is an oral talk that presents a state-of-the-art scientific topic using suitable methods and formats. This presentation should usually last from 30 to 45 minutes and is followed by a discussion.

(12) A portfolio is a collection of 2 to 5 items of coursework (including papers (a), brief presentations (b), exercises (c), brief oral test transcripts (d), brief written tests (e), experimental reports (f), write-ups (g), subject diaries (h)). The examination formats listed under §6(1) and (2) will never be required as part of a portfolio. The portfolio is graded as a whole.

- a) A position paper is a self-contained written discussion of a subject-specific problem in 500 to 2,000 words.
- b) A brief presentation of a paper is analogous to the full presentation of a paper described in (8) except with a written length of 500 to 2,000 words and a presentation period of 10 to 15 minutes.
- c) Online exercises require students to demonstrate the ability to solve scientific problems using the knowledge and methods learned during the module. Online exercises are published on the online learning environment and must be completed with the specified deadline. The total time required to complete online exercises should generally not exceed 30 hours in total.
- d) Brief oral tests typically last from 10 to 15 minutes per candidate. The key items of the examination and the grader's evaluation of the examination requirement must be recorded in a transcript.
- e) Brief written tests require the candidate to demonstrate the capacity to work on a given problem using standard methods and limited resources in a supervised setting under time constraints. Brief written tests typically last from 45 to 60 minutes.
- f) An report is a written discussion of a practical experiment in 500 to 2,000 words.
- g) A review is a written discussion evaluating a subject-specific article in 500 to 2,000 words.
- h) A learning diary is an independently managed record of the student's learning progress in 500 to 2,000 words.

(13) Active participation may be considered a prerequisite for module examinations. Some modules apply teaching and learning methods based on dialogue and discussions between teachers and students to convey key components of the target knowledge and expertise. In this context, competency-building and hence achieving the teaching objectives of the module is only possible with regular and active participation from students (cf. the first sentence of §7(4) NHG). Modules for courses that teach content in a practical or illustrative way or primarily by means of dialogue between students and teachers may therefore formally require "active participation" in order to award credit points. Whenever formally required, active participation is not graded. Active participation is defined as regular, documented, and successfully conducted participation in lectures or the relevant teaching arrangements of the module. The criteria for active participation must be transparently established and documented in written form at the beginning of the module by the lecturer in consultation with students; the expected workload should be made clear and should be reasonable in relation to the full scope of the course or module. Forms of active participation can for example include preparing solutions to practical, illustrative, or discussion-oriented exercises, documenting the experiments or practical work conducted during the module, contributing constructively to discussions of seminar papers, or presenting exercises or other work during lectures in the form of a brief report. The lecturer is responsible for deciding whether a given student has met the criteria for active participation.

7. Colloquium and master's thesis

(1) Students must acquire at least 72 credit points before they are eligible to register for the master's thesis. Each student must submit an exposé coordinated with the primary reviewer when registering for the master's thesis. The drafting of the master's thesis takes place during the master's degree module.

(2) Each student must submit a written proposal to the Examination Board to register for the master's thesis.

(3) The timeframe of the master's thesis is twelve months from the date the topic is issued. The Examination Board may extend this timeframe once by up to 12 weeks in individual cases.

(4) The master's thesis must have a length of between 60 and 80 pages (DIN A4) with a font size of 12 pts and line spacing of 1.5 lines. The master's thesis must be written in English. The master's thesis may not be completed in groups.

(5) Participation in the final colloquium is compulsory.

(6) The final colloquium requires the student to present the findings of his or her master's thesis, thus demonstrating in a documented manner that he or she is capable of independent work on a subject-relevant multidisciplinary and problem-oriented topic according to scientific principles and furthermore possesses the skills to present his or her conclusions in a clear and comprehensible manner.

(7) The final colloquium is typically conducted by the reviewers after the submission of the master's thesis; it should not exceed 60 minutes.

(8) The grade awarded for the master's degree module is calculated from the grades awarded for the master's thesis and the final colloquium, weighted by the corresponding number of credit points.

8. Final grade

(1) The candidate is considered to have passed the master's examination once he or she has acquired 120 credit points. The examination requirements of each of the required modules listed under Section 4 of this appendix, as well as the master's thesis itself, must have been completed with a grade of "sufficient" (4.0) or higher.

(2) The final grade of the master's examination is decided by the Examination Board. This process is described in §12.