

Subject-specific enclosure 12 Postgraduate Programme Renewable Energy

Supplement to § 2 Study Objectives

The Master course of studies “Postgraduate Programme Renewable Energy (PPRE)” aims at imparting fundamental and diverse knowledge about processes of energy conversion in Renewable Energy technologies.

Consequently, PPRE conveys detailed knowledge about the functionalities of complete systems, consisting of energy converter, storage and consumer. Students gain knowledge about classic measuring equipment and, eventually, are able to take measurements and to analyze, evaluate and present large amounts of data.

The Master course offers five different specialization topics: Photovoltaics, Wind Energy Convertors & Fluid Dynamics, Design & Simulation of Wind Turbines, System integration of Renewable Energies and Renewable Energy in Developing Countries. Through these students obtain a profound knowledge in the field of their choice.

Students gain the ability to investigate and evaluate socially and economically relevant issues around the implementation of Renewable Energy technologies as well as criteria of their sustainability.

Students are enabled to do independent, interdisciplinary and problem-oriented scientific work responsibly and to show the results in a coherent way.

The programme increases the students’ ability to cooperate in international multidisciplinary workgroups.

The goal of PPRE is to train skilled scientists and experts who are able to work their way into the various areas and issues of Renewable Energy and become specialists in their respective fields. These fields include research, planning and development, working in regional or international developmental organisations and, finally, dealing with interdisciplinary issues of sustainability concerning future systems of energy supply.

Supplement to § 9 Admission to Modules and Module Examinations

To (6): Active Participation (according to § 9 para. 6 MPO)

Seminars, exercises and colloquia are teaching and learning types in which the students acquire a significant fraction of the knowledge and skills to be obtained via dialog and discursive methods involving students and teachers. Build-up of competence and therewith achievement of the objectives of the course are only possible when students participate regularly and actively in the course (compare. § 7 para. 4 sentence 1 NHG).

As a prerequisite for the awarding of credit points an “active participation” may be constituted in modules with courses which convey the teaching content practically or mainly via the dialog of students and teachers (laboratories, exercises, seminars, excursions). The performance of the active participation are not marked. Active participation according to § 9 para.6 MPO is the regular, documented and successful participation in the courses resp. appropriate sections of courses. The corresponding criteria for active participation will be constituted in the beginning of the course in discourse with the students, presented transparently and noted down in written

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word; here the estimated workload is to be displayed and put into appropriate relation to the total workload of the course resp. the module. Types of active participation are for example the preparation of solutions to practical or discussion motivating exercises, the report writing to performed experiments resp. practical tasks, the constructive participation at discussions in seminars or presentations of tasks resp. contents in the resp. course in type of short reports. The decision whether or not the criteria for successful active participation are fulfilled is made by the teacher.

In modules in which active participation is constituted details are given in table §10 column Type and number of module examinations or the corresponding module handbooks.

Supplement to § 10 Structure and Content of the Modules

To (15): the following modules are offered in the Master study program:

Module name	Module type	ECTS	Course types	Type and number of module examinations
pre011 Fundamentals for Renewable Energy	compulsory	12	lecture, exercise, laboratory	<u>2 examinations:</u> practical exercise (laboratory reports and exercises, weight: 75%) and either assignment (10-15 pages) or presentation (15-20 min) (weight: 25%)
pre021 Energy Resources and Systems	compulsory	6	lecture	<u>1 examination:</u> written exam (2h)
pre031 Renewable Energy Technologies I	compulsory	12	lecture, exercise	<u>2 examinations:</u> Written exam (3h, weight 75%) as well as Presentation of a paper (15 min. presentation, 15 pages report, weight 25%).
pre041 Sustainability of Renewable Energy	compulsory	6	lecture, seminar	<u>1 examination:</u> assignment (20 pages) or presentation of a paper (presentation - 45 minutes and paper 10 pages)
pre051 Renewable Energy Systems Laboratory and Modelling	compulsory	6	lecture, laboratory	<u>1 examination:</u> Conference contribution (see §11 supplement to para. 15)
pre111 Photovoltaic Physics	compulsory elective	6	lecture, exercise	<u>1 examination:</u> Practical exercises (max. 8)
pre112 Photovoltaics Systems & Meteorology	compulsory elective	6	lecture, seminar	<u>1 examination:</u> Written exam (2h). Active participation is constituted in the seminar (see §9 supplement to para. 6) and is requirement for the participation of the written exam.
pre121 Wind Energy Converters & Fluid Dynamics	compulsory elective	12	lecture, exercise	<u>1 examination:</u> Written exam (3h) or presentation (30 min.) or oral exam (45 min) or practical exercise (max. 10) or assignment (max. 30 pages)

pre131 Design and Simulation of Wind Turbine	compulsory elective	12	lecture	<u>1 examination:</u> Written exam (3h) or presentation (30 min.) or oral exam (45 min) or practical exercise (max. 10) or assignment (max. 30 pages)
pre141 System Integration of Renewable Energy	compulsory elective	12	lecture, seminar	<u>1 examination:</u> presentation of a paper (presentation: 50 min, paper: 5 pages) or exercises (8 exercises). Active participation is constituted in the seminar (see §9 supplement to para. 6).
pre051 Renewable Energy in Developing Countries	compulsory elective	12	lecture, seminar	<u>1 examination:</u> term paper (40 pages) or presentation of a paper (presentation - 45 minutes, paper 20 pages). Active participation is constituted in the seminar (see §9 supplement to para. 6).
pre061 Renewable Energy Complementary Topics	compulsory elective	6	lecture, seminar, exercise	<u>2 examinations:</u> The module is not marked, but 2 of the possible course options must be passed in order to pass the module. Possible examination types are: Written exam (1 h), oral exam (20 min), presentation of a paper (10 paper + 10 min presentation), assignment (max. 20 pages), practical exercise (max. 8), term paper (max. 20 pages), portfolio, presentation (15 min.) Active participation is constituted in seminars (see §9 supplement to para. 6).
pre071 Internship	compulsory	9	internship, seminar	<u>1 examination:</u> presentation of a paper (presentation + discussion (20min) and internship report (20 pages)
pre081 Renewable Energy Project	compulsory	9	lecture, seminar, excursion	<u>1 examination:</u> (group) presentation of a paper (15min) and (group) project-report (15 pages)
pre091 Transferrable skills	compulsory elective	6	lecture, seminar, exercise, laboratory	<u>2 examinations:</u> The module is not marked, but 2 of the possible course options must be passed in order to pass the module. Possible examination types are: Written exam (1 h), oral exam (20 min), presentation of a paper (10 paper + 10 min presentation), assignment (max. 20 pages), practical exercise (max. 8), term paper (max. 20 pages), portfolio, presentation (15 min.) Active participation is constituted in seminars (see §9 supplement to para. 6).
pre034 RE Technologies II	compulsory elective	6	lecture, seminar, exercise, laboratory	<u>2 examinations</u> Presentation of a paper in each of the visited courses. Each exam will be weighted 50%.

In all modules the oral exam is accepted as examination type especially for repetitions of examinations. In 6 credit point modules the duration is 30 minutes. In modules larger than 6 credit points the duration is maximally 45 minutes.

Supplement to § 11 Types of Module Examinations

To (15): The following other examination types in the sense of §11 para. 1 page 2 no. 11, para. 15 of the general part of this regulation (German version) are accepted as module examinations:

- Conference contributions:

A conference contribution consists of the preparation and presentation of an article or a conference presentation or a poster (incl. –defense) to the content of the module as group work. The learning objective is the collaborative preparation and subject-specific communication of natural scientific results using the common media. For the conference contribution the mark will be given for the whole group.

Supplement to § 15 Repetition of Module Examinations, Free-Trial Examinations

To (5): Free trial examinations to improve grades are excluded.

Supplement to § 21 Master Dissertation

To (4) The Master's thesis can be written in German or English.

To (5): The 30 credit points for the master dissertation module are distributed as follows: 24 credit points for the master thesis and 6 credit points for the final colloquium.

To (10): The final colloquium generally consists of a 20-minute presentation and a 10-minute defense.

Supplement to § 23 Overall Result

To (3): For the determination of the overall result, all module grades have to be considered.