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Examination Regulations

M.Sc. Wind Energy Systems
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Examination regulations for the online Master's program Wind Energy Systems of the department Civil and Environmental Engineering at the University of Kassel
Dated 1. January 2013

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§ 1 Scope

The examination regulations for the postgraduate program 'Wind Energy Systems' of the Faculty of Civil and Environmental Engineering supplements the general provisions for examination regulations with the Bachelor's and Master's degrees at the University of Kassel in the respectively applicable version.

§ 2 Academic degrees, Profile

(1) The aim of the course Wind Energy Systems is to impart comprehensive knowledge in the field of wind energy. The purpose of the study is to provide specialised knowledge and acquisition of skills in the field of technical and non-technical aspects of the production and use of wind energy. The study program qualifies people to analyse, design, develop and operate wind energy systems. Content-wise, there are two fields of specialisation 'Simulation and Structure Technology' and 'Energy System Technology'.

(2) As a result of passing the Master's examination, the Department of Civil and Environmental Engineering awards the academic degree of 'Master of Science' (M.Sc.).

(3) The Master's course in Wind Energy Systems is designed to be predominantly research-oriented.

(4) The course can be completed on part-time, extra-occupational basis. It is designed as a distance learning course and uses several information and communication technologies for multimedia learning.

(5) The course will be held in English.

§ 3 Standard duration of study, Scope of the program

(1) The standard duration of the Master's program, including writing the Master's thesis and the colloquium is seven semesters on an extra-occupational basis.

(2) A total of 120 credits will be awarded for successfully finishing the Master's program. Of which 30 credits are for the final Master's module.

§ 4 Start of study program

The Master's program can only be started in the winter semester.

§ 5 Examination Board

(1) The examination board makes all decisions regarding examination issues in the Master's program Wind Energy Systems.

(2) The examination board consists of representatives of the divisions involved in the study course: Civil and Environmental Engineering, Mechanical Engineering, Electrical Engineering, Computer Science, Mathematics and the Fraunhofer Institute for Wind Energy and Energy System Technology (IWES).

The examination board consists of:
- one professor from the Department of Civil and Environmental Engineering,
- one professor or a research assistant of the Fraunhofer Institute for Wind Energy and Energy System Technology,
- one professor from the department of Mechanical Engineering or Electrical Engineering and Computer Science or the Institute for Mathematics,
- one research staff member from the university departments involved in this study program or...
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from the departments at the Fraunhofer Institute,
- one student member of the Master's program Wind Energy Systems.

(3) The professors will be chosen by the faculty councils of the respective departments, the research staff and the student member will be chosen by the faculty council of the department of Civil and Environmental Engineering, in coordination with the Fraunhofer IWES.

(4) The examination board may, in accordance with § 6 paragraph 3, delegate the course guidance to responsible university professors, or in exceptional cases, even to other proven and qualified persons.

§ 6 Admission requirements for the Master's degree

(1) Only those can be admitted to the Master's program, who

1a. have a Bachelor's degree, diploma or equivalent degree with at least 180 Credits from a university in the Federal Republic of Germany or an equivalent university abroad in a technical or scientific study program in the subject fields civil and environmental engineering, mechanical engineering, electrical engineering, physics, or have completed a comparable technical study program

or

1b. have a Bachelor's degree, diploma or equivalent degree with at least 180 credits from a university in the Federal Republic of Germany or an equivalent university abroad in another program with basic subjects from the fields of mathematics, natural sciences and engineering and achieved at least 60 credits, of which at least 18 credits are in the field of mathematics (analysis, algebra). In special cases, the examination board can decide that individual records, that are required for admission, can be provided after the study program has commenced

and

2. has particularly acquired the following professional qualifications during the previous course of study
   - 'good' mathematical knowledge,
   - 'good' knowledge of technological sciences
   - 'good' basic knowledge of natural science

and

3. can convincingly describe in a letter of motivation along with their application (max. two pages) their personal motivation, as well as provide proven suitability for the Master's course through a record of previous academic performance, work experience and scientific work

and

4. can prove at least one year of professional experience after finishing the first course of higher education

as well as

5. can prove language skills of level B2 in English.

(2) The existence of the conditions, according to paragraph 1, is determined by the written application documents.

(3) Additional qualifying module exams can also be included in the diploma supplement.
§ 7 Credits, module exams, repetitions

(1) The course–related module exams are to be completed in temporal and factual combination with a module.

(2) Assessed assignments can be:
   • Written examination (approx. 15 minutes per credit)
   • Online–test (with subsequent online submission–colloquium – optional) (approx. 15 minutes per credit)
   • Oral examination or online examination via Skype or similar (approx. 5 minutes per credit)
   • Reports/written essays (with subsequent online submission–colloquium – optional) (approx. 3 pages per credit)

The nature of the examination of a module or sub–module is set by the lecturer at the beginning of the course which the module examination is about. The examination will be set according to the framework of the regulations of the study and examination curriculum.

(3) The course–related module exams can also consist of several partial exams (partial module exams).

(4) The module examination is passed if the partial module exams have been assessed with an average of at least 'sufficient' (4.0).

(5) Module exams that were not passed can be repeated two times. It is not possible to repeat a module exam that was passed.

(6) When registering for an examination, a module has to be assigned, or the exam counts as an additional exam.

(7) Module exams can, with the agreement of the examiner or examiners, be taken in another language.
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(8) In order to conceptually plan the Master’s program, the student has to set an individual study plan after consulting with the examination board at the beginning of the course. This study plan has to be approved by the examination board. If necessary and in accordance with § 6, additional module examinations have to be listed in this curriculum. The curriculum can be changed after consulting with the examination board.

Corresponding Master’s study plans can be found in Annex B. Further decisions on compulsory modules completed in the first course of studies will be made by the examination board.

§ 8 Examination components of the Master’s degree

(1) The Master’s examination consists of the following module exams including the final Master module in accordance with § 10 with the according credits.

<table>
<thead>
<tr>
<th>Module</th>
<th>Description</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Basic modules</td>
<td>Fundamentals of mathematics and engineering for wind energy systems</td>
<td>30</td>
</tr>
<tr>
<td></td>
<td>Selection of 36 credits, required minimum of 30 credits</td>
<td></td>
</tr>
<tr>
<td>Optional compulsory module</td>
<td>Application of Software Tools</td>
<td>6</td>
</tr>
<tr>
<td>Optional compulsory module</td>
<td>Mathematics</td>
<td>6</td>
</tr>
<tr>
<td>Optional compulsory module</td>
<td>Solid Mechanics</td>
<td>6</td>
</tr>
<tr>
<td>Optional compulsory module</td>
<td>Fluid Mechanics</td>
<td>6</td>
</tr>
<tr>
<td>Optional compulsory module</td>
<td>Electrical Engineering</td>
<td>6</td>
</tr>
<tr>
<td>Optional compulsory module</td>
<td>Design of Mechanical and Electrical Components</td>
<td>6</td>
</tr>
<tr>
<td>Specialisation Modules and additional key</td>
<td>Selection from 126 credits, required minimum of 60 credits, at least 30 of</td>
<td></td>
</tr>
<tr>
<td>competencies</td>
<td>the 60 credits must be achieved in one of the two fields of specialisation</td>
<td></td>
</tr>
<tr>
<td></td>
<td>'Simulation and Structural Technology'</td>
<td></td>
</tr>
<tr>
<td>Specialisation Modules</td>
<td>Simulation and Structural Technology</td>
<td>60</td>
</tr>
<tr>
<td>Optional compulsory module</td>
<td>Theoretical Fluid Mechanics</td>
<td>6</td>
</tr>
<tr>
<td>Optional compulsory module</td>
<td>Computational Fluid Dynamics</td>
<td>6</td>
</tr>
<tr>
<td>Optional compulsory module</td>
<td>Linear Computational Structural Mechanics</td>
<td>6</td>
</tr>
<tr>
<td>Optional compulsory module</td>
<td>Non-linear Computational Structural Mechanics</td>
<td>6</td>
</tr>
<tr>
<td>Optional compulsory module</td>
<td>Strength Durability and Reliability</td>
<td>6</td>
</tr>
<tr>
<td>Optional compulsory module</td>
<td>Rotor Blades</td>
<td>6</td>
</tr>
<tr>
<td>Optional compulsory module</td>
<td>Towers</td>
<td>6</td>
</tr>
<tr>
<td>Optional compulsory module</td>
<td>On and Offshore Foundations</td>
<td>6</td>
</tr>
<tr>
<td>Optional compulsory module</td>
<td>Rotor Aerodynamics</td>
<td>6</td>
</tr>
<tr>
<td>Specialisation Modules</td>
<td>Energy System Technology</td>
<td></td>
</tr>
<tr>
<td>Optional compulsory module</td>
<td>Wind Energy Meteorology</td>
<td>6</td>
</tr>
<tr>
<td>Optional compulsory module</td>
<td>Energy Storage</td>
<td>6</td>
</tr>
<tr>
<td>Optional compulsory module</td>
<td>Control and Operational Management of Wind Turbines and Wind Farms</td>
<td>6</td>
</tr>
<tr>
<td>Optional compulsory module</td>
<td>Construction and Design of the Nacelle Systems</td>
<td>6</td>
</tr>
<tr>
<td>Optional compulsory module</td>
<td>Technical and Economic Aspects of Grid Integrations</td>
<td>6</td>
</tr>
<tr>
<td>Optional compulsory module</td>
<td>Reliability, Availability and Maintenance Strategies</td>
<td>6</td>
</tr>
<tr>
<td>Additional Key Competencies</td>
<td>Selection of 24 credits, required minimum of 12 credits</td>
<td></td>
</tr>
</tbody>
</table>
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<table>
<thead>
<tr>
<th>Optional compulsory</th>
<th></th>
<th>3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Optional compulsory</td>
<td>Occupational Safety On and Offshore</td>
<td>3</td>
</tr>
<tr>
<td>Optional compulsory</td>
<td>Energy Law</td>
<td>3</td>
</tr>
<tr>
<td>Optional compulsory</td>
<td>Personal Management</td>
<td>3</td>
</tr>
<tr>
<td>Optional compulsory</td>
<td>Project Management</td>
<td>3</td>
</tr>
<tr>
<td>Optional compulsory</td>
<td>Planning and Construction of Wind Farms</td>
<td>3</td>
</tr>
<tr>
<td>Optional compulsory</td>
<td>Business Administration and Management of Wind Turbines and Wind Farms</td>
<td>3</td>
</tr>
<tr>
<td>Optional compulsory</td>
<td>Contract Law</td>
<td>3</td>
</tr>
<tr>
<td>Master Module</td>
<td></td>
<td>30</td>
</tr>
<tr>
<td>Compulsory module</td>
<td>Master Thesis</td>
<td>25</td>
</tr>
<tr>
<td>Compulsory module</td>
<td>Colloquium</td>
<td>5</td>
</tr>
</tbody>
</table>

(2) At least 30 credits must successfully be completed in one of the two areas of specialisation 'Energy Systems Technology' and 'Simulation and Structural Technology'.

(3) Proven knowledge, skills and competences acquired both outside and in higher education, can be taken into account by the examination board upon request, provided they comply with the content and level of the module examinations of the course and are of equal value.

(4) Considerations can only be carried out if the university admission requirements have been met at the time of consideration.

§ 9 Additional key competencies

(1) For a Master's degree in Wind Energy Systems, a total of 12 credits must be acquired in the modules of the additional key competencies.

§ 10 Final Master's module

(1) Master's thesis and Master's colloquium form the final Master's module. For this module 30 credits will be awarded. 25 credits of this are awarded for the thesis and 5 credits for the Master's colloquium.

(2) Those students who successfully completed modules with at least 78 credits will be admitted for the Master's thesis. The examination board issues the topic and assigns a reviewer, who will supervise the thesis. The student has the right of nomination.

(3) The time to write the Master's thesis is twelve months and starts with the day the topic has been announced. The topic of the Master's thesis may only be returned once and only within two months. It must be set up so that it can be written within the scheduled time limit.

(4) If the first deadline cannot be met for reasons that the candidate cannot be held liable for, then the examination board will extend the deadline by the time of prevention, but no longer than six months.
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(5) The Master’s thesis must be written in English.

(6) The Master’s thesis has to be submitted in electronic form to the examination board.

(7) The Master’s thesis has to be presented in a Master’s colloquium. In addition to the candidate, the examiners will participate in the colloquium. Students of the study program Wind Energy Systems are entitled to participate in the colloquium as listeners. The Master’s colloquium should take place no later than three months after submitting the Master’s thesis. The duration of the entire colloquium is 60 minutes. Participating in the Master’s colloquium requires that a grade of at least ‘sufficient’ (4.0) was achieved in the Master’s thesis.

(8) In order to pass the final module, Master’s thesis and Master’s colloquium have to be assessed at least with ‘sufficient’ (4.0). The grade of the colloquium goes, in proportion to the distribution of the credits of Master's colloquium and Master's thesis, (5 to 25) into the grade of the final module. A Master’s colloquium that has not been passed with at least ‘sufficient’ (4.0) can be repeated once.

§ 11 Composition and weighting of grades

(1) A module is passed and can be considered as part of the Master's degree, if the module was assessed with at least 'sufficient' (4.0).

(2) If a module grade consists of multiple partial module examinations, the module grade will be calculated from the partial examinations as equal parts, as long as the module description intends no specific weighting.

(3) The overall score for the Master's examination is derived from the arithmetic mean of the module grades weighted by the credits.

§ 12 Coming into force

These examination regulations shall come into force on the day after its publication in the gazette of the University of Kassel.

Kassel, the [date of signature]

The dean of the Faculty of Civil and Environmental Engineering
Prof. Dr. Volkhard Franz