

Examination and Study Regulations for the International Master Programme Power Engineering

as of (date of issue)

On the grounds of § 5 paragraph 1 sentence 2 in connection with §§ 18 paragraph 2 sentence 1, 21 paragraph 2 sentence 1, 70 paragraph 2 number 1 of the law on Higher Education in Brandenburg - Brandenburgisches Hochschulgesetz (BbgHG) of December 18, 2008 (GVBl. I/08, [Nr. 17] S.318) in the valid form – the Brandenburg University of Technology in Cottbus (BTU) sets itself the following statute:

I. General Regulations

Current Examination and Study Regulations for Master Programmes (RahmenO) at BTU (§§ 1 to 27) in its effective version are valid.

II. Subject-Related Regulation

§ 28 Scope of Validity

These subject-related regulations regulate for the students the structure and procedures of the international study programme Power Engineering. They are only valid in connection with the General Regulations for Master Programmes at BTU in Section I.

§ 29 Goal of the Programme

The Master Programme has a research oriented profile and aims at conveying to the students professional skills and knowledge in the use of the tools and methods in the field of Power Engineering, in research activities, in critical coordination of the scientific cognition, such as an independent formulation of the own scientific contribution to the field.

§ 30 Graduation, Degree

Upon successful completion of the Study Programme Power Engineering the academic degree “Master of Science” (M.Sc.) is awarded.

§ 31 Additional Admission Requirements

(1) Following admission requirement are valid additionally to § 4:

- Proof of the first academic degree (Bachelor level) with a standard period of study of minimum six semesters in the field of Power Engineering or a related field. Academic qualifications will be evaluated by the examination board.
- Applicants for the master programme Power Engineering are required to provide the proof of an English language test (e.g. Test of English as a Foreign Language (TOEFL) with min. 550 points (paper based) or equivalent). Exempt from this rule are applicants from the countries where English is the first official language.

- (2) Admission of the students to the Study Programme Power Engineering is subject to further acceptability evaluation. All the decisions on acceptability are taken by the examination board.

§ 32 Structure and Form of the Programme

- (1) The Study Programme Power Engineering comprises the following branches of study:
- Electrical power Engineering
 - Power Plant Technology
 - Sustainable Energy Supply
- (2) Organisation of the Programme and study modules are shown in Appendix 1. Table 1 offers an overview of the Programme structure.
- (3) Tables 2 to 4 illustrate core elements of the training in the respective branches of study. Recommendations as to the choice of the modules for specialisation in the respective branches of study are offered as well. The courses that have already been completed in the bachelor study course at BTU can not be taken again.
- (4) Free selection modules in Engineering can be chosen from the module catalogue for Master Programme Power Engineering. Free selection modules from total offer of BTU can be chosen from offers in natural, engineering and economic sciences at BTU. **Note** that free selection modules have to be relevant to the programme. A list of highly recommended free selection modules for relevant branches of study can be consulted with at the respective mentor.
- (5) A 10 week internship is an integral part of the Master studies, see Appendix 2. It can be undertaken at any time of studies. For foreign students it can be replaced by a 6 week internship and a German language course of 4 credit points. In exceptional cases a 6 week internship can be replaced by an equivalent study project of 6 credit point. Exceptions are made by the examination board.
- (6) The interdisciplinary study courses can be chosen freely from the offer of BTU.
- (7) The language of instruction and examination at the master programme Power Engineering, as an international study programme, is English.

§ 33 Examination Board and Course Guidance

- (1) Examination board for the Study Programme Power Engineering will be appointed by the faculty 3 in compliance with § 14.
- (2) The member of the examination board takes over the administration of the Study Programme.
- (3) An academic assistant of the examination board takes over the course guidance.

- (4) Examination board also monitors the offer of modules and decides if required on the amendments in Tables 2 to 4.

§ 34 Mentors and Study Plan

- (1) A student has to present the Examination Board an overall study plan of 120 credit points, previously approved by the mentor, by the end of the **sixth lecture week** of the first semester. The study plan should outline the choice of the branches of study and modules as well as individually determined deadlines for taking exams.
- (2) A mentor has the right to decline the proposed study plan or return it for modifications. The change of the mentor requires the permission of the examination board. Deviations from the approved study plan are possible only after the approval of an examination board.

§ 35 Form and Content of the Master Exam; Examination Deadlines

- (1) Master exam consists of the modules listed in Appendix 1, Table 1 with the related exam and study performances given in the module description.
- (2) Exam performances should be achieved in accordance with the module description. They have to be attempted for the first time at the latest in the fifth semester of studies. Re-examination has to be taken at the latest in the seventh semester, as well as the master thesis is to be completed the latest in the seventh semester. In case these terms are not complied with due to individual reasons, no further exams in the study programme can be taken. The assertion of reasons, which, according to sentence 1, allow the terms to be exceeded, are outlined in § 16 paragraph 2 of the Regulations for Master Programmes.
- (3) The Masters thesis has to be completed in five months (without the preparation time for a defence). An extension is decided upon application by the Head of the Examination Board.
- (4) Maximum two already achieved examination performances can be repeated for the purposes of the grade improvement. In this case the best examination performance counts. Master thesis is excluded from this regulation.

§ 36 Registration of the Master Thesis

- (1) A student has to achieve 70 credit points by the time of the registration of a master thesis. Exceptions are decided upon by the examination board.
- (2) The candidate can submit suggestions on the topic of the master thesis.
- (3) The master thesis can be performed in the form of a group work on condition that individual contributions of each candidate can be clearly separated and evaluated according to the number of chapters, pages or other objective criteria.

§ 37 Efficacy, Interim Regulations, Invalidation

- (1) These regulations come into effect from the day of their publication.
- (2) Students, which are already enrolled in the Master Programme Power Engineering, when those regulations enter into force, change into new regulations with the registration for the next semester. In that semester they have to compose a study plan in accordance with § 34.
- (3) The Exam and Study regulations for Master Study Programme Power Engineering from 16th of May 2008 (Abl. 21/2008), becomes invalid with the qualifications mentioned in paragraphs 2.

Appendix 1

Table 1: Structure of the Study Programme Power Engineering

Content	Choice	Semester				EP/SP
		1. Sem.	2. Sem.	3. Sem.	4. Sem.	
Common Module	Choose 24 CP from Tab. 2	24 CP				EP
Basic Modules	Choose 18 CP from Tab. 3	18 CP				EP
Modules for Specialization in branches of study	Choose 18 CP from Tab. 4	18 CP				EP
Free selection Modules	Choose					
- free selection modules in Engineering	12 CP from entire M.Sc. Power Engineering	12 CP				EP
- free selection modules BTU	8 CP from BTU entire offer	8 CP				EP
- Interdisciplinary modules	6 CP from BTU FÜS	6 CP				EP
Internship, Languages:						
Industrial internship (10 weeks)		10 CP				SP
<i>optional for foreign students:</i>						
Industrial internship (*) (6 weeks)					(6CP)	SP
German as a foreign language		(4CP)				SP
Master thesis					24 CP	EP
Total		60 CP			60 CP	

CP credit points

EP examination performance

SP study performance

(*) alternative study project according to § 32 paragraph (5)

Table 2: Common Modules

Name of the Module	CP
Introduction in Electrical Power	6
Control Engineering	6
Power System Economics I	6
Power System Economics II	6
Signal Processing and Optimization Methods in Data Mining	6
Power Quality and Industrial Ecology for Smart Manufacturing	6

Table 3: Basic Modules

Name of the Module	CP
<u>Recommendations for the branch of study “Electrical Power Engineering”</u>	
Medium- and Low-Voltage Technology	6
Basics in Grid Calculation	6
Renewable Energy Technologies for Electrical Power Supply	6
Fundamentals in Power Electronics	6
<u>Recommendations for the branch of study “Power Plant Technology”</u>	
Power Plant Technology 1	6
Power Plant Technology 2	6
Fundamentals in Thermal Process Engineering	6
Auxiliary Power Supply of the Power Plant	6
<u>Recommendations for the branch of study “Sustainable Energy Supply”</u>	
Renewable Energy Technologies for Electrical Power Supply	6
Power Plant Technology 1	6
Biomass and Biogas Co-Generation 1	6
Biomass and Biogas Co-Generation 2	6

Table 4: Modules for Specialisation

Name of the module	CP	For specialization in (*)
<u>Recommendation for “Electrical Power Engineering”</u>		
High Voltage Engineering and Insulating Materials	6	PTD
Power Automation	6	PTD
High Voltage Measuring and Testing Technique	6	PTD
Power Electronic Applications in High Voltage Grids	6	PTD
Energy Information Systems	6	PTD
EMC in Power Installations	6	PPG
Power Electronic Applications in Drive Systems	6	PPG
Auxiliary Power Supply of the Power Plant	6	PPG, PSO
Power System Operation	12	PPG
<u>Recommendation for “Power Plant Technology”</u>		
Technical Combustion	6	FPP
Thermal Process Engineering and Equilibrium Thermodynamics	6	FPP
Carbon Capture and Storage	6	FPP
Future Technologies in Power Plants	6	FPP
Natural Gas	6	FPP
<u>Recommendation for “Sustainable Energy Supply”</u>		
Photovoltaic	6	RPG
Technology and Operation of Wind Turbines	6	RPG
Wind Energy Economics / Wind Resources Estimation	6	RPG
Sustainable Use of Underground Resources, Geothermal Energy and CO2 Storage	4	RPG

- (*) PTD – Specialization Power Transmission and Distribution
 PPG – Specialization Power Plant Grids and Drive Systems
 PSO – Specialization Power System Operation
 FPP – Specialization Fossil Power Plants
 RPG – Specialization Renewable Power Generation

Appendix 2

Internship Regulations for the Study Programme Power Engineering

1. Scope of Validity

These Internship Regulations apply to interns, who conduct an internship within the Study Programme Power Engineering.

2. Goal and Duration of the Internship

The industrial internship should compliment the content of teaching and offer practical application of the theoretical knowledge obtained in the course of studies. At the same time it should also provide an overview of the technical, economic and social functions and operations at an industrial plant.

The internship lasts as a rule 10 weeks, in exceptional cases 6 weeks, in accordance with the Examination and Study Regulations.

3. Enterprises for the Internship

The industrial internship can be completed at power engineering plants within the country or abroad. Here belong power plant operators, network operators, producers and suppliers of the power engineering equipment as well as corresponding consulting firms. Enterprises and activities should be chosen with respect to the branches of study and aim at the consolidation of the knowledge.

BTU Cottbus does not arrange any internship positions. It is a responsibility of an intern to find and apply for an internship position.

At an internship place an intern should be coached by a supervisor at an enterprise, who defines and monitors the performed activities and records them in an internship report.

4. Internship Report, Certificate of Employment

Interns have to hand in a written report on their activities during the internship. This technical report should have the scope of 5 to 10 pages and has to be signed both by an intern and a supervisor.

The enterprise issues a certificate of employment which gives the account of the company name, the department, the duration of an internship, absence from work and a general assessment of an intern.

5. Recognition of the Internship

The recognition of the internship is performed by a professor from BTU, who instructs at the Study Programme Power Engineering. For that an internship report and a certificate of employment have to be provided.

The content and results of internship activities need to be presented in a 20 min. presentation followed by a discussion.

An internship will not be recognised when an internship report or a presentation are considered to be insufficient.

Because it is an industrial internship, only practical activities, which have direct relation to Study Programme Power Engineering and are professionally relevant, can be recognised. The director of the Study Programme takes a decision on the recognition of other practically oriented activities.

6. Disclaimer

Legal relationships exist exclusively between an enterprise and an intern.

During studies in Germany students are subject to the protection of the responsible bearers of the public accident insurance in cases of an accident: to accident insurance. And namely in the respective institution as well as on the way there and back home. If conditioned by the university a student has to stay abroad, in general the accident insurance offers protection also in such cases.

The insurance protection exists automatically (it is produced from tax means) and the contributions does not have to be paid by the insured person.