Satzung zur Änderung der Studienordnung
für den Master-Studiengang Renewable Energy and E-Mobility
an der Hochschule Stralsund

vom 19. November 2018

Aufgrund von § 2 Absatz 1 in Verbindung mit § 39 Absatz 1 des Gesetzes über die Hochschulen des Landes Mecklenburg-Vorpommern (Landeshochschulgesetz –LHG M-V) in der Fassung der Bekanntmachung vom 25. Januar 2011 (GVOBl. M-V S. 18), zuletzt geändert durch Artikel 3 des Gesetzes vom 11. Juli 2016 (GVOBl. M-V S. 550, 557), erlässt die Hochschule Stralsund die folgende Änderungssatzung:

Artikel 1

Die Studienordnung für den Master-Studiengang Renewable Energy and E-Mobility an der Hochschule Stralsund vom 14. November 2017 (veröffentlicht auf der Homepage der Hochschule Stralsund) wird wie folgt geändert:

1. In § 3 wird der Absatz 1 wie folgt neu gefasst:
„(1) Die Zeit, in der in der Regel das Studium mit dem zweiten berufsqualifizierenden Abschluss beendet werden kann (Regelstudienzeit), ist in diesem Studiengang zweifach geregelt. Der Studiengang bietet drei Studienwege mit unterschiedlichen Regelstudienzeiten:

- Im dreisemestrigen Master beträgt die Regelstudienzeit drei Fachsemester.
- Im viersemestrigen Master mit Praxissemester beträgt die Regelstudienzeit vier Fachsemester mit integriertem praktischen Studiensemester.
- Im viersemestrigen Master ohne Praxissemester beträgt die Regelstudienzeit vier Fachsemester ohne praktisches Studiensemester

Das Master-Studium schließt mit der Master-Prüfung ab.“

2. In § 6 wird der Absatz 3 wie folgt neu gefasst

„(3) Wahlpflichtmodule gehören zum Pflichtprogramm. Die Studierenden können aus einem angebotenen Pool von Lehrveranstaltungen aus dem Wahlpflichtangebot des gewählten Studienganges oder auf Antrag an den Prüfungsausschuss aus dem Fächerpool anderer Studiengänge der Fakultät bzw. dem Studienangebot der Hochschule auswählen. Es werden mindestens 8 Wahlpflichtmodule aus der offenen Liste "Application oriented – AO" und mindestens 4 Wahlpflichtmodule aus der offenen Liste "Free - F", exklusiv der AO-Module, (siehe § 10 der Fachprüfungsordnung oder § 8 Absatz 2 dieser Studienordnung) zur Auswahl angeboten. Die Durchführung der Wahlpflichtmodule setzt eine Mindestteilnehmerzahl von fünf Studierenden voraus, über Ausnahmen entscheidet der Prüfungsausschuss.“

3. In § 8 wird die Tabelle in Absatz 1 wie folgt neu gefasst:

This study plan is valid for matriculation in the summer semester. If the matriculation is in the winter semester, the first and second semesters must be exchanged.

Course	Type	1.	2.	3.	SWH	ECTS
Mathematical-scientific and technical bases					**8**	**12**
REEMM1100 - Selected Chapters of Mathematics	CM	1+3			4	6
REEMM1300 - System Theory	CM		2+2		4	6
Specialized technical bases of renewable energy					**8**	**12**
REEMM1400 - Renewable Energy Systems	CM	2+2			4	6
REEMM2200 - Methods of Power Engineering	CM		3+1		4	6
Application-oriented profiling, elective modules					**20**	**30**
REEMM2010 - Elective Module (AO) I	EM	4			4	6
REEMM2020 - Elective Module (AO) II	EM		4		4	6
REEMM2030 - Elective Module (AO) III	EM		4		4	6
REEMM2040 - Elective Module (AO) IV	EM		4		4	6
REEMM2060 - Elective Module (F) I	EM	4			4	6
Interdisciplinary qualifications (1 from 2)					**4**	**6**
REEMM3600 - Quality in Automotive Industry	EM *)	0+4			4	6
REEMM3800 - Energy and Environmental Management	EM *)		1+3		4	6
Master-Thesis with colloquium	P			6M	**6M**	**30**
Total		**20**	**20**	**6M**	**40 + 6M**	**90**

Open list of elective modules (AO) (according to § 6 of the regulations of study programme):
- Hydrogen Technology
- Solar Systems
- Wind Power Plants
- Advanced Power Electronics
- Vehicle Management Systems
- Control of electrical drives
- Project Seminar Electromobility
- Current Topics of Renewable Energies I and II
- Project Renewable Energy
- Sustainable non-fossil mobility
- Vehicle Simulation & Test Drive

Open list of elective modules (F) (according to § 6 of the regulations of study programme):
- Selected Topics of control engineering
- Power Electronics
- International Accounting
- This list also contains all modules of the list AO.
- Electrical Energy Transmission
- Modelling of Physical Systems
- Human Resources Management

Explanations**:**

CM = Compulsory module, Pflichtmodule

EM = Elective module, Wahlpflichtmodule

*) = One of these two modules must be selected; on request, additional modules from the area of "Interdisciplinary qualification" from other Master's degree courses in the Department of Electrical Engineering and Computer Science can also be selected

6M = 6 months

x + y = Lecture-/exercise hours + laboratory-/seminar hours

The subdivision of the semester week hours (SWH) during lectures / exercises and laboratory / seminar hours is a proposal, which can be varied by the instructor in his / her own direction.

4. In § 8 wird der Absatz 2 wie folgt neu gefasst:

Aus folgenden Pflicht- und Wahlpflichtmodulen setzt sich der Studienplan für den 4-semestrigen Master-Studiengang Renewable Energy and E-Mobility mit Praxissemester zusammen.

Course	Type	1.	2.	3.	4	SWH	ECTS
Mathematical-scientific an technical bases						**8**	**12**
REEMM1100 - Selected Chapters of Mathematics	CM	1+3				4	6
REEMM1300 - System Theory	CM		2+2			4	6
Specialized technical bases of renewable energy						**8**	**12**
REEMM1400 - Renewable Energy Systems	CM	2+2				4	6
REEMM2200 - Methods of Power Engineering	CM		1+3			4	6
Application-oriented profiling, elective modules						**20**	**30**
REEMM2010 - Elective Module (AO) I	EM	4				4	6
REEMM2020 - Elective Module (AO) II	EM		4			4	6
REEMM2030 - Elective Module (AO) III	EM		4			4	6
REEMM2040 - Elective Module (AO) IV	EM		4			4	6
REEMM2060 - Elective Module (F) I	EM	4				4	6
Interdisciplinary qualifications (1 from 2)						**4**	**6**
REEMM3600 - Quality in Automotive Industry	EM *)	0+4				4	6
REEMM3800 - Energy and Environmental Management	EM *)		1+3			4	6
Internship semester	P			21W		**21W**	**30**
Master-Thesis with colloquium	P				6M	**6M**	**30**
Total		**20**	**20**	**5M**	**6M**	**40+11M**	**120**

Open list of elective modules (AO) (according to § 6 of the regulations of study programme):
- Hydrogen Technology
- Solar Systems
- Wind Power Plants
- Advanced Power Electronics
- Vehicle Management Systems
- Control of electrical drives
- Project Seminar Electromobility
- Current Topics of Renewable Energies I and II
- Project Renewable Energy
- Sustainable non-fossil mobility
- Vehicle Simulation & Test Drive

Open list of elective modules (F) (according to § 6 of the regulations of study programme):
- Selected Topics of control engineering
- Power Electronics
- International Accounting
- This list also contains all modules of the list AO.
- Electrical Energy Transmission
- Modelling of Physical Systems
- Human Resources Management

Explanations**:**

CM	=	Compulsory module, Pflichtmodul
EM	=	Elective module, Wahlpflichtmodul
*)	=	One of these two modules must be selected; on request, additional modules from the area of "Interdisciplinary qualification" from other Master's degree courses in the Department of Electrical Engineering and Computer Science can also be selected
21W	=	21 weeks
6M	=	6 months
x + y	=	Lecture-/exercise hours + laboratory-/seminar hours

The subdivision of the semester week hours (SWH) during lectures / exercises and laboratory / seminar hours is a proposal, which can be varied by the instructor in his / her own direction.

5. In § 8 wird nach Absatz 2 ein neuer Absatz 3 eingefügt:

(3) Aus folgenden Pflicht- und Wahlpflichtmodulen setzt sich der Studienplan für den 4-semestrigen Master-Studiengang Renewable Energy and E-Mobility ohne Praxissemester zusammen.

Course	Type	1.	2.	3.	4	SWH	ECTS
Mathematical-scientific an technical bases						**8**	**12**
REEMM1100 - Selected Chapters of Mathematics	CM	1+3				4	6
REEMM1300 - System Theory	CM		2+2			4	6
Specialized technical bases of renewable energy						**8**	**12**
REEMM1400 - Renewable Energy Systems	CM	2+2				4	6
REEMM2200 - Methods of Power Engineering	CM		1+3			4	6
Application-oriented profiling, elective modules						**32**	**48**
REEMM2010 - Elective Module (AO) I	EM	4				4	6
REEMM2020 - Elective Module (AO) II	EM		4			4	6
REEMM2030 - Elective Module (AO) III	EM		4			4	6
REEMM2040 - Elective Module (AO) IV	EM		4			4	6
REEMM2050 - Elective Module (AO) V	EM			4		4	6
REEMM2060- Elective Module (F) I	EM	4				4	6
REEMM2070 - Elective Module (F) II	EM			4		4	6
REEMM2080 - Elective Module (F) III	EM			4		4	6
Interdisciplinary qualifications (1 from 2)						**4**	**6**
REEMM3600 - Quality in Automotive Industry	EM *)	0+4				4	6
REEMM3800 - Energy and Environmental Management	EM *)		1+3			4	6
REEMM4100 Project work	P			360h		**360h**	**12**
Master-Thesis with colloquium	P				6M	**6M**	**30**
Total		**20**	**20**	**12 +360h**	**6M**	**52+6M +360h**	**120**

Open list of elective modules (AO) (according to § 6 of the regulations of study programme):
- Hydrogen Technology
- Solar Systems
- Wind Power Plants
- Advanced Power Electronics
- Vehicle Management Systems
- Control of electrical drives
- Project Seminar Electromobility
- Current Topics of Renewable Energies I and II
- Project Renewable Energy
- Sustainable non-fossil mobility
- Vehicle Simulation & Test Drive

Open list of elective modules (F) (according to § 6 of the regulations of study programme):
- Selected Topics of control engineering
- Power Electronics
- International Accounting
- This list also contains all modules of the list AO.
- Electrical Energy Transmission
- Modelling of Physical Systems
- Human Resources Management

- Also all modules of the list AO

Explanations**:**

CM = Compulsory module, Pflichtmodul

EM = Elective module, Wahlpflichtmodul

*) = One of these two modules must be selected; on request, additional modules from the area of "Interdisciplinary qualification" from other Master's degree courses in the Department of Electrical Engineering and Computer Science can also be selected

6M = 6 months

360h = 360 hours

x + y = Lecture-/exercise hours + laboratory-/seminar hours

The subdivision of the semester week hours (SWH) during lectures / exercises and laboratory / seminar hours is a proposal, which can be varied by the instructor in his / her own direction.

6. In der Anlage 2 "Modulhandbuch" werden folgende Modulbeschreibungen neu gefasst:

Course	**REEMM1300 - System Theory**			Quality/Degree: Master Sc.
	Course, symbol, title	**REEMM1300 - System Theory**		
	Language	English, optional German possible		
Assignment to the curriculum	Programme	Renewable Energy and E-Mobility		
	Semester	2nd semester	Regular semester	2nd semester
	Duration	1 semester	frequency	Annual
			Compulsory / elective	Compulsory
Educational methods/SWH	Methods	Lecture and follow-up course work, exercise		
	Number SWH	0 lectures + 2 exercise + 0 laboratory + 2 seminar		
Work load	Presence study	64 h seminar, exercise, consultation		
	Self-study	116 h preparative and follow-up course work, individual studies, examination preparation		Σ 180 h
ECTS-points		6		
prerequisite according study regulations				
Additional recommended requirements		Basic knowledge in control engineering and physics, Laplace transformation, differential and integral calculus		
Examination procedure		Written exam, 2 h (Klausur, 2 h)		
Learning outcomes		Students should acquire well founded system theoretical knowledge, i.e. describe and analyze dynamic systems as well as apply the methods to SISO and MIMO-systems and to be able to apply their system theory knowledge to problems of communications engineering and control technology		
Content		Description of linear time-invariant systems in the time and frequency domain; Analysis of analogue and time-discrete SISO and MIMO systems in the state space (controllability, observability and stability), state controller and observer design, method for system analysis		
Literature /references		Franklin, G.F.; Powell, J. D.; Emami-Naeini, A.: Feedback Control of Dynamic Systems, Pearson; 7 edition, 2017. Goodwin, G. C.; Graebe F. S.; Salgado, M. E.: Control System Design, , Pearson, 2001.		

	Steffenhagen, B. :Kleine Formelsammlung Regelungstechnik, Carl Hanser Verlag 2010. Further literature will be announced during the course.

Course	**REEMM1400 - Renewable Energy Systems**			Quality/Degree: Master Sc.	
	Course, symbol, title	**REEMM1400 - Renewable Energy Systems**			
	Language	English, optional German possible			
Assignment to the curriculum	Programme	Renewable Energy and E-Mobility			
	Semester	1st semester	Regular semester	2nd semester	
	Duration	1 semester	frequency	Annual	
			compulsory / elective	compulsory	
Educational methods/SWH	Methods	Lecture, exercise and follow-up course work, seminar			
	Number SWH	1 lectures + 2 exercise+ 1 laboratory			
Work load	Presence study	64 h lectures, exercise, seminar, consultation			
	Self-study	116 h preparative and follow-up course work, individual studies, examination preparation			Σ 180 h
ECTS-points		6			
prerequisite according study regulations					
Additional recommended requirements					
Examination procedure		Written exam, 2 h and certificate of laboratory work (Klausur, 2 h und Übungsschein)			
Learning outcomes		The students have acquired knowledge about the technical possibilities and practical implementation problems in the transition from conventional to regenerative decentralized energy supply systems by intensifying their methodological knowledge. They are able to systematically apply the acquired abilities and knowledge in the profession.			
Content		Installation and planning of regenerative energy generators - offshore and onshore technology - energy storage - power grid integration - island grid configuration- intelligent grid protection - grid control and monitoring – frequency stability in distribution networks –- optimization process for decentralized energy management			
Literature /references		Quaschning, V.: Understanding Renewable Energy Systems; Earthscan/Routledge London, 2nd edition 2016. Quaschning, V.: Renewable Energy and Climate Change; John Wiley & Sons, Ltd Chichester, 1st edition 2010. Lund, H.: Renewable Energy Systems, Elsevier, 2nd Edition 2014. Kaltschmitt, M.; Streicher, W.; Wiese, A.: Renewable Energy Technology, Economics and Environment, Springer Verlag, 2007. Further literature will be announced during the course.			

<table>
<tr><td rowspan="3">Course</td><td colspan="3">REEMM2010...2050 - Elective Modules (AO) I to V</td><td>Quality/Degree: Master Sc.</td></tr>
<tr><td>Course, symbol, title</td><td colspan="3">REEMM2010, REEMM2020, REEMM2030, REEMM2040, REEMM2050
Elective Modules I to V</td></tr>
<tr><td>Language</td><td colspan="3">English, optional German possible</td></tr>
<tr><td rowspan="4">Assignment to the curriculum</td><td>Programme</td><td colspan="3">Renewable Energy and E-Mobility</td></tr>
<tr><td>Semester</td><td>1st or 2nd or 3rd semester</td><td>Regular semester</td><td>2nd semester (3S, 4SwP)
3rd semester (4SwoP)</td></tr>
<tr><td>Duration</td><td>1 semester</td><td>frequency</td><td>Annual</td></tr>
<tr><td></td><td></td><td>compulsory / elective</td><td>compulsory</td></tr>
<tr><td rowspan="2">Educational methods/SWH</td><td>Methods</td><td colspan="3">Lecture and follow-up course work, exercise, seminar, laboratory</td></tr>
<tr><td>Number SWH</td><td colspan="3">4</td></tr>
<tr><td rowspan="2">Work load</td><td>Presence study</td><td colspan="2">64 h</td><td rowspan="2">Σ 180 h</td></tr>
<tr><td>Self-study</td><td colspan="2">116 h preparative and follow-up course work, individual studies, examination preparation</td></tr>
<tr><td colspan="2">ECTS-points</td><td colspan="3">6</td></tr>
<tr><td colspan="2">prerequisite according study regulations</td><td colspan="3"></td></tr>
<tr><td colspan="2">Additional recommended requirements</td><td colspan="3"></td></tr>
<tr><td colspan="2">Examination procedure</td><td colspan="3">In accordance with the examination procedure defined for the chosen module in the FPO</td></tr>
<tr><td colspan="2">Learning outcomes</td><td colspan="3">The students acquire complementary skills as well as profound knowledge in the selected fields:
• current topics of renewable energies
• wind power plants
• hydrogen technology
• solar systems
• control of electrical drives
• electro mobility
• advanced power electronics
• sustainable non-fossil mobility
• vehicle simulation
• vehicle management systems
depending on the current range of elective modules and the interests of the students</td></tr>
<tr><td colspan="2">Content</td><td colspan="3">Courses are offered according to §6 of the regulations of study programme or from the above-mentioned topic pool (list of modules (AO) in the appendix). The theme pool is open, which means that the offer can vary from semester to semester.</td></tr>
<tr><td colspan="2">Literature /references</td><td colspan="3">Depending on the offered course</td></tr>
</table>

Course	**Sustainable non-fossil mobility**			Quality/Degree: Master Sc.
	Course, symbol, title	**REEMM3300 – Sustainable non-fossil mobility**		
	Language	English		
Assignment to the curriculum	Programme	Renewable Energy and E-Mobility		
	Semester	1st semester	Regular semester	2nd semester (3S, 4SwP) 3rd semester (4SwoP)
	Duration	1 semester	frequency	Annual
			compulsory / elective	elective
Educational methods/SWH	Methods	Seminar, exercise, laboratory work and follow-up course work		
	Number SWH	0 lectures + 1 exercise + 2 seminar + 1 laboratory		
Work load	Presence study	80 h		
	Self-study	100 h preparative and follow-up course work, individual studies, examination preparation		Σ 180 h
ECTS-points		6		
prerequisite according study regulations				
Additional recommended requirements				
Examination procedure		Written exam, 2 h and certificate of laboratory work (Klausur 2 h und Übungsschein)		
Learning outcomes		The students are able to identify and complete drive chains for mobile applications based on sustainable non-fossil mobility concepts.		
Content		Mobility, society and the environment; sustainable fuel cycles – PtF and biofuel technologies; e-mobility with its main architectures; hydrogen based mobility – drive chains, vehicles and hydrogen production; cleaner mobility with internal combustion engines and turbines; actual examples.		
Literature /references		Larminie, J.; Lowry J.: Electric Vehicle Technology Explained, 2nd Edition, John Wiley 2012, ISBN: 978-1-119-94273-3. Larminie, J.; Dicks, A.: Fuel Cell Systems Explained, 2nd Edition, John Wiley 2003, ISBN 0-471-49026-1 Töpler, J.; Lehmann, J.; Hydrogen and Fuel Cell Technologies and Market Perspectives, Springer 2016. Additional literature is given during the lectures.		

Course	**Project Seminar E-Mobility**			Quality/Degree: Master Sc.
	Course, symbol, title	**REEMM3400 – Project Seminar E-Mobility**		
	Language	English		
Assignment to the curriculum	Programme	Renewable Energy and E-Mobility		
	Semester	2nd semester	Regular	2nd semester

			semester	(3S, 4SwP) 3rd semester (4SwoP)
	Duration	1 semester	frequency	Annual
			compulsory / elective	elective
Educational methods/SWH	Methods	seminar, laboratory work		
	Number SWH	0 lectures + 0 exercise + 2 laboratory + 2 seminar		
Work load	Presence study	64 h seminar, experimental work		
	Self-study	116 h Preparation and follow-up course work, independent study, documentation of the experimental work		Σ 180 h
ECTS-points		6		
prerequisite according study regulations				
Additional recommended requirements		Fundamentals of power electronics and content of the module "Control of Electrical Drives"		
Examination procedure		Experimental work, 90 h (Experimentelle Arbeit 90 h)		
Learning outcomes		The students are aware of fundamental concepts of E-Mobility and possess basic knowledge in the fields of electrical drives, electrical storage technologies and fuel cell technique. They are able to practically apply this knowledge to real vehicles.		
Content		Fundamentals of drive and carrier mechanics, fundamentals of electrical drives, fundamentals of hydrogen and storage technologies (battery and ultra capacitors), practical work on vehicle including sizing and test of single components		
Literature /references		Will be announced during lecture.		

Course	**Advanced Power Electronics**			Quality/Degree: Master Sc.
	Course, symbol, title	**REEMM3500 - Advanced Power Electronics**		
	Language	English		
Assignment to the curriculum	Programme	Renewable Energy and E-Mobility		
	Semester	2nd semester	Regular semester	2nd semester (3S, 4SwP) 3rd semester (4SwoP)
	Duration	1 semester	frequency	Annual
			compulsory / elective	elective
Educational methods/SWH	Methods	Seminar, exercise, laboratory and work follow-up course work		
	Number SWH	0 lectures + 1 exercise + 1 laboratory + 2 seminar		
Work load	Presence study	64 h		
	Self-study	116 h preparative and post-lecture work, individual studies, examination preparation		Σ 180 h

ECTS-points	6
prerequisite according study regulations	
Additional recommended requirements	Fundamentals of power electronics
Examination procedure	Written exam, 2 h and certificate of laboratory work (Klausur 2 h und Übungsschein)
Learning outcomes	The students can distinguish between different DC/DC power converter topologies as part of switched mode power supplies. They can describe in principle basic three phase converter topologies including multiphase variations. The students understand the fundamentals of pulse width modulation and can apply corresponding control algorithms to the most common three phase converter topologies.
Content	Power converter topologies of DC/DC converters for different switched mode power supplies are presented including zero current or voltage switching control schemes. In a succeeding chapter three phase power converters are developed and corresponding multilevel topologies are introduced. As basic pulse width modulation methods for three phase applications space vector and subharmonic modulation methods are explained and finally compared with each other.
Literature /references	Trzynadlowski, A. M.: Introduction to Modern Power Electronics, John Wiley & Sons, 2016. Mohan, N., Undeland, T.M., Robbins, W. P.: Power Electronics: Converters, Applications, and Design, John Wiley & Sons, 2002.

7. In der Anlage 2 "Modulhandbuch" werden folgende Modulbeschreibungen neu hinzugefügt:

Course	**REEMM2060...2080 - Elective Modules (F) I to V**			Quality/Degree: Master Sc.
	Course, symbol, title	**REEMM2060, REEMM2070, REEMM2080 Elective Modules (F) I to III**		
	Language	English, optional German possible		
Assignment to the curriculum	Programme	Renewable Energy and E-Mobility		
	Semester	1st or 3rd semester	Regular semester	2nd semester (3S, 4SwP) 3rd semester (4SwoP)
	Duration	1 semester	frequency	Annual
			compulsory / elective	compulsory
Educational methods/SWH	Methods	Lecture and follow-up course work, exercise, seminar, laboratory		
	Number SWH	4		
Work load	Presence study	64 h		Σ 180 h

	Self-study	116 h preparative and follow-up course work, individual studies, examination preparation	
ECTS-points		6	
prerequisite according study regulations			
Additional recommended requirements			
Examination procedure		In accordance with the examination procedure defined for the chosen module in the FPO.	
Learning outcomes		The students expand their practice-oriented interdisciplinary knowledge in relation to related engineering or economics, deepen their knowledge in the field of electrical engineering or computer science based on their bachelor's degree or deepen their language skills, depending on the current range of elective modules and the interests of the students.	
Content		Courses are offered according to §6 of the regulations of study programme or from the above-mentioned topic pool (list of modules (F) or (AO) in the appendix). The theme pool is open, which means that the offer can vary from semester to semester.	
Literature /references		Depending on the offered course	

Course	**Selected Topics of control engineering**			Quality/Degree: Master Sc.
	Course, symbol, title	**REEMM2110 - Selected Topics of control engineering**		
	Language	English		
Assignment to the curriculum	Programme	Renewable Energy and E-Mobility		
	Semester	1st or 3rd semester	Regular semester	2nd semester (3S, 4SwP) 3rd semester (4SwoP)
	Duration	1 semester	frequency	Annual
			compulsory / elective	elective
Educational methods/SWH	Methods	Lecture and post-lecture work, exercise, laboratory work		
	Number SWH	0 lectures + 1 exercise + 1 laboratory + 2 seminar		
Work load	Presence study	64 h		
	Self-study	116 h preparative and post-lecture work, individual studies, examination preparation		Σ 180 h
ECTS-points		6		
prerequisite according study regulations				
Additional recommended requirements				
Examination procedure		Written exam, 2 h and certificate of laboratory work (Klausur 2 h und Übungsschein)		
Learning outcomes		The students can actively apply the control technology for the		

	analysis and synthesis of systems, single-loop and meshed control loops. The students have advanced knowledge of system analysis and identification as well as controller design. You can analyze and process more complex control tasks. On the basis of laboratory experiments, the engineering approach to the solution of practical tasks in the field of control engineering is promoted. The students can plan their own experiments, carry out their work, document their results and work in a team.
Content	Concepts and presentation forms of controlled systems; Description of linear time-invariant systems in the time and frequency domain, advanced methods for process analysis and characteristic determination on lines, modeling for technical processes. PID control: Principles, modifications, controllers with two degrees of freedom, practical aspects in use (integrator windup, bumpless H / A switching, limited D component), sampling control and digital implementation, Controler design in the time and frequency domain, tuning methods, further control concepts, smith predictor, introduction to nonlinear control, method of harmonic balance, laboratory experiments on the mentioned lecture contents
Literature /references	Franklin, G.F.; Powell, J. D.; Emami-Naeini, A.: Feedback Control of Dynamic Systems, Pearson; 7 edition, 2017. Goodwin, G. C.; Graebe F. S.; Salgado, M. E.: Control System Design, , Pearson, 2001. Steffenhagen, B. :Kleine Formelsammlung Regelungstechnik, Carl Hanser Verlag 2010. Further literature will be announced during the course.

Course	**Electrical Energy Transmission**			Quality/Degree: Master Sc.
	Course, symbol, title	**REEMM2120 –Electrical Energy Transmission**		
	Language	English		
Assignment to the curriculum	Programme	Renewable Energy and E-Mobility		
	Semester	1st or 3rd semester	Regular semester	2nd semester (3S, 4SwP) 3rd semester (4SwoP)
	Duration	1 semester	frequency	Annual
			compulsory / elective	elective
Educational methods/SWH	Methods	seminar, laboratory work		
	Number SWH	0 lectures + 2 exercise + 0 laboratory + 2 seminar		
Work load	Presence study	64 h seminar, experimental work		
	Self-study	116 h Preparation and wrap-up, independent study, documentation of the experimental work		Σ 180 h
ECTS-points		6		
prerequisite according study regulations				

Additional recommended requirements	
Examination procedure	Written exam, 2 h and certificate of laboratory work (Klausur 2 h und Übungsschein)
Learning outcomes	The students are aware of fundamental methods to analytically describe electrical three phase systems for power transmission and electrical drive issues. They are able to practically apply the means of complex calculus to solve problems of balanced three phase systems. Basic electrical machine types are known and corresponding power balances can be calculated.
Content	Complex calculus (single phase system), extension of the complex calculus to balanced three phase systems (per phase equivalent circuit, delta to wye transformation), transformer, induction machine (squirrel cage), synchronous machine (non salient rotor, without reluctance effect)
Literature /references	Nagsarkar, T. K., Sukhija, M. S., "Basic Electrical Engineering", Oxford University Press, ISBN – 10: 0195673921 ISBN – 19: 978 - 0195673920 Bobrow, L. S., "Fundamentals of Electrical Engineering", Oxford University Press, ISBN – 10: 0195105095 ISBN – 19: 978 - 0195105094 Rizzoni, G., "Fundamentals of Electrical Engineering", (4th chapter), online PDF https://www.ece.rice.edu/~dhj/courses/elec241/col10040.pdf

Course	**Power Electronics**			Quality/Degree: Master Sc.	
	Course, symbol, title	**REEMM2130 - Power Electronics**			
	Language	English			
Assignment to the curriculum	Programme	Renewable Energy and E-Mobility			
	Semester	1st or 3rd semester	Regular semester	2nd semester (3S, 4SwP) 3rd semester (4SwoP)	
	Duration	1 semester	frequency	Annual	
			compulsory / elective	elective	
Educational methods/SWH	Methods	Lecture and post-lecture work, exercise, laboratory work			
	Number SWH	0 lectures + 1 exercise + 1 laboratory + 2 seminar			
Work load	Presence study	64 h			
	Self-study	116 h preparative and post-lecture work, individual studies, examination preparation			Σ 180 h
ECTS-points		6			
prerequisite according study regulations					
Additional recommended					

requirements	
Examination procedure	Written exam, 2 h and certificate of laboratory work (Klausur 2 h und Übungsschein)
Learning outcomes	The students can apply the fundamental Fourier analysis and corresponding complex calculus to determine the power flow of periodic signals. They are able to analyse the power flow of simple DC/DC converter topologies. The students can distinguish different power semiconductor devices. Furthermore, principles of current commutation are known. Basic PWM methods of for three phase converter topologies can be applied.
Content	Mean values and Root mean square values of generally periodic signals, Fourier transformation with focus on fundamental extraction, power flow analysis, different power semiconductors (Diode, MOSFET, IGBT, Thyristor), current commutation process, grid commutated converters, basic DC/DC converter topologies, basic self commutated three phase converter topologies, Pulse Width Modulation for three phase converters
Literature /references	Introduction to Modern Power Electronics, John Wiley & Sons, 2016, Trzynadlowski, A. M. Power Electronics: Converters, Applications, and Design, John Wiley & Sons, 2002, Mohan, N., Undeland, T.M., Robbins, W. P.

Course	**Modelling of Physical Systems**			Quality/Degree: Master Sc.
	Course, symbol, title	**REEMM2140 - Modelling of Physical Systems**		
	Language	English		
Assignment to the curriculum	Programme	Renewable Energy and E-Mobility		
	Semester	1st or 3rd semester	Regular semester	2nd semester (3S, 4SwP) 3rd semester (4SwoP)
	Duration	1 semester	frequency	Annual
			compulsory / elective	elective
Educational methods/SWH	Methods	Lecture and post-lecture work, exercise, laboratory work		
	Number SWH	0 lectures + 1 exercise + 1 laboratory + 2 seminar		
Work load	Presence study	64 h		
	Self-study	116 h preparative and post-lecture work, individual studies, examination preparation		Σ 180 h
ECTS-points		6		
prerequisite according study regulations				
Additional recommended requirements				
Examination procedure		Written exam, 2 h and certificate of laboratory work		

	(Klausur 2 h und Übungsschein)
Learning outcomes	The students have deepened their technical knowledge, developed analytical and creative skills for problem solving, and acquired a broad knowledge of methods for system analysis. They master the creative modeling process and are able to abstract from technical problems and to form the appropriate mathematical models. They master the programming system MATLAB / Simulink and can implement the various mathematical description forms of technical systems in simulation models, also verify them and check them for plausibility.
Content	Application of mathematical methods and numerical methods for modeling and simulation of real systems using the MATLAB / Simulink software system: introduction to Matlab / Simulink, description of LTI systems, application of Laplace transformation, consideration of technical systems in the frequency domain, analytical modeling and simulation using different example systems
Literature /references	Franklin, G.F.; Powell, J. D.; Emami-Naeini, A.: Feedback Control of Dynamic Systems, Pearson; 7 edition, 2017. Goodwin, G. C.; Graebe F. S.; Salgado, M. E.: Control System Design, , Pearson, 2001. Steffenhagen, B. :Kleine Formelsammlung Regelungstechnik, Carl Hanser Verlag 2010. Further literature will be announced during the course.

Course	**Control of Electrical Drives**			Quality/Degree: Master Sc.
	Course, symbol, title	**REEMM3700 - Control of Electrical Drives**		
	Language	English		
Assignment to the curriculum	Programme	Renewable Energy and E-Mobility		
	Semester	1st or 3rd semester	Regular semester	2nd semester (3S, 4SwP) 3rd semester (4SwoP)
	Duration	1 semester	frequency	Annual
			compulsory / elective	elective
Educational methods/SWH	Methods	Lecture and post-lecture work, exercise, laboratory work		
	Number SWH	0 lectures + 1 exercise + 1 laboratory + 2 seminar		
Work load	Presence study	64 h		
	Self-study	116 h preparative and post-lecture work, individual studies, examination preparation		Σ 180 h
ECTS-points		6		
prerequisite according study regulations				
Additional recommended requirements		Fundamental of electrical machines and control engineering		
Examination procedure		Written exam, 2 h and certificate of laboratory work		

	(Klausur 2 h und Übungsschein)
Learning outcomes	The students can apply basic speed control methods to electrical drives comprising field oriented stator current control techniques. They are able to implement such control methods to different machine types such as induction and synchronous (reluctance) machines.
Content	Space vector model of various electrical three phase machines. Efficiency optimized field oriented speed control of induction machines as well as synchronous (reluctance) machines, general (sensorless) speed control methods for three phase machines
Literature /references	Advanced Electrical Drives: Analysis, Modeling, Control (Power Systems), Springer, 2010, De Doncker, R. Control of Electrical Drives, Springer, 2001, Leonhard, W.

Course	**Project work**			Quality/Degree: Master Sc.	
	Course, symbol, title	**REEMM4100 - Project work**			
	Language	English			
Assignment to the curriculum	Programme	Renewable Energy and E-Mobility			
	Semester	3rd semester	Regular semester	3rd semester	
	Duration	1 semester	frequency	Annual	
			compulsory / elective	compulsory for 4SwoP	
Educational methods/SWH	Methods	independent scientific work			
	Number SWH	0 lectures + 0 exercise + 1 laboratory + 0 seminar			
Work load	Presence study	0 h			
	Self-study	360 h			Σ 360 h
ECTS-points		12			
prerequisite according study regulations					
Additional recommended requirements					
Examination procedure		Written exam, 2 h			
Learning outcomes		As part of a project work, in addition to technical competence, methodological and personnel skills are acquired. The students acquire the ability to independently work on a larger project, to organize themselves and their projects, and to deal appropriately with criticism and conflicts in a team.			
Content		Topics are issued by the instructors			
Literature /references		Depends on the topic.			

Course	**Human Resources Management**			Quality/Degree: Master Sc.
	Course, symbol, title	**WMSSDM3000 - Human Resources Management**		
	Language	English		
Assignment to the curriculum	Programme	Simulation and System Design Renewable Energy and E-Mobility		
	Semester	1st or 3rd semester	Regular semester	2nd semester (3S, 4SwP) 3rd semester (4SwoP)
	Duration	1 semester	frequency	Annual
			compulsory / elective	elective
Educational methods/SWH	Methods	Seminar-style lecture (Seminaristischer Unterricht)		
	Number SWH	0 lectures + 0 exercise + 0 laboratory + 4 seminar		
Work load	Presence study	64 h		
	Self-study	116 h		Σ 180 h
ECTS-points		6		
prerequisite according study regulations				
Additional recommended requirements				
Examination procedure		Case study incl. presentation 116 hours; for alternative forms of examination see examination regulation (Fallstudie 116 Stunden inklusive Präsentation; alternative Prüfungsleistungen siehe Fachprüfungsordnung SSD)		
Learning outcomes		- Theoretical and empirical understanding of organizational and cultural conditions for HRM in a globalized world and esp. challenges refer to demographic change. - Be able to provide and coordinate HRM activities to solve all tasks performed in an organization with respect to its goals and based on scientific methods and tools.		
Content		- Landscape/ HRM concepts/ Distinction IHRM - Organizational, cultural and societal context - Diversity Management - Intercultural training - Strategic HRM		
Literature /references		Bohlander, G.W.; Snell, S.A. (2012): Principles of Human Resource Management. 16th edition. South Western Learning. Bourdieu, P. (1986): Ökonomisches Kapital, kulturelles Kapital, soziales Kapital. In: Soziale Ungleichheiten (Soziale Welt, Sonderheft 2), edited by Reinhard Kreckel. Goettingen: Otto Schartz & Co.. 1983. pp. 183 -98. The article appears here for the first time in English. Translated by Richard Nice. Hofstede, G. (2001), Culture's Consequence, Thousand Oaks, CA: Sage Publications. Hofstede, G. (2002), "Images of Europe: Past, Present and Future", in: Warner M., Joynt P. (eds), Managing Across Cultures. Padstow: Thompson.		

	Rothlauf, J. (2014): A global view on intercultural management. Oldenbourg

Course	**International Accounting**			Quality/Degree: Master Sc.
	Course, symbol, title	**SSDM3500 - International Accounting**		
	Language	English		
Assignment to the curriculum	Programme	Simulation and System Design Renewable Energy and E-Mobility		
	Semester	1st or 3rd semester	Regular semester	2nd semester (3S, 4SwP) 3rd semester (4SwoP)
	Duration	1 semester	frequency	Annual
			compulsory / elective	elective
Educational methods/SWH	Methods	independent scientific work		
	Number SWH	2 lectures + 2 exercise + 0 laboratory + 0 seminar		
Work load	Presence study	64 h		
	Self-study	116 h		Σ 180 h
ECTS-points		6		
prerequisite according study regulations				
Additional recommended requirements		basic knowledge of accounting practices		
Examination procedure		written exam 120 minutes (Klausur 120 Minuten)		
Learning outcomes		The students get a comprehensive introduction to financial reporting according the International Financial Reporting Standards (IFRS). They learn how the standards are used in the preparation of financial statements. The students understand the underlying concepts of Accounting using IFRS. They are able to solve easy and moderately difficult accounting problems.		
Content		• regulatory framework, • IASB conceptual framework, • financial reporting in practice, e.g. accounting of property, plant and equipment, intangible assets, inventories, long-term production orders, financial instruments, provisions, deferred items • additional instruments of international financial reporting, e.g. cash flow statement, segment reporting		
Literature /references		Harrison, Walter T., Horngreen Charles T., Thomas, C. William, Themin Suwardy: Financial Accounting. International Financial Reporting Standards, Pearson, 9. ed., 2013 Kolitz, David: Financial Accounting. A Concepts-Based Introduction, Routledge, 2016		

	Melville, Alan: International Financial Reporting: A Practical Guide, Pearson, 5. ed., 2015 Weygandt, Jerry J., Kimmel, Paul D., Kieso, Donald E.: Financial Accounting. IFRS Edition, Wiley, 3 ed., 2015

Explanation:

3S = 3-semester variant (3-semestrige Variante)
4SwP = 4-semester variant with internship semester (4-semestrige Variante mit Praxissemester)
4SwoP = 4-semester variant without internship semester (4-semestrige Variante ohne Praxissemester)

8. In den Modulbeschreibungen für die Module REEMM1700, REEMM3000, REEMM3100, REEMM3410, REEMM3420, REEMM3610, REEMM5400, REEMM5500 wird das Feld "Regular Semester" wie folgt geändert:

2nd semester (3S, 4SwP)
3rd semester (4SwoP).

9. In § 1 wird in Satz 1 das Wort “zwei” durch das Wort “drei” ersetzt und nach dem zweiten Anstrich folgender Anstrich hinzugefügt:

“- Master mit einer Regelstudienzeit von vier Fachsemestern ohne integriertes praktisches Studiensemester”

Artikel 2

1. Diese Änderungssatzung tritt am Tag nach ihrer Veröffentlichung auf der Homepage der Hochschule Stralsund in Kraft.

2. Die Änderungen gelten erstmals für Studierende, die im Sommersemester 2018 an der Hochschule Stralsund für den Master-Studiengang Renewable Energy and E-Mobility immatrikuliert wurden. Studierende, die bereits vor dem Sommersemester 2019 immatrikuliert wurden, müssen für das Modul REEMM1400 Renewable Energy Systems jedoch keinen Übungsschein erbringen und die Zugangsvoraussetzungen des § 2 Absatz 6 und 7 der Fachprüfungsordnung nicht erfüllen.

Ausgefertigt aufgrund des Beschlusses des Senats der Hochschule Stralsund vom 25. September 2018 und der Genehmigung der Rektorin vom 19. November 2018.

Stralsund, den 19. November 2018

Die Rektorin
der Hochschule Stralsund
University of Applied Sciences
Prof. Dr.-Ing. Petra Maier

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Hochschule Stralsund

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Veröffentlichungsvermerk:
Diese Satzung wurde am 19. November 2018 auf der Homepage der Hochschule Stralsund veröffentlicht.