

Module Handbook
Master of Science in Management and Engineering in
Electrical Power Systems (M.Sc.)

Modulhandbuch für den Masterstudiengang
Management and Engineering in Electrical Power Systems (M.Sc.)

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Examination Regulations: Management and Engineering in Electrical Power Systems (M.Sc.) [MME in EPS]

Prüfungsordnungsbeschreibung: Management and Engineering in Electrical Power Systems (M.Sc.) [MME in EPS]

Title Titel	M aster of Science in M anagement and E ngineering in Electrical Power Systems
Acronym Kurzbezeichnung	MME in EPS

Compulsory Courses Engineering – RWTH Aachen (Faculty 6 - Electrical Engineering and Information Technology)

Pflichtmodulbereich – Engineering – RWTH Aachen (Fakultät 6 - Elektrotechnik und Informationstechnik)

Module: Electrical Machines

Module Modulbezeichnung	Electrical Machines
Modul level Modulniveau	Master
Code Kürzel	
Subtitle Untertitel	EM1 & EM2
Lecture Lehrveranstaltungen	See list of lectures and examinations of the module
Semester Studiensemester	1 & 2
Person in Charge Modulverantwortliche	Univ.-Prof. Dr.-Ing. Dr.h.c. dr hab. Kay Hameyer
Lecturer Dozenten	Univ.-Prof. Dr.-Ing. Dr.h.c. dr hab. Kay Hameyer
Language Sprache	English
Assignment to the curriculum Zuordnung zum Curriculum	Compulsory Module Engineering
Teaching form Lehrformen	<ul style="list-style-type: none"> • Written Exam (90 min) or • Oral Exam (30min)
Workload Arbeitsaufwand	Total 240 h, Contact hours 90 h, Self-study 150 h
Lecture hours / Contact hours Kontaktzeit (SWS)	6
ECTS-Credit Points (CP) Kreditpunkte	8
Requierments according to examination regulation Voraussetzungen nach Prüfungsordnungen	-none-
Learning Objectives Angestrebte Lernergebnisse	<p>Electrical Machines I</p> <p>After successfully completing this course, the student will have acquired the following learning outcomes:</p> <p><u>Knowledge/Understanding:</u></p> <p>Students</p> <ul style="list-style-type: none"> • have an understanding of the electromagnetic energy conversion • know the topology of the electromagnetic circuit, which is suitable for the energy conversion.

	<ul style="list-style-type: none"> obtain the knowledge of the construction, mode of operation and the stationary operating characteristics of the electrical machines <p><u>Abilities / Skills:</u></p> <p>Students:</p> <ul style="list-style-type: none"> can follow the physical effect of voltage induction and are able to transfer it into practical situations <p>Electrical Machines II</p> <p>After successfully completing this course, the student will have acquired the following learning outcomes:</p> <p><u>Abilities / Skills:</u></p> <p>Students:</p> <ul style="list-style-type: none"> are able to determine the dynamic characteristics of DC, induction and synchronous machines by using the two axis theory are able to describe the dynamic characteristics of a DC, induction and synchronous machines when applying a load thrust are able to evolve and make use of automatic control theory block diagrams of DC, induction and synchronous machines are able to apply different methods of automatic control concerning the different machine types
<p>Content Inhalt</p>	<p>Electrical Machines I</p> <ul style="list-style-type: none"> Transformer: Construction and mode of operation, equivalent circuit diagram, voltage equations, operating behavior, three-phase transformer. DC machine: Structure and method of operation, armature winding, induced voltage, torque, voltage equation, operational behavior as motor and generator (separately excited, shunt excited, permanently excited, series excitation, compound excitation), commutation, armature inductions. Rotating field theory: Structure of a rotary current generator, alternating flux, rotating flux, three-phase ac winding, turns rate, induced voltage, torque, rotary field performance. Asynchronous machine: Equivalent circuit diagram, Calculation of inductances and resistances, Operational behavior, Circle diagram, Technical requirements, Squirrel-cage rotor, Displacement rotor, Rotating speed adjustment, Initial behavior, Asynchronous generator (induction generator) Synchronous machine: Equivalent circuit diagram, Pointer diagram, Turbogenerator, Salient-pole generator, Idling cycle, Sustained short-circuit, Isolated plant, Operation at the rigid network, Permanently excited synchronous machines, Clawpolegenerator, external-pole synchronous generator. Small machines for one-phase operation: Universal motor, Single-phase operation of the three-phase alternating current asynchronous machine, One-phase asynchronous engine operation, Shaded-pole motor. Application and technical design of electrical machines. <p>Electrical Machines II</p> <ul style="list-style-type: none"> Two-axis-theory of three-phase machines: Requirements, transformation from three-phase to two-phase machine, transformation of stator and rotor to a rotating coordinate system, flux interlinking, current-equations, torque, model of direct-current machines, space-vector diagram Dynamic performance of direct-current machines: Alternate diagram and dynamic equations, externally excited direct-current machine, self-excitation, coupled reference input combination for servo-motors with static converter feed, direct-current series motor in pulse operation Asynchronous machine: System of equations, fast starting and maximum load, fieldoriented feedback control with load-independent stator current, static operation with constant stator- and rotor-flux interlinking, fieldoriented feedback control with load-independent stator-current Synchronous machine: Static operation of full-pole machines, maximum short-circuit current, two-axis-theory of salient pole machines, static operation of the salient pole machine, determination of X_d and X_q, maximum short-circuit current of the salient pole machine, transient operation of the salient pole machine
<p>Media Medienform</p>	<p>e-Learning L²P, Power Point</p>
<p>Literature Literatur</p>	<p>Lecture Notes Students also receive a list of relevant literature</p>

Lectures / Examinations Studien-/Prüfungsleistungen						
Title Titel	Code Kürzel	ECTS Kredit- punkte	Workload Arbeits- aufwand (h)	Lecture H. Kontakt- zeit (h)	Self-Study Selbst- studium (h)	Duration of Exam Prüfungs- dauer (min)
Examination (Prüfung): EM1		4	0	0	0	90 (Written Exam) or 20 (Oral Exam)
Examination (Prüfung): EM2		4	0	0	0	90 (Written Exam) or 20 (Oral Exam)
Lecture (Vorlesung) and Exercise (Übung): EM1		0	120	45	75	0
Lecture (Vorlesung) and Exercise (Übung): EM2		0	120	45	75	0
Teaching Unit / Examinations: Examination Electrical Machines I Studien-/Prüfungsleistung: Prüfung Electrical Machines I						
Title Titel	Examination Electrical Machines I					
Sub-title Untertitel	Exa EM1					
Semester Studiensemester	1					
Connection to the curriculum Curriculare Verankerung	Compulsory module (variable to the semester)					
Teaching Unit / Examinations: Examination Electrical Machines II Studien-/Prüfungsleistung: Prüfung Electrical Machines II						
Title Titel	Examination Electrical Machines II					
Sub-title Untertitel	Exa EM1					
Semester Studiensemester	2					
Connection to the curriculum Curriculare Verankerung	Compulsory module (variable to the semester)					
Teaching Unit / Examinations: Lecture and Exercise Electrical Machines I Studien-/Prüfungsleistung: Vorlesung und Übung Electrical Machines I						
Title Titel	Lecture and Exercise Electrical Machines I					
Sub-title Untertitel	L&E EM1					
Semester Studiensemester	1					
Connection to the curriculum Curriculare Verankerung	Compulsory module (variable to the semester)					
Teaching Unit / Examinations: Lecture and Exercise Electrical Machines II Studien-/Prüfungsleistung: Lecture und Übung Electrical Machines II						

Title Titel	Lecture and Exercise Electrical Machines II
Sub-title Untertitel	L&E EM2
Semester Studiensemester	2
Connection to the curriculum Curriculare Verankerung	Compulsory module (variable to the semester)

Module: High Voltage Engineering

Module Modulbezeichnung	High Voltage Engineering
Modul level Modulniveau	Master
Code Kürzel	
Subtitle Untertitel	HVE
Lecture Lehrveranstaltungen	See list of lectures and examinations of the module
Semester Studiensemester	1 & 2
Person in Charge Modulverantwortliche	Univ.-Prof. Dr.-Ing. Armin Schnettler
Lecturer Dozenten	Univ.-Prof. Dr.-Ing. Armin Schnettler
Language Sprache	English
Assignment to the curriculum Zuordnung zum Curriculum	Compulsory Module Engineering
Teaching form Lehrformen	<ul style="list-style-type: none"> • Written Exam (90 min) or • Oral Exam (30min)
Workload Arbeitsaufwand	Total 240 h, Contact hours 90 h, Self-study 150 h
Lecture hours / Contact hours Kontaktzeit (SWS)	6
ECTS-Credit Points (CP) Kreditpunkte	8
Requierments according to examination regulation Voraussetzungen nach Prüfungsordnungen	-none-
Learning Objectives Angestrebte Lernergebnisse	<p>High Voltage Engineering</p> <p>Testing Systems and Diagnostics</p> <p>The students obtain deep knowledge concerning the measurement of high voltages. This includes the selection of different voltage divider types for different high voltage shapes, e.g. DC or impulse voltages as well as the assessment of measurement errors.</p> <p>After successfully completing this course, the student will have acquired the following learning outcomes:</p> <p><u>Knowledge/Understanding:</u></p> <p>Students:</p> <ul style="list-style-type: none"> • understand the background of high voltage measuring techniques and diagnosis. • understand the monitoring of high voltage transformers and are able to assess the influence of the monitoring results on the reliability of the equipment. <p><u>Abilities / Skills:</u></p> <p>Students:</p>

	<ul style="list-style-type: none"> • are able to perform measurements and diagnostics related to problem statements in the field of high voltage systems considering error sources and insecurities based on the obtained knowledge. • are able to design high voltage systems for the generation of high AC, DC or impulse voltages. • are able to calculate the elements for a Low Voltage Ride Through test system and how to simulate different failure cases occurring in the grid with this test system. • are able to design measurement equipment for high currents. • are able to understand and apply measurements principles of partial discharge measurements and ultrasound diagnosis. • are able to set up the measuring circuits and to evaluate the measurement results. • are able to consider electromagnetic inference between electronic devices and corresponding countermeasures. <p>High Voltage Engineering Insulation Systems</p> <p>The students obtain knowledge coming along with the breakdown mechanisms in vacuum as well as solid and liquid insulation materials and about the design of production systems for insulation materials.</p> <p>After successfully completing this course, the student will have acquired the following learning outcomes:</p> <p><u>Knowledge/Understanding:</u></p> <p>Students:</p> <ul style="list-style-type: none"> • understand the background of high voltage insulations systems. • understand the reasons for the occurrence of overvoltages in high voltage systems. This includes external overvoltages e.g. caused by lightning strokes and internal overvoltages which occur e.g. during switching operations. • understand the basics of overvoltage protection, surge arresters and their design. • understand breakdown processes and the specific advantages and disadvantages of different insulation materials. <p><u>Abilities / Skills:</u></p> <p>Students are able:</p> <ul style="list-style-type: none"> • to comprehend problem statements in high voltage engineering and • to design components and insulation systems based on the obtained knowledge about the relevant physical processes. • to basically set up a design for surge arresters for specific applications. • to consider the effects of high voltages on the properties of insulation materials. • to consider the physical background of gas discharges • to calculate the breakdown voltage and to decide which test voltage should be applied to test components dependent on different breakdown mechanisms. • to select the optimal insulating medium depending on the high voltage application. • to assess the influence of interfaces on the insulation coordination during the construction of high voltage equipment as well as the evaluation of the ageing of the insulation materials.
<p>Content Inhalt</p>	<p>High Voltage Engineering Testing Systems and Diagnostics</p> <ul style="list-style-type: none"> • Introduction: Testing and Diagnosis • Special test circuits: High voltages (AC and DC), high currents, high power, LVRT (low voltage ride through) • Measurements: Measurement theory - Measurement of high voltages and currents - Special requirements in HV engineering • Partial Discharges: Classification, measurement, impact • Ultrasound diagnosis: Theory, technology, applications • Monitoring • Electromagnetic Compatibility (EMC) <p>High Voltage Engineering Insulation Systems</p>

	<ul style="list-style-type: none"> • Overvoltages in high voltage installations • External overvoltages • Internal overvoltages • Overvoltage protection • Insulation Systems • Materials, their electrical breakdown and arcs - Gases: gas discharge, arcs - Vacuum: breakdown, arcs - Liquids - Solids - Interfaces • Insulation systems and their applications • Production of insulation systems • Characteristics and testing • Ageing • Construction of High Voltage Equipment 					
Media Medienform	e-Learning L ² P, Power Point					
Literature Literatur	Lecture Notes Students also receive a list of relevant literature					
Lectures / Examinations Studien-/Prüfungsleistungen						
Title Titel	Code Kürzel	ECTS Kredit- punkte	Workload Arbeits- aufwand (h)	Lecture H. Kontakt- zeit (h)	Self-Study Selbst- studium (h)	Duration of Exam Prüfungs- dauer (min)
Examination (Prüfung): HVE-TSD		4	0	0	0	90 (Written Exam) or 30 (Oral Exam)
Examination (Prüfung): HVE-IS		4	0	0	0	90 (Written Exam) or 30 (Oral Exam)
Lecture (Vorlesung) and Exercise (Übung): HVE-TSD		0	120	45	75	0
Lecture (Vorlesung) and Exercise (Übung): HVE-IS		0	120	45	75	0
Teaching Unit / Examinations: Examination High Voltage Engineering - Testing Systems and Diagnostics Studien-/Prüfungsleistung: Prüfung High Voltage Engineering - Testing Systems and Diagnostics						
Title Titel	Examination High Voltage Engineering - Testing Systems and Diagnostics					
Sub-title Untertitel	Exa HVE-TSD					
Semester Studiensemester	1					
Connection to the curriculum Curriculare Verankerung	Compulsory module (variable to the semester)					
Teaching Unit / Examinations: Examination High Voltage Engineering - Insulation Systems Studien-/Prüfungsleistung: Prüfung High Voltage Engineering - Insulation Systems						
Title Titel	Examination High Voltage Engineering - Insulation Systems					
Sub-title Untertitel	Exa HVE-IS					
Semester Studiensemester	2					

Connection to the curriculum Curriculare Verankerung	Compulsory module (variable to the semester)
Teaching Unit / Examinations: Lecture and Exercise High Voltage Engineering - Testing Systems and Diagnostics Studien-/Prüfungsleistung: Vorlesung und Übung High Voltage Engineering - Testing Systems and Diagnostics	
Title Titel	Lecture and Exercise High Voltage Engineering - Testing Systems and Diagnostics
Sub-title Untertitel	L&E HVE-TSD
Semester Studiensemester	1
Connection to the curriculum Curriculare Verankerung	Compulsory module (variable to the semester)
Teaching Unit / Examinations: Lecture and Exercise High Voltage Engineering - Insulation Systems Studien-/Prüfungsleistung: Vorlesung und Übung High Voltage Engineering - Insulation Systems	
Title Titel	Lecture and Exercise High Voltage Engineering - Insulation Systems
Sub-title Untertitel	L&E HVE-IS
Semester Studiensemester	2
Connection to the curriculum Curriculare Verankerung	Compulsory module (variable to the semester)

Module: Automation of Complex Power Systems

Module Modulbezeichnung	Automation of Complex Power Systems
Modul level Modulniveau	Master
Code Kürzel	
Subtitle Untertitel	CPS
Lecture Lehrveranstaltungen	See list of lectures and examinations of the module
Semester Studiensemester	2
Person in Charge Modulverantwortliche	Univ.-Prof. Antonello Monti, Ph. D.
Lecturer Dozenten	Univ.-Prof. Antonello Monti, Ph. D.
Language Sprache	English
Assignment to the curriculum Zuordnung zum Curriculum	Compulsory Module Engineering
Teaching form Lehrformen	<p>Automation of Complex Power Systems</p> <ul style="list-style-type: none"> • Written Exam (90 min) or • Oral Exam (30min) <p>Automation, Simulation and Measurement in Complex Power Systems</p> <ul style="list-style-type: none"> • Oral presentation (10-15 min) • Report (5-8 pages)
Workload Arbeitsaufwand	Total 180 h, Contact hours 75 h, Self-study 105 h
Lecture hours / Contact hours Kontaktzeit (SWS)	5
ECTS-Credit Points (CP) Kreditpunkte	6
Requierments according to examination regulation Voraussetzungen nach Prüfungsordnungen	-none-
Learning Objectives Angestrebte Lernergebnisse	<p>Automation of Complex Power Systems</p> <p>After successfully completing this course, the student will have acquired the following learning outcomes:</p> <p><u>Knowledge/Understanding:</u></p> <p>Students</p> <ul style="list-style-type: none"> • understand and apply the fundamentals of protection systems and their automation • understand and implement the possible feedback control structure for distribution automation

	<u>Abilities / Skills:</u> Students are able: <ul style="list-style-type: none"> to comprehend and apply the basics of power system automation to determine the implication of automation in a distributed generation environment to characterize and classify the most important standards for power system automation 					
Content Inhalt	Automation of Complex Power Systems <ul style="list-style-type: none"> Distribution Automation: prerequisite and historical perspective Distribution Automation and Control Function System Protections and Protection Automation Closed Loop Control in Power System Automation Control of Distributed Energy Sources Microgrids and Microgrid Control Standards for Distribution Automation Common Information Model Communication Systems for Power Systems Integration of renewable Energy Sources 					
Media Medienform	e-Learning L ² P, Power Point					
Literature Literatur	Lecture Notes Students also receive a list of relevant literature					
Lectures / Examinations Studien-/Prüfungsleistungen						
Title Titel	Code Kürzel	ECTS Kreditpunkte	Workload Arbeitsaufwand (h)	Lecture H. Kontaktzeit (h)	Self-Study Selbststudium (h)	Duration of Exam Prüfungsdauer (min)
Examination (Prüfung): CPS		4	0	0	0	90 (Written Exam) or 30 (Oral Exam)
Examination (Prüfung): CPS-S		2	0	0	0	Oral Presentation (10-15 min), Report (5-8 pages)
Lecture (Vorlesung) and Exercise (Übung): CPS		0	120	45	75	0
Practical Session (Praktikum): CPS-S		0	60	30	30	0
Teaching Unit / Examinations: Examination Automation of Complex Power Systems Studien-/Prüfungsleistung: Prüfung Automation of Complex Power Systems						
Title Titel	Examination Automation of Complex Power Systems					
Sub-title Untertitel	Exa CPS					
Semester Studiensemester	2					
Connection to the curriculum Curriculare Verankerung	Compulsory module (variable to the semester)					
Teaching Unit / Examinations: Examination Automation, Simulation and Measurement in Complex Power Systems Studien-/Prüfungsleistung: Prüfung Automation, Simulation and Measurement in Complex Power Systems						
Title Titel	Examination Automation, Simulation and Measurement in Complex Power Systems					

Sub-title Untertitel	Exa CPS-S
Semester Studiensemester	2
Connection to the curriculum Curriculare Verankerung	Compulsory module (variable to the semester)
Teaching Unit / Examinations: Lecture and Exercise Automation of Complex Power Systems Studien-/Prüfungsleistung: Vorlesung und Übung Automation of Complex Power Systems	
Title Titel	Lecture and Exercise Automation of Complex Power Systems
Sub-title Untertitel	L&E CPS
Semester Studiensemester	2
Connection to the curriculum Curriculare Verankerung	Compulsory module (variable to the semester)
Teaching Unit / Examinations: Practical Exercise Automation, Simulation and Measurement in Complex Power Systems Studien-/Prüfungsleistung: Praktikum Automation, Simulation and Measurement in Complex Power Systems	
Title Titel	Practical Session Automation, Simulation and Measurement in Complex Power Systems
Sub-title Untertitel	P CPS-S
Semester Studiensemester	2
Connection to the curriculum Curriculare Verankerung	Compulsory module (variable to the semester)

Module: Battery Storage Systems

Module Modulbezeichnung	Battery Storage Systems
Modul level Modulniveau	Master
Code Kürzel	BSS
Subtitle Untertitel	BSS
Lecture Lehrveranstaltungen	See list of lectures and examinations of the module Siehe Liste der Prüfungsleistungen des Moduls
Semester Studiensemester	1 & 2
Person in Charge Modulverantwortliche	Univ.-Prof. Dr. rer. nat. Dirk Uwe Sauer
Lecturer Dozenten	Univ.-Prof. Dr. rer. nat. Dirk Uwe Sauer
Language Sprache	English
Assignment to the curriculum Zuordnung zum Curriculum	Compulsory Module Engineering
Teaching form Lehrformen	<ul style="list-style-type: none"> • 90 (Written Exam) or • 25 (Presentation)
Workload Arbeitsaufwand	Total 150 h, Contact hours 60 h, Self-study 90 h
Lecture hours / Contact hours Kontaktzeit (SWS)	5
ECTS-Credit Points (CP) Kreditpunkte	5
Requierments according to examination regulation Voraussetzungen nach Prüfungsordnungen	-none-
Learning Objectives Angestrebte Lernergebnisse	<p>Battery Storage Systems</p> <p>This module gives a fundamental understanding for rechargeable batteries and supercaps. After successfully completing this course, the student will have acquired the following learning outcomes:</p> <p><u>Knowledge/Understanding:</u></p> <p>Students</p> <ul style="list-style-type: none"> • understand and apply basic principles of thermodynamics and kinetics of batteries. • understand the fundamental electrochemical processes in batteries. • understand the basic configuration of batteries and evaluate safety and electrical performance characteristics. • understand essential differences between lithium-ion batteries, lead-acid batteries and supercaps. <p><u>Abilities / Skills:</u></p> <p>Students are able:</p>

	<ul style="list-style-type: none"> • to evaluate different battery technologies. • to calculate theoretical and practical energy density of batteries. • to apply different approaches to modeling. • to implement methods of battery diagnostics and modeling. • to find an appropriate battery technology for a certain application and develop the battery pack design. • to develop system solutions in group work • give a speech about technical subjects <p>Battery Storage Systems – selected Laboratory Exercises</p> <p>After successfully completing this course, the student will have acquired the following learning outcomes:</p> <p><u>Knowledge/Understanding:</u></p> <p>Students</p> <ul style="list-style-type: none"> • understand the typical electrical and electro-chemical behavior of batteries • understand the design of batteries and the impact of the design on the performance • basics of battery modeling • basics of life cycle analysis for batteries <p><u>Abilities / Skills:</u></p> <p>Students are able to handle several typical laboratory test devices for battery system design, analysis and characterization.</p>
<p>Content Inhalt</p>	<p>Battery Storage Systems</p> <ul style="list-style-type: none"> • Determination of open circuit voltage via thermodynamic equations • Kinetics of batteries: ohmic resistances, butler-volmer equation, diffusion • Basic concepts of battery storage systems technology • Lithium-ion batteries, lead-acid batteries and supercaps technology in detail: basic electrochemical setup and used materials, safety of different materials, electrical properties, current- and temperature dependencies, typical aging processes, charging and discharging behavior, deduction of appropriate battery management strategies, necessary components of battery management systems • System technical elements of battery packs: Design of chargers and charging method, Cell balancing systems, Thermal management, Modeling approaches, Basic algorithms for battery diagnostics, Protection of battery packs, Total integration of battery cells in battery packs • Approaches to accelerated lifetime tests • Training of presentation techniques <p>Battery Storage Systems – selected Laboratory Exercises</p> <p># 1: Gasing and acid density of lead-acid batteries</p> <p># 2: Impedance spectroscopy and modelling of lead-acid batteries</p> <p># 3: Discharge characteristic of batteries</p> <p># 4: Diagnostics and balancing of Supercaps</p> <p># 5: Load profiles of busses and electric vehicles</p> <p># 6: Electrochemical basics</p> <p># 7: Basic design of a battery cell</p> <p># 8: Modelling of Lithium-ion batteries</p> <p># 9: Fuel cells</p> <p># 10: Life Cycle Analysis</p>
<p>Media Medienform</p>	<p>e-Learning L²P, Power Point</p>

Literature Literatur	Lecture Notes Students also receive a list of relevant literature					
Lectures / Examinations Studien-/Prüfungsleistungen						
Title Titel	Code Kürzel	ECTS Kredit- punkte	Workload Arbeits- aufwand (h)	Lecture H. Kontakt- zeit (h)	Self-Study Selbst- studium (h)	Duration of Exam Prüfungs- dauer (min)
Examination (Prüfung): BSS		4	0	0	0	90 (Written Exam) or 25 (Presentation)
Examination (Prüfung): BSS-LE		1	0	0	0	4 Protocols of Laboratory Exercises (6-10 pages)
Lecture (Vorlesung) and Exercise (Übung): BSS		0	120	45	75	0
Practical Session (Praktikum): BSS-LE		0	30	15	15	0
Teaching Unit / Examinations: Examination Battery Storage Systems Studien-/Prüfungsleistung: Prüfung Battery Storage Systems						
Title Titel	Examination Battery Storage Systems					
Sub-title Untertitel	Exa BSS					
Semester Studiensemester	1					
Connection to the curriculum Curriculare Verankerung	Compulsory module (variable to the semester)					
Teaching Unit / Examinations: Examination Battery Storage Systems – selected Laboratory Exercises Studien-/Prüfungsleistung: Prüfung Battery Storage Systems – selected Laboratory Exercises						
Title Titel	Examination Battery Storage Systems – selected Laboratory Exercises					
Sub-title Untertitel	Exa BSS-LE					
Semester Studiensemester	2					
Connection to the curriculum Curriculare Verankerung	Compulsory module (variable to the semester)					
Teaching Unit / Examinations: Lecture and Exercise Battery Storage Systems Studien-/Prüfungsleistung: Vorlesung und Übung Battery Storage Systems						
Title Titel	Lecture and Exercise Battery Storage Systems					
Sub-title Untertitel	L&E BSS					
Semester Studiensemester	1					

Connection to the curriculum Curriculare Verankerung	Compulsory module (variable to the semester)
Teaching Unit / Examinations: Practical Exercise Battery Storage Systems – selected Laboratory Exercises Studien-/Prüfungsleistung: Praktikum Battery Storage Systems – selected Laboratory Exercises	
Title Titel	Practical Exercise Battery Storage Systems – selected Laboratory Exercises
Sub-title Untertitel	P BSS-LE
Semester Studiensemester	2
Connection to the curriculum Curriculare Verankerung	Compulsory module (variable to the semester)

Module: Power Electronics

Module Modulbezeichnung	Power Electronics
Modul level Modulniveau	Master
Code Kürzel	
Subtitle Untertitel	PE
Lecture Lehrveranstaltungen	See list of lectures and examinations of the module
Semester Studiensemester	1
Person in Charge Modulverantwortliche	Univ.-Prof. Dr.ir. Dr.h.c. Rik W. De Doncker
Lecturer Dozenten	Univ.-Prof. Dr.ir. Dr.h.c. Rik W. De Doncker
Language Sprache	English
Assignment to the curriculum Zuordnung zum Curriculum	Compulsory Module Engineering
Teaching form Lehrformen	<p>Power Electronics</p> <ul style="list-style-type: none"> • Written Exam (90 min) or • Oral Exam (30 min) <p>Power Electronics Project</p> <ul style="list-style-type: none"> • Report (About 10 pages)
Workload Arbeitsaufwand	Total 150 h, Contact hours 55 h, Self-study 95 h
Lecture hours / Contact hours Kontaktzeit (SWS)	3
ECTS-Credit Points (CP) Kreditpunkte	5
Requierments according to examination regulation Voraussetzungen nach Prüfungsordnungen	-none-
Learning Objectives Angestrebte Lernergebnisse	<p>Power Electronics - Fundamentals, Topologies, Analysis</p> <p>After successfully completing this course, the student will have acquired the following learning outcomes:</p> <p><u>Knowledge/Understanding:</u> Students</p> <ul style="list-style-type: none"> • understand topologies for power electronic applications <p><u>Abilities / Skills:</u> Students are able:</p> <ul style="list-style-type: none"> • Understand the working principle of different power converters.

	<ul style="list-style-type: none"> Analyze the dynamic behavior of components and circuits, and their basic control concepts. Design/ size main component in a power conversion system. <p>Power Electronics Project After successfully completing this project, the student will have acquired the following learning outcomes:</p> <p><u>Knowledge/Understanding:</u> Students</p> <ul style="list-style-type: none"> to transform their theoretical knowledge on power electronics through the example of a buck converter into an experimental set-up <p><u>Abilities / Skills:</u> Students are able:</p> <ul style="list-style-type: none"> To design, simulate and construct dc-dc converters To perform tests of power electronic converters and assess the performance To analyze the operational characteristics of power electronic converters considering real-life phenomena <p>To accurately describe the findings from simulations and measurements in a brief scientific report</p>					
Content Inhalt	<p>Power Electronics - Fundamentals, Topologies, Analysis Power electronic converters perform the conversion of electrical energy with high efficiency. The course focuses on the following aspects of converter design:</p> <ul style="list-style-type: none"> Semiconductors and analysis Line-Commutated converters Inductor and transformer analysis Design, control and modulation of dc-dc converters Self-commutated converters Pulse width modulation <p>Power Electronics Project The power electronics project covers the following aspects:</p> <ul style="list-style-type: none"> Operation principle of a buck converter Simulation of a line-commutated B6C converter and a buck converter Practical design and construction of a buck converter and converter inductance Validation through measurement <p>Students write a report on the design procedure, measurements and simulations and hand in their simulation models</p>					
Media Medienform	e-Learning L ² P, Power Point					
Literature Literatur	Lecture Notes Students also receive a list of relevant literature					
Lectures / Examinations Studien-/Prüfungsleistungen						
Title Titel	Code Kürzel	ECTS Kredit- punkte	Workload Arbeits- aufwand (h)	Lecture H. Kontakt- zeit (h)	Self-Study Selbst- studium (h)	Duration of Exam Prüfungs- dauer (min)
Examination (Prüfung): PS-FTA		4	0	0	0	90 (Written Exam) or

						30 (Oral Exam)
Examination (Prüfung): PS-P		1	0	0	0	Report (about 10 pages)
Lecture (Vorlesung) and Exercise (Übung): PS-FTA		0	120	45	75	0
Practical Session and Simulation (Praktikum): PS-P		0	30	10	20	0
Teaching Unit / Examinations: Examination Power Electronics – Fundamentals, Topologies, Analysis Studien-/Prüfungsleistung: Prüfung Examination Power Electronics – Fundamentals, Topologies, Analysis						
Title Titel	Examination Power Electronics – Fundamentals, Topologies, Analysis					
Sub-title Untertitel	Exa PE-FTA					
Semester Studiensemester	1					
Connection to the curriculum Curriculare Verankerung	Compulsory module (variable to the semester)					
Teaching Unit / Examinations: Examination Power Electronics – Project Studien-/Prüfungsleistung: Prüfung Power Electronics – Project						
Title Titel	Examination Power Electronics – Project					
Sub-title Untertitel	Exa PE-LE					
Semester Studiensemester	1					
Connection to the curriculum Curriculare Verankerung	Compulsory module (variable to the semester)					
Teaching Unit / Examinations: Lecture and Exercise Power Electronics – Fundamentals, Topologies, Analysis Studien-/Prüfungsleistung: Vorlesung und Übung Power Electronics – Fundamentals, Topologies, Analysis						
Title Titel	Lecture and Exercise Power Electronics – Fundamentals, Topologies, Analysis					
Sub-title Untertitel	L&E PE-FTA					
Semester Studiensemester	1					
Connection to the curriculum Curriculare Verankerung	Compulsory module (variable to the semester)					
Teaching Unit / Examinations: Practical Exercise and Simulation Power Electronics – Project Studien-/Prüfungsleistung: Praktikum Power Electronics – Project						
Title Titel	Practical Exercise and Simulation Power Electronics – Project					
Sub-title Untertitel	P PE-P					
Semester Studiensemester	1					
Connection to the curriculum	Compulsory module (variable to the semester)					

Curriculare Verankerung	
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Module: Power Systems

Module Modulbezeichnung	Power Systems
Modul level Modulniveau	Master
Code Kürzel	
Subtitle Untertitel	PS
Lecture Lehrveranstaltungen	See list of lectures and examinations of the module
Semester Studiensemester	2
Person in Charge Modulverantwortliche	Univ.-Prof. Dr.-Ing. Albert Moser
Lecturer Dozenten	Univ.-Prof. Dr.-Ing. Albert Moser Jan Kellermann Hengsi Chen
Language Sprache	English Englisch
Assignment to the curriculum Zuordnung zum Curriculum	Compulsory Module Engineering
Teaching form Lehrformen	<ul style="list-style-type: none"> • Written Exam (90 min) and • Oral Exam (30min)
Workload Arbeitsaufwand	Total 240 h, Contact hours 90 h, Self-study 150 h
Lecture hours / Contact hours Kontaktzeit (SWS)	6
ECTS-Credit Points (CP) Kreditpunkte	8
Requierments according to examination regulation Voraussetzungen nach Prüfungsordnungen	-none-
Learning Objectives Angestrebte Lernergebnisse	<p>Faults and Stability in Power Systems</p> <p>After successfully completing this course, the student will have acquired the following learning outcomes:</p> <p><u>Knowledge/Understanding:</u> Students</p> <ul style="list-style-type: none"> • know the behavior of power systems under fault conditions • know the quality of supply networks • understand interactions between electrical systems and their environment <p><u>Abilities / Skills:</u></p>

	<p>Students are able:</p> <ul style="list-style-type: none"> to derive unsymmetrical models of power systems to analyze and to calculate unsymmetrical faults in power systems to assess the interference between different electrical systems <p>Power Economics in the Liberalised Electricity Markets</p> <p>After successfully completing this course, the student will have acquired the following learning outcomes:</p> <p><u>Knowledge/Understanding:</u></p> <p>Students</p> <ul style="list-style-type: none"> understand the cost structure of energy supply companies understand motivation and design of the liberalisation process of electricity markets understand different market roles in service and competitive markets, such as price formation in liberalised electricity markets <p><u>Abilities / Skills:</u></p> <p>Students are able:</p> <ul style="list-style-type: none"> to evaluate and explain the quantitative and qualitative cost structures in generation, transmission and distribution to analyze and assess international examples of liberalisation policies to assess international liberalisation approaches. 					
Content Inhalt	<p>Faults and Stability in Power Systems</p> <ul style="list-style-type: none"> 012 Models of Symmetric Installations 012 Models of Asymmetric Faults in Power Systems Asymmetric Short-circuit Current Calculation Neutral Point Handling Interference Dynamic Behaviour of Electricity Supply Systems System Stability <p>Power Economics in the Liberalised Electricity Markets</p> <p>After an introduction in the basics of Power Economics the changed framework in the energy market since beginning of the liberalisation are examined. One emphasis lies on the study of the motives and implementation of liberalisation approaches in international examples. Another key aspect is the detailed view of the roles of the different participants as well as the price formation in liberalised electricity markets.</p> <p>The following contents are part of the lecture</p> <ul style="list-style-type: none"> Basics of Power Economics Motivation and design of the liberalisation, international examples of the liberalisation processes as well as market roles in service and competitive markets Price formation in liberalised markets Conclusions and experiences with different liberalisation approaches 					
Media Medienform	e-Learning L ² P, Power Point					
Literature Literatur	Lecture Notes Students also receive a list of relevant literature					
Lectures / Examinations Studien-/Prüfungsleistungen						
Title Titel	Code Kürzel	ECTS Kredit- punkte	Workload Arbeits- aufwand (h)	Lecture H. Kontakt- zeit (h)	Self-Study Selbst- studium (h)	Duration of Exam Prüfungs- dauer (min)

Examination (Prüfung): PS-FS		4	0	0	0	90 (Written Exam)
Examination (Prüfung): PS-PELM		4	0	0	0	30 (Oral Exam)
Lecture (Vorlesung) and Exercise (Übung): FS-PS		0	120	45	75	0
Lecture (Vorlesung) and Exercise (Übung): PE-LEM		0	120	45	75	0
Teaching Unit / Examinations: Examination Faults and Stability in Power Systems Studien-/Prüfungsleistung: Prüfung Faults and Stability in Power Systems						
Title Titel	Faults and Stability in Power Systems					
Sub-title Untertitel	Exa PS-FS					
Semester Studiensemester	2					
Connection to the curriculum Curriculare Verankerung	Compulsory module (variable to the semester)					
Teaching Unit / Examinations: Examination Power Economics in the Liberalised Electricity Markets Studien-/Prüfungsleistung: Prüfung Power Economics in the Liberalised Electricity Markets						
Title Titel	Examination Power Economics in the Liberalised Electricity Markets					
Sub-title Untertitel	Exa PS-PELM					
Semester Studiensemester	2					
Connection to the curriculum Curriculare Verankerung	Compulsory module (variable to the semester)					
Teaching Unit / Examinations: Lecture and Exercise Faults and Stability in Power Systems Studien-/Prüfungsleistung: Vorlesung und Übung Faults and Stability in Power Systems						
Title Titel	Lecture and Exercise Faults and Stability in Power Systems					
Sub-title Untertitel	L&P PS-FS					
Semester Studiensemester	2					
Connection to the curriculum Curriculare Verankerung	Compulsory module (variable to the semester)					
Teaching Unit / Examinations: Lecture and Exercise Power Economics in the Liberalised Electricity Markets Studien-/Prüfungsleistung: Vorlesung und Übung Power Economics in the Liberalised Electricity Markets						
Title Titel	Lecture and Exercise Power Economics in the Liberalised Electricity Markets					
Sub-title Untertitel	L&P PS-PELM					
Semester Studiensemester	2					
Connection to the curriculum Curriculare Verankerung	Compulsory module (variable to the semester)					

Module: Laboratory Exercise on “Power Engineering”

Module Modulbezeichnung	Laboratory Exercise on “Power Engineering”
Modul level Modulniveau	Master
Code Kürzel	
Subtitle Untertitel	LE-PE
Lecture Lehrveranstaltungen	See list of lectures and examinations of the module
Semester Studiensemester	2
Person in Charge Modulverantwortliche	Univ.-Prof. Dr.-Ing. Dr.h.c. dr hab. Kay Hameyer Univ.-Prof. Dr.-Ing. Armin Schnettler Univ.-Prof. Antonello Monti, Ph. D. Univ.-Prof. Antonello Monti, Ph. D. Dipl.-Ing. Ivelina Stoyanova Univ.-Prof. Dr. rer. nat. Dirk Uwe Sauer Univ.-Prof. Dr.ir. Dr.h.c. Rik W. De Doncker Univ.-Prof. Dr.-Ing. Albert Moser
Lecturer Dozenten	Univ.-Prof. Dr.-Ing. Dr.h.c. dr hab. Kay Hameyer Univ.-Prof. Dr.-Ing. Armin Schnettler Univ.-Prof. Antonello Monti, Ph. D. Univ.-Prof. Antonello Monti, Ph. D. Dipl.-Ing. Ivelina Stoyanova Univ.-Prof. Dr. rer. nat. Dirk Uwe Sauer Univ.-Prof. Dr.ir. Dr.h.c. Rik W. De Doncker Univ.-Prof. Dr.-Ing. Albert Moser
Language Sprache	English
Assignment to the curriculum Zuordnung zum Curriculum	Compulsory Module Engineering
Teaching form Lehrformen	These lab courses are ungraded. The result of a successful participation is passed. The performance of individual participants of a training group (usually 3-6 people) will be evaluated by a colloquium before and after each experiment. <ul style="list-style-type: none"> • Colloquia on each experiment • Execution of experiments • Written presentation of results
Workload Arbeitsaufwand	Total 150 h, Contact hours 75 h, Self-study 75 h
Lecture hours / Contact hours Kontaktzeit (SWS)	4
ECTS-Credit Points (CP) Kreditpunkte	5

Requierments according to examination regulation Voraussetzungen nach Prüfungsordnungen	-none-					
Learning Objectives Angestrebte Lernergebnisse	<p>Laboratory Exercise on “Power Engineering”</p> <p>After successfully completing this course, the student will have acquired the following learning outcomes:</p> <p><u>Knowledge/Understanding:</u> Students</p> <ul style="list-style-type: none"> know latest methodologies of laboratory and research practices <p><u>Abilities / Skills:</u> Students are able:</p> <ul style="list-style-type: none"> to familiarize themselves under guidance with predefined experiments and execute them. to master the relevant techniques, instrumentation and software tools for engineering-based treatment of specific tasks in Electrical Power Engineering. to apply theoretical knowledge to experimental set-ups independently. to work and organize work in teams. They are able to fulfill predefined research tasks within a narrow time frame. 					
Content Inhalt	<p>Laboratory Exercise on “Power Engineering”</p> <p>The module Laboratories on Electrical Power Engineering provides practical consolidation in the field of Electrical Power Engineering and/or practical support to lectures and exercises in this area. The students practice the application of specialized methods for the preparation and implementation of their own experiments and measurements, and learn to write reports of the experiments and measurement protocols.</p> <p>Catalogue of lab courses to be chosen of:</p> <ul style="list-style-type: none"> Power Engineering 2 Photovoltaic Power Electronic Devices High Voltage Lab Design of Application-Specific Instruction-Set Processors 					
Media Medienform	e-Learning L ² P, Power Point					
Literature Literatur	Lecture Notes Students also receive a list of relevant literature					
Lectures / Examinations Studien-/Prüfungsleistungen						
Title Titel	Code Kürzel	ECTS Kreditpunkte	Workload Arbeitsaufwand (h)	Lecture H. Kontaktzeit (h)	Self-Study Selbststudium (h)	Duration of Exam Prüfungsdauer (min)
Examination (Prüfung): LE-PE		5	0	0	0	Colloquia on each experiment Execution of experiments Written presentation of results
Exercise (Übung): LE-PE		0	75	30	45	0

Practical Session (Praktikum): LE-PE		0	75	30	45	0
Teaching Unit / Examinations: Examination Laboratory Exercise on “Power Engineering” Studien-/Prüfungsleistung: Prüfung Laboratory Exercise on “Power Engineering”						
Title Titel	Examination Laboratory Exercise on “Power Engineering”					
Sub-title Untertitel	Exa LE-PE					
Semester Studiensemester	2					
Connection to the curriculum Curriculare Verankerung	Compulsory module (variable to the semester)					
Teaching Unit / Examinations: Exercise Laboratory Exercise on “Power Engineering” Studien-/Prüfungsleistung: Übung Laboratory Exercise on “Power Engineering”						
Title Titel	Exercise Laboratory Exercise on “Power Engineering”					
Sub-title Untertitel	E LE-PE					
Semester Studiensemester	2					
Connection to the curriculum Curriculare Verankerung	Compulsory module (variable to the semester)					
Teaching Unit / Examinations: Practical Session Laboratory Exercise on “Power Engineering” Studien-/Prüfungsleistung: Praktikum Laboratory Exercise on “Power Engineering”						
Title Titel	Practical Session Laboratory Exercise on “Power Engineering”					
Sub-title Untertitel	P LE-PE					
Semester Studiensemester	2					
Connection to the curriculum Curriculare Verankerung	Compulsory module (variable to the semester)					

**Compulsory Courses Business – RWTH Aachen
(Faculty 8 - School of Business and Economics)**

**Pflichtmodulbereich – Business – RWTH Aachen
(Fakultät 8 für Wirtschaftswissenschaften)**

Module: Entrepreneurial Strategy

Module Modulbezeichnung	Power Systems
Modul level Modulniveau	Master
Code Kürzel	
Subtitle Untertitel	ES
Lecture Lehrveranstaltungen	See list of lectures and examinations of the module
Semester Studiensemester	1
Person in Charge Modulverantwortliche	Univ.-Prof. Dr. rer. pol. Malte Brettel
Lecturer Dozenten	Univ.-Prof. Dr. rer. pol. Malte Brettel
Language Sprache	English
Assignment to the curriculum Zuordnung zum Curriculum	Compulsory Module Management
Teaching form Lehrformen	<ul style="list-style-type: none"> • Written exam (schriftliche Prüfung) • Tutorial and homework
Workload Arbeitsaufwand	Total 150h, Contact hours 60h, Self-study 90h
Lecture hours / Contact hours Kontaktzeit (SWS)	4
ECTS-Credit Points (CP) Kreditpunkte	5
Requierments according to examination regulation Voraussetzungen nach Prüfungsordnungen	-none-
Learning Objectives Angestrebte Lernergebnisse	<p>Entrepreneurial Strategy</p> <p>Overall goal: Students gain theoretical and practical knowledge in <u>entrepreneurship and strategy</u> as preparation for interdisciplinary leadership roles.</p> <p>After successfully completing this course, the student will have acquired the following learning outcomes:</p> <p><u>Knowledge / Understanding:</u> Students</p>

	<ul style="list-style-type: none"> • know fundamental principles of strategic/entrepreneurial thinking and practice; • possess a comprehensive knowledge of theories in the field of strategy, entrepreneurship and innovation management • are familiar with growth strategies, particularly in the entrepreneurial context of young businesses • are prepared to better understand & possibly pursue a career in the field of entrepreneurship <p><u>Abilities / Skills:</u> Students</p> <ul style="list-style-type: none"> • are able to apply contents of the lecture to entrepreneurial situations in practice <p><u>Competencies:</u> Students</p> <ul style="list-style-type: none"> • develop own ideas into business ideas and have the foundations to create marketable products and go-to-market strategies 					
Content Inhalt	<p>Entrepreneurial Strategy</p> <p>Lecture Block 1</p> <ul style="list-style-type: none"> • Introduction to Entrepreneurship • From Idea to Opportunity • Effectuation • The Entrepreneur and his Team • The Market <p>Homework:</p> <ul style="list-style-type: none"> • Application of course content to real-life examples (take-home exercises) <p>Tutorial:</p> <ul style="list-style-type: none"> • Development of an own business idea and evaluation in a team of students • Preparation of an idea pitch video • Application of theoretical concepts from class to the business idea (e.g. application of a Business Model Canvas) • Final presentation of the business idea in class 					
Media Medienform	e-Learning L ² P, Power Point					
Literature Literatur	Lecture Notes Students also receive a list of relevant literature					
Lectures / Examinations Studien-/Prüfungsleistungen						
Title Titel	Code Kürzel	ECTS Kredit- punkte	Workload Arbeits- aufwand (h)	Lecture H. Kontakt- zeit (h)	Self-Study Selbst- studium (h)	Duration of Exam Prüfungs- dauer (min)
Examination (Prüfung): Entrepreneurial Strategy		5	0	0	0	60
Lecture (Vorlesung): Entrepreneurial Strategy		0	75	30	45	0
Exercise (Übung): Entrepreneurial Strategy		0	75	30	45	0
Teaching Unit / Examinations: Examination Entrepreneurial Strategy Studien-/Prüfungsleistung: Prüfung Entrepreneurial Strategy						
Title Titel	Examination Entrepreneurial Strategy					

Sub-title Untertitel	Exa ES
Semester Studiensemester	1
Connection to the curriculum Curriculare Verankerung	Compulsory module (variable to the semester)
Teaching Unit / Examinations: Lecture Entrepreneurial Strategy Studien-/Prüfungsleistung: Vorlesung Entrepreneurial Strategy	
Title Titel	Lecture Entrepreneurial Strategy
Sub-title Untertitel	L ES
Semester Studiensemester	1
Connection to the curriculum Curriculare Verankerung	Compulsory module (variable to the semester)
Teaching Unit / Examinations: Exercise Entrepreneurial Strategy Studien-/Prüfungsleistung: Übung Entrepreneurial Strategy	
Title Titel	Exercise Entrepreneurial Strategy
Sub-title Untertitel	E ES
Semester Studiensemester	1
Connection to the curriculum Curriculare Verankerung	Compulsory module (variable to the semester)

Module: Strategic Technology Management

Module Modulbezeichnung	Strategic Technology Management
Modul level Modulniveau	Master
Code Kürzel	
Subtitle Untertitel	STM
Lecture Lehrveranstaltungen	See list of lectures and examinations of the module
Semester Studiensemester	1
Person in Charge Modulverantwortliche	Univ.-Prof. Torsten-Oliver Salge, Ph. D.
Lecturer Dozenten	Univ.-Prof. Torsten-Oliver Salge, Ph. D.
Language Sprache	English
Assignment to the curriculum Zuordnung zum Curriculum	Compulsory Module Management
Teaching form Lehrformen	<p>Strategic Technology Management</p> <p>The course grade will be determined based on one of the following modes of evaluation:</p> <p>(a) Class participation (50%) and written exam (50%, duration: 60 minutes); or (b) Class participation (50%) and written (individual) term paper (50%); or (c) Written exam (100%, duration: 60 minutes)</p> <p>The final mode of evaluation (A, B, or C) will be announced and publicly displayed prior to the first class session. In general, grading for this class will be based on mode (a).</p>
Workload Arbeitsaufwand	Total 150h, Contact hours 60h, Self-study 90h
Lecture hours / Contact hours Kontaktzeit (SWS)	4
ECTS-Credit Points (CP) Kreditpunkte	5
Requierments according to examination regulation Voraussetzungen nach Prüfungsordnungen	-none-
Learning Objectives Angestrebte Lernergebnisse	<p>Strategic Technology Management</p> <p>Overall goal: Students gain theoretical and practical knowledge in <u>technology and innovation management</u> as preparation for interdisciplinary leadership roles in research and development (R&D) and beyond.</p> <p>After successfully completing this course, the student will have acquired the following learning outcomes:</p>

	<p><u>Knowledge / Understanding:</u></p> <p>Students:</p> <ul style="list-style-type: none"> understand and critically reflect upon key concepts and theories in strategic TIM, understand and critically discuss conceptual and empirical research papers on strategic TIM, <p><u>Abilities / Skills:</u></p> <p>Students are able:</p> <ul style="list-style-type: none"> to analyze and develop adequate solutions to some of the practical challenges of strategic TIM, to apply important tools in strategic TIM intelligently based on a thorough understanding of their respective strengths and weaknesses. 					
Content Inhalt	<p>Strategic Technology Management</p> <ul style="list-style-type: none"> This course provides a case- and/or research-based introduction to strategic technology and innovation management (TIM). This involves revisiting some of the foundational concepts and debates in strategic management and examining key strategic decisions at the heart of technology and innovation management. These might pertain for instance to <ul style="list-style-type: none"> the selection of technology fields, the composition of innovation portfolios, the timing of technology development initiatives, the development of innovation processes, the search for new ideas, the involvement of users, the implementation of modular designs, the orchestration of strategic alliances, the protection of intellectual property. As part of this course, participants will have the opportunity to become familiar with case studies and/or research papers related to these topics. The course is typically composed of six longer classroom sessions comprising a mixture of traditional lectures, case/paper discussions and student presentations. Please note, that a detailed course outline and reading list will be made available ahead of the first session 					
Media Medienform	e-Learning L ² P, Power Point					
Literature Literatur	Lecture Notes Students also receive a list of relevant literature					
Lectures / Examinations Studien-/Prüfungsleistungen						
Title Titel	Code Kürzel	ECTS Kredit- punkte	Workload Arbeits- aufwand (h)	Lecture H. Kontakt- zeit (h)	Self-Study Selbst- studium (h)	Duration of Exam Prüfungs- dauer (min)
Examination (Prüfung): Strategic Technology Management		5	0	0	0	Mode (a), (b) or (c); please see on field "grading"
Lecture (Vorlesung): Strategic Technology Management		0	120	60	60	0
Exercise (Übung): Strategic Technology Management		0	30	0	30	0
Teaching Unit / Examinations: Examination Strategic Technology Management						

Studien-/Prüfungsleistung: Prüfung Strategic Technology Management	
Title Titel	Examination Strategic Technology Management
Sub-title Untertitel	Exa STM
Semester Studiensemester	1
Connection to the curriculum Curriculare Verankerung	Compulsory module (variable to the semester)
Teaching Unit / Examinations: Lecture Strategic Technology Management Studien-/Prüfungsleistung: Vorlesung Strategic Technology Management	
Title Titel	Lecture Strategic Technology Management
Sub-title Untertitel	L STM
Semester Studiensemester	1
Connection to the curriculum Curriculare Verankerung	Compulsory module (variable to the semester)
Teaching Unit / Examinations: Exercise Strategic Technology Management Studien-/Prüfungsleistung: Übung Strategic Technology Management	
Title Titel	Exercise Strategic Technology Management
Sub-title Untertitel	E STM
Semester Studiensemester	1
Connection to the curriculum Curriculare Verankerung	Compulsory module (variable to the semester)

Module: Finance and Accounting

Module Modulbezeichnung	Finance and Accounting
Modul level Modulniveau	Master
Code Kürzel	
Subtitle Untertitel	FA
Lecture Lehrveranstaltungen	See list of lectures and examinations of the module
Semester Studiensemester	2
Person in Charge Modulverantwortliche	Univ.-Prof. Dr. rer. pol. Peter Letmathe
Lecturer Dozenten	Univ.-Prof. Dr. rer. pol. Peter Letmathe
Language Sprache	English
Assignment to the curriculum Zuordnung zum Curriculum	Compulsory Module Management
Teaching form Lehrformen	Written Exam (schriftliche Prüfung)
Workload Arbeitsaufwand	Total 150h, Contact hours 60h, Self-study 90h
Lecture hours / Contact hours Kontaktzeit (SWS)	4
ECTS-Credit Points (CP) Kreditpunkte	5
Requierments according to examination regulation Voraussetzungen nach Prüfungsordnungen	-none-
Learning Objectives Angestrebte Lernergebnisse	<p>Finance and Accounting</p> <p>Overall goal is that students gain theoretical and practical knowledge in <u>finance and accounting</u> as preparation for interdisciplinary leadership roles.</p> <p>After successfully completing this course, the students will have acquired the following learning outcomes:</p> <p><u>Knowledge / Understanding:</u></p> <p>Students</p> <ul style="list-style-type: none"> • have an understanding of financial accounting systems and processes, • have knowledge of financial reports and how they are derived from double-entry bookkeeping; • have an understanding of an enterprise's financial objectives and their relevance for corporate decision-making <p><u>Abilities / Skills:</u></p> <p>Students</p>

	<ul style="list-style-type: none"> • are able to apply decision-oriented methods of cost category, cost center and cost unit accounting; • apply these methods of financial accounting to diverse decision situations in different managerial contexts; • apply methods of capital budgeting to analyse financial consequences of investment alternatives. • can consider the capital structure of an enterprise, which is important to choose financing instruments in line with corporate goals 					
Content Inhalt	<p>Finance and Accounting</p> <p>Focus topics in financial accounting:</p> <ul style="list-style-type: none"> • Structure of financial reports • Double-entry bookkeeping • Treatment of relevant events (business transactions) during the financial year • Treatment of other relevant events at the end of the financial year <p>Focus topics in management accounting:</p> <ul style="list-style-type: none"> • Introductory case study • Cost category accounting • Cost center accounting • Cost unit accounting • Application of management accounting methods in selected decision situations <p>Focus topics in finance:</p> <ul style="list-style-type: none"> • Financial objectives • Time value of money and capital budgeting • Forms of financing • Capital structure 					
Media Medienform	e-Learning L ² P, Power Point					
Literature Literatur	Lecture Notes Students also receive a list of relevant literature					
Lectures / Examinations Studien-/Prüfungsleistungen						
Title Titel	Code Kürzel	ECTS Kreditpunkte	Workload Arbeitsaufwand (h)	Lecture H. Kontaktzeit (h)	Self-Study Selbststudium (h)	Duration of Exam Prüfungsdauer (min)
Examination (Prüfung): Finance and Accounting		5	0	0	0	60
Lecture (Vorlesung): Finance and Accounting		0	75	30	45	0
Exercise (Übung): Finance and Accounting		0	75	30	45	0
Teaching Unit / Examinations: Examination Finance and Accounting Studien-/Prüfungsleistung: Prüfung Finance and Accounting						
Title Titel	Examination Innovation Management					
Sub-title Untertitel	Exa FA					
Semester Studiensemester	2					
Connection to the curriculum	Compulsory module (variable to the semester) Semestervariable Pflichtleistung					

Curriculare Verankerung	
Teaching Unit / Examinations: Lecture Finance and Accounting Studien-/Prüfungsleistung: Vorlesung Finance and Accounting	
Title Titel	Lecture Finance and Accounting Vorlesung Finance and Accounting
Sub-title Untertitel	L FA
Semester Studiensemester	2
Connection to the curriculum Curriculare Verankerung	Compulsory module (variable to the semester)
Teaching Unit / Examinations: Exercise Finance and Accounting Studien-/Prüfungsleistung: Übung Finance and Accounting	
Title Titel	Exercise Finance and Accounting
Sub-title Untertitel	E FA
Semester Studiensemester	2
Connection to the curriculum Curriculare Verankerung	Compulsory module (variable to the semester) Semestervariable Pflichtleistung

Compulsory Courses Business – Maastricht School of Management (MSM)

Pflichtmodulbereich – Business – Maastricht School of Management

Module: International Business

Module Modulbezeichnung	International Business
Modul level Modulniveau	Master
Code Kürzel	
Subtitle Untertitel	IB
Lecture Lehrveranstaltungen	See list of lectures and examinations of the module
Semester Studiensemester	3
Person in Charge Modulverantwortliche	Dr. Jeroen van Wijk
Lecturer Dozenten	Dr. Jeroen van Wijk
Language Sprache	English
Assignment to the curriculum Zuordnung zum Curriculum	Compulsory Module Management
Teaching form Lehrformen	<ul style="list-style-type: none"> - Classroom interactive lecturing; - Case-study analysis and presentation (in groups); - Group-based FDI strategy diagnosis of a MNE; - Simulation Roundtable Negotiation.
Workload Arbeitsaufwand	Total 140 hours: 40 hours in class, 100 hours self study
Lecture hours / Contact hours Kontaktzeit (SWS)	40 hours / three weeks
ECTS-Credit Points (CP) Kreditpunkte	5
Requierments according to examination regulation Voraussetzungen nach Prüfungsordnungen	-none
Learning Objectives Angestrebte Lernergebnisse	<p>International Business</p> <p>After successfully completing this course, the student will be able to:</p> <p><u>Knowledge / Understanding:</u></p> <p>(a) Students know and understand the main drivers of transformations in the global economy.</p> <p><u>Abilities / Skills:</u></p> <p>(a) Students apply the new knowledge to analyse the competitive position of a national industry sector in the global economy, and devise a suitable internationalization strategy for an individual company;</p>

	(b) Students critically assess and judge the implications for business development in a new host country. <u>Competencies:</u> (a) Students communicate the analysis and implications to both lay and specialist audiences in the private and public sectors.					
Content Inhalt	International Business <ul style="list-style-type: none"> • Transformations in the global economy: • World Trade System • Foreign Direct Investment Strategies • Innovation and Upgrading in Supply Chains • CSR and International Stakeholder Management 					
Media Medienform	N/A					
Literature Literatur	<p>Books:</p> <p>Van Tulder , R. , Verbeke, A. & Drogendijk, R. (eds) (2015). <i>The Future of Global Organizing (Progress in International Business Research, Volume 10)</i> Emerald Group Publishing Limited.</p> <p>Scott, W. Richard (2014) <i>Institutions and Organizations</i>. Sage Publications, Thousand Oaks, CA, USA.</p> <p>Gereffi, G. & Lee, J. (2012). Why the world suddenly cares about global supply chains. <i>Journal of Supply Chain Management</i>, 48(3), 24-32.</p>					
Lectures / Examinations Studien-/Prüfungsleistungen						
Title Titel	Code Kürzel	ECTS Kreditpunkte	Workload Arbeitsaufwand (h)	Lecture H. Kontaktzeit (h)	Self-study Selbststudium (h)	Duration of Exam Prüfungsdauer
Examination (Prüfung): International Business		5	0	0	0	3 hours (written exam)
Lecture (Vorlesung): International Business		0	50	40h/ three weeks		0
Exercise (Übung): International Business		0	50			0
Teaching Unit / Examinations: Examination International Business Studien-/Prüfungsleistung: Prüfung International Business						
Title Titel	Examination International Business					
Sub-title Untertitel	Exa IB					
Semester Studiensemester	3					
Connection to the curriculum Curriculare Verankerung	Compulsory module					
Teaching Unit / Examinations: Lecture International Business Studien-/Prüfungsleistung: Vorlesung International Business						
Title Titel	Lecture International Business					
Sub-title Untertitel	L IB					
Semester Studiensemester	3					

Connection to the curriculum Curriculare Verankerung	Compulsory module
Teaching Unit / Examinations: Exercise International Business Studien-/Prüfungsleistung: Übung International Business	
Title Titel	Exercise International Business
Sub-title Untertitel	E IB
Semester Studiensemester	3
Connection to the curriculum Curriculare Verankerung	Compulsory module

Module: Organizational Development & Change

Module Modulbezeichnung	Organizational Development & Change
Modul level Modulniveau	Master
Code Kürzel	
Subtitle Untertitel	ODC
Lecture Lehrveranstaltungen	See list of lectures and examinations of the module
Semester Studiensemester	3
Person in Charge Modulverantwortliche	Prof. Dr. Geert Heling
Lecturer Dozenten	Prof. Dr. Geert Heling
Language Sprache	English
Assignment to the curriculum Zuordnung zum Curriculum	Compulsory Module Management
Teaching form Lehrformen	Lectures, discussion, individual and group assignments, student presentations
Workload Arbeitsaufwand	100 hours
Lecture hours / Contact hours Kontaktzeit (SWS)	40 hours / Three weeks
ECTS-Credit Points (CP) Kreditpunkte	5
Requierements according to examination regulation Voraussetzungen nach Prüfungsordnungen	-none-
Learning Objectives Angestrebte Lernergebnisse	<p>Organizational Development & Change</p> <p>After successfully completing this course, the student will be able to:</p> <p><u>Knowledge / Understanding:</u></p> <p>(a) Students know and understand i) organizational behavior, culture and learning, ii) management tools and instruments to improve and implement change, iii) professionalism and knowledge management, iv) role of leadership in change, and in learning, developing, and improving organizations, and v) the role of external influence of stakeholders like government and the political system.</p> <p><u>Abilities / Skills:</u></p> <p>(a) Students are enabled to apply this knowledge in such a way that they can assess current organizational settings and situations, and come up with encompassing ideas and plans for adjustment, improvement and adequate implementation of the acquired knowledge, skills and insights. All this with specific attention to the conditions of developing countries and emerging economies.</p> <p><u>Competencies:</u></p> <p>(a) Students can critically assess or judge the suitability of instruments and policies to improve and develop professionals and organizations in different cultural contexts, with</p>

	<p>specific attention to the reality of possible and existing hurdles in developing countries and emerging economies.</p> <p>(b) Students can communicate the outcomes of above mentioned assessments, plans and discussion to students, colleagues and management of their organization.</p> <p>(c) Students learn how to critically think about interpersonal communication, management and leadership skills, and the role of ethics, politics and political influence in less stable political environments</p>					
Content Inhalt	<ul style="list-style-type: none"> • Basic concepts of organizational behavior, motivation, performance, culture, change and learning • Leadership • Organizational structure and (re) design • Organizational culture • Societal HRM, HRM in developing countries • Diagnosing organizational mechanisms • Change management • Psychological dynamics of change • Planning and implementing change • Values, ethics and integrity • Applied to various cases 					
Media Medienform	Power Point, white board, flipover board					
Literature Literatur	<p>Chapters from the following books:</p> <ul style="list-style-type: none"> • Cameron & Green (2012), Making Sense of Change Management, 3rd Edition, Kogan Page. • Daft, R. L. (2012) Organization Theory and Design, South-Western. • Robbins, S.P. & N. Barnwell (2002) Organizational Theory, Concepts and Cases, Prentice-Hall. • Adler, N.J. (2007) International Dimensions of Organizational behavior, South-Western <p>Students receive a list of articles as additional mandatory literature at the beginning of the course</p>					
Lectures / Examinations						
Studien-/Prüfungsleistungen						
Title Titel	Code Kürzel	ECTS Kredit- punkte	Workload Arbeits- aufwand (h)	Lecture H. Kontakt- zeit (h)	Self-study Selbst- studium (h)	Duration of Exam Prüfungs- dauer (min)
Examination (Prüfung): Organizational Development & Change		5	0	0	0	
Lecture (Vorlesung): Organizational Development & Change		0	50	40h/ three weeks		0
Exercise (Übung): Organizational Development & Change		0	50			0
Teaching Unit / Examinations: Examination Organizational Development & Change						
Studien-/Prüfungsleistung: Prüfung Organizational Development & Change						
Title Titel	Examination Organizational Development & Change					
Sub-title Untertitel	Exa ODC					
Semester Studiensemester	3					
Connection to the curriculum Curriculare Verankerung	Compulsory module (variable to the semester)					

Teaching Unit / Examinations: Lecture Organizational Development & Change Studien-/Prüfungsleistung: Vorlesung Organizational Development & Change	
Title Titel	Lecture Organizational Development & Change
Sub-title Untertitel	L ODC
Semester Studiensemester	3
Connection to the curriculum Curriculare Verankerung	Compulsory module (variable to the semester)
Teaching Unit / Examinations: Exercise Global Organizational Development & Change Studien-/Prüfungsleistung: Übung Global Organizational Development & Change	
Title Titel	Exercise Organizational Development & Change
Sub-title Untertitel	E ODC
Semester Studiensemester	3
Connection to the curriculum Curriculare Verankerung	Compulsory module (variable to the semester)

Module: International Project Management

Module Modulbezeichnung	International Project Management
Modul level Modulniveau	Master
Code Kürzel	
Subtitle Untertitel	IPM
Lecture Lehrveranstaltungen	See list of lectures and examinations of the module
Semester Studiensemester	3
Person in Charge Modulverantwortliche	Stadhouders, Joris
Lecturer Dozenten	Stadhouders, Joris
Language Sprache	English
Assignment to the curriculum Zuordnung zum Curriculum	Compulsory Module Management
Teaching form Lehrformen	Interactive lectures, case analysis sessions, computer hands-on, group project presentations and discussions.
Workload Arbeitsaufwand	Total 140 hours: 40 hours in class, 100 hours self study and group work
Lecture hours / Contact hours Kontaktzeit (SWS)	40 lecture hours distributed over 3 calendar weeks
ECTS-Credit Points (CP) Kreditpunkte	5
Requierments according to examination regulation Voraussetzungen nach Prüfungsordnungen	-none-
Learning Objectives Angestrebte Lernergebnisse	<p>International Project Management</p> <p>After successfully completing this course, the student will be able to:</p> <p>Knowledge / Understanding:</p> <ul style="list-style-type: none"> (a) Students understand the kind of issues that can be addressed and resolved through projects; (b) Students know the context in which international project management takes place, including the reference to different stakeholders (their goals, interests, requirements, needs, their involvement and impact on success), including the reference to program management and project portfolio management; (c) Students know the different project management methodologies; (d) Students understand the theories, concepts and processes (e.g. those of the project cycle) relevant for project management; (e) Students know the factors contributing to project success and to project failure and the management of the project related aspects risk, scope, time, costs, quality, human resources, communications, procurement, integration and their relevance for project success; (f) Students know the tools and models that can support the analysis, design, planning, management, monitoring, control and evaluation of international projects.

	<p>Abilities / Skills:</p> <ul style="list-style-type: none"> (a) (Based on a business case) Students can formulate a project charter, to identify stakeholders, to establish a project's scope and to develop a well founded project management plan; (b) Students monitor and evaluate the progress and implementation of an on-going project and to evaluate a terminated or closed project; (c) Students select and use project management software for the planning, monitoring and evaluation purposes described above; (d) Students define issues in an international project management case situation, to analyze them critically with relevant models, and to arrive at solid recommendations for improvement; (e) Students assess the suitability of different project management options related to the above; (f) Students write a well referenced analytical report on international project management issues; (g) Students present and defend such a report in front of an audience of peers.
<p>Content Inhalt</p>	<p>Course contents will largely follow the learning objectives above mentioned. Topics covered are as follows.</p> <p>Setting the stage Projects and operations The international project management context Stakeholders: their goals, interests, requirements, needs, involvement and impact Program management and project portfolio management in an international context</p> <p>Getting the goals right Problem tree analysis, logframe, systems thinking and dynamics, cause effect modelling.</p> <p>Approaches Project management methodologies: traditional (project cycle), pilot, phased, iterative, agile, critical chain Cycle stages: Initiation, planning, execution, monitoring and controlling, closing</p> <p>Success and Failure Factors for project success and failure, in an international context International standards (including PRINCE2) Project integration management Project risk management</p> <p>Management aspects Project scope, time and costs management Project quality management Project HR, communications and procurement management</p> <p>Application: cases, lab-work, presentations, discussions (mainly PM sessions) Developing a well founded project management plan (lab session) International case studies (group work and in-class discussion sessions) Using and applying project management software (lab sessions) Presentations and discussions on project reports (class session)</p>
<p>Media Medienform</p>	<p>e-Learning, Power Point</p>
<p>Literature Literatur</p>	<p>Chapters from the following books will be used:</p> <ul style="list-style-type: none"> - Grisham, T.W., (2009), <i>International Project Management: Leadership in Complex Environments</i>, Wiley - Koster, K. (2009), <i>International Project Management</i>, 1st ed. , SAGE Publications - Meredith, J.R. and Mantel, S.C (2012), <i>Project Management</i>, 8th ed, John Wiley & Sons. (international student version) - PMI (2013), <i>Project Management Body of Knowledge Guide</i>, 5th ed. PMI (www.pmi.org) - Schwalbe, K. (2013), <i>Managing Information Technology Projects</i>, 7th ed. Course Technology Cengage Learning (international edition) <p>Course participants will receive, at the beginning of the course, a number of exercises and cases, as well as a list of about ten articles as additional mandatory literature.</p>

Lectures / Examinations Studien-/Prüfungsleistungen						
Title Titel	Code Kürzel	ECTS Kredit- punkte	Workload Arbeits- aufwand (h)	Lecture H. Kontakt- zeit (h)	Self-study Selbst- studium (h)	Duration of Exam Prüfungs- dauer (min)
Examination (Prüfung): International Project Management		5	0	0	0	
Lecture (Vorlesung): International Project Management		0	70	40h/ three weeks	50	0
Exercise (Übung): International Project Management		0	70		50	0
Teaching Unit / Examinations: Examination International Project Management Studien-/Prüfungsleistung: Prüfung International Project Management						
Title Titel	Examination International Project Management					
Sub-title Untertitel	Exa IPM					
Semester Studiensemester	3					
Connection to the curriculum Curriculare Verankerung	Compulsory module					
Teaching Unit / Examinations: Lecture International Project Management Studien-/Prüfungsleistung: Vorlesung International Project Management						
Title Titel	Lecture International Project Management					
Sub-title Untertitel	L IPM					
Semester Studiensemester	3					
Connection to the curriculum Curriculare Verankerung	Compulsory module					
Teaching Unit / Examinations: Exercise International Project Management Studien-/Prüfungsleistung: Übung International Project Management						
Title Titel	Exercise International Project Management					
Sub-title Untertitel	E IPM					
Semester Studiensemester	3					
Connection to the curriculum Curriculare Verankerung	Compulsory module					

Module: Economics for Managers

Module Modulbezeichnung	Economics for Managers
Modul level Modulniveau	Master
Code Kürzel	
Subtitle Untertitel	EM
Lecture Lehrveranstaltungen	See list of lectures and examinations of the module
Semester Studiensemester	3
Person in Charge Modulverantwortliche	Prof. Aad van Mourik
Lecturer Dozenten	Prof. Aad van Mourik
Language Sprache	English
Assignment to the curriculum Zuordnung zum Curriculum	Compulsory Module Management
Teaching form Lehrformen	Lectures, discussion, individual and group assignments
Workload Arbeitsaufwand	100 hours
Lecture hours / Contact hours Kontaktzeit (SWS)	40 hours / Three weeks
ECTS-Credit Points (CP) Kreditpunkte	5
Requierments according to examination regulation Voraussetzungen nach Prüfungsordnungen	-none-
Learning Objectives Angestrebte Lernergebnisse	<p>Economics for Managers</p> <p>After successfully completing this course, the student will be able to:</p> <p><u>Knowledge / Understanding:</u></p> <p>(a) Students know and understand the complex interaction of national and global markets at both, the micro and the macro level;</p> <p><u>Abilities / Skills:</u></p> <p>(a) Students can transfer this knowledge to rational managerial decision making in organizations taking into account a dynamic global environment;</p> <p><u>Competencies:</u></p> <p>(a) Students critically assess and analyse corporate decisions in their national institutional contexts, and communicate these assessments to managers as well as to non-specialist audiences;</p> <p>(b) Students analyse and assess company performances autonomously by using all available information sources.</p>

Content Inhalt	<ul style="list-style-type: none"> • Basic economic principles (marginal cost pricing, decision making, interaction government policies); • Demand analysis, supply and market equilibrium • Production, costs, and pricing • Competition and strategic interaction • Impact of macroeconomic dynamics on corporate strategy • Understanding goods market developments • Modern financial markets and the workings of monetary and fiscal policies • Business cycle, inflation and unemployment • Economic growth and technical progress • Macroeconomics policymaking in open economies • Applied to various cases 					
Media Medienform	e-Learning, Power Point, , white board, flipover board					
Literature Literatur	<ul style="list-style-type: none"> • O'Sullivan, A., Sheffrin, S., and Perez, S. (2011). Survey of economics: Principles, Applications and Tools. Pearson, London, 5th ed. • IMF, World Economic Outlook, latest issues. • World Bank, World Development report, various years. <p>Students receive a list of articles as additional mandatory literature at the beginning of the course</p>					
Lectures / Examinations						
Studien-/Prüfungsleistungen						
Title Titel	Code Kürzel	ECTS Kredit- punkte	Workload Arbeits- aufwand (h)	Lecture H. Kontakt- zeit (h)	Self-study Selbst- studium (h)	Duration of Exam Prüfungs- dauer (min)
Examination (Prüfung): Economics for Managers		5	0	0	0	
Lecture (Vorlesung): Economics for Managers		0	50	40h/ three weeks		0
Exercise (Übung): Economics for Managers		0	50			0
Teaching Unit / Examinations: Examination Economics for Managers						
Studien-/Prüfungsleistung: Prüfung Economics for Managers						
Title Titel	Examination Economics for Managers					
Sub-title Untertitel	Exa EM					
Semester Studiensemester	3					
Connection to the curriculum Curriculare Verankerung	Compulsory module (variable to the semester)					
Teaching Unit / Examinations: Lecture Economics for Managers						
Studien-/Prüfungsleistung: Vorlesung Economics for Managers						
Title Titel	Lecture Economics for Managers					
Sub-title Untertitel	L EM					
Semester Studiensemester	3					
Connection to the curriculum	Compulsory module (variable to the semester)					

Curriculare Verankerung	
Teaching Unit / Examinations: Exercise Economics for Managers Studien-/Prüfungsleistung: Übung Economics for Managers	
Title Titel	Exercise Economics for Managers
Sub-title Untertitel	E EM
Semester Studiensemester	3
Connection to the curriculum Curriculare Verankerung	Compulsory module (variable to the semester)

Module: Responsible Supply Chain Management

Module Modulbezeichnung	Responsible Supply Chain Management
Modul level Modulniveau	Master
Code Kürzel	
Subtitle Untertitel	RSCM
Lecture Lehrveranstaltungen	See list of lectures and examinations of the module
Semester Studiensemester	3
Person in Charge Modulverantwortliche	Dr. Vincent Feltkamp
Lecturer Dozenten	<ul style="list-style-type: none"> • Dr. Vincent Feltkamp • Dr. Jacques H. Trienekens • Dr. Jeroen van Wijk C.A.C.
Language Sprache	English
Assignment to the curriculum Zuordnung zum Curriculum	Compulsory Module Management
Teaching form Lehrformen	Lectures, documentary films, discussion, individual and group assignments, student presentations
Workload Arbeitsaufwand	100 hours
Lecture hours / Contact hours Kontaktzeit (SWS)	40 hours / Three weeks
ECTS-Credit Points (CP) Kreditpunkte	5
Requierments according to examination regulation Voraussetzungen nach Prüfungsordnungen	-none-
Learning Objectives Angestrebte Lernergebnisse	<p>Responsible Supply Chain Management</p> <p>After successfully completing this course, the student will be able to:</p> <p><u>Knowledge / Understanding:</u></p> <p>(a) Students know and understand the basic concepts of supply chain management and the impact of SCM on the profitability of a firm;</p> <p><u>Abilities / Skills:</u></p> <p>(a) Students can formulate supply chain strategies that address long lead times, uncertainties in demand, information sharing issues, and that elaborate on effective inventory management strategies;</p> <p>(c) Students are able to establish push pull boundaries in supply chains to optimize use of economies of scale and scope;</p> <p>(d) Students assess the suitability of different types of supplier-buyer relationships, and their impact on suppliers and buyer particularly in respect of emerging economy or developing country contexts;</p> <p><u>Competencies:</u></p>

	<p>(a) Students are able to critically evaluate operations of a supply chain in its local and global contexts, in terms of their environmental and social sustainability;</p> <p>(b) Students apply this knowledge in setting up and optimizing supply chains, communicate strategic issues with the management within the organization and with stakeholders in and beyond the supply chain.</p>					
Content Inhalt	<ul style="list-style-type: none"> • Inventory management and risk pooling • Supply chain: network planning, integration, supply contracts, distribution, procurement, and outsourcing • Strategic Alliance • Global logistics & risk management • Process modeling, simulation, • Coordinated product & supply chain design • Customer value and smart pricing • Supply chains and value chains • Market demand and quality assurance • Multi-stakeholder supply chain partnerships • Applied to various cases 					
Media Medienform	e-Learning, Power Point, in class laptop simulations					
Literature Literatur	<ul style="list-style-type: none"> • (L&L) Lee, H. & Lee, C. (2007). Building supply chain excellence in emerging economies. Springer (Emerging markets case studies) • (SKS) Simchi-Levi, D. Kaminsky, Ph. and Simchi-Levi, E. (2008). Designing and Managing Supply Chain: Concepts, Strategies, and Case Studies, 3rd edition, Irwin/McGraw-Hill. (Theories of supply chain management, and cases from the developed world. • Van Dijk, M.P., Trienekens, J. (eds) (2012). Global Value Chains. Linking Local producers from Developing Countries to International Markets. Amsterdam University Press. (Value chains and Emerging Markets perspectives) <p>Students receive a list of articles as additional mandatory literature at the beginning of the course</p>					
Lectures / Examinations Studien-/Prüfungsleistungen						
Title Titel	Code Kürzel	ECTS Kredit- punkte	Workload Arbeits- aufwand (h)	Lecture H. Kontakt- zeit (h)	Self-study Selbst- studium (h)	Duration of Exam Prüfungs- dauer (min)
Examination (Prüfung): Responsible Supply Chain Management		5	0	0	0	
Lecture (Vorlesung): Responsible Supply Chain Management		0	50	40h/ three weeks		0
Exercise (Übung): Responsible Supply Chain Management		0	50			0
Teaching Unit / Examinations: Examination Responsible Supply Chain Management Studien-/Prüfungsleistung: Prüfung Responsible Supply Chain Management						
Title Titel	Examination Responsible Supply Chain Management					
Sub-title Untertitel	Exa RSCM					
Semester Studiensemester	3					
Connection to the curriculum Curriculare Verankerung	Compulsory module (variable to the semester)					
Teaching Unit / Examinations: Lecture Responsible Supply Chain Management						

Studien-/Prüfungsleistung: Vorlesung Responsible Supply Chain Management	
Title Titel	Lecture Responsible Supply Chain Management
Sub-title Untertitel	L RSCM
Semester Studiensemester	3
Connection to the curriculum Curriculare Verankerung	Compulsory module (variable to the semester)
Teaching Unit / Examinations: Exercise Responsible Supply Chain Management Studien-/Prüfungsleistung: Übung Responsible Supply Chain Management	
Title Titel	Exercise Responsible Supply Chain Management
Sub-title Untertitel	E RSCM
Semester Studiensemester	3
Connection to the curriculum Curriculare Verankerung	Compulsory module (variable to the semester)

Module: Leadership and High Performance Teams

Module Modulbezeichnung	Leadership and High Performance Teams
Modul level Modulniveau	Master
Code Kürzel	
Subtitle Untertitel	LHPT
Lecture Lehrveranstaltungen	See list of lectures and examinations of the module
Semester Studiensemester	3
Person in Charge Modulverantwortliche	Dr. Stephanie Jones, Prof. André de Waal
Lecturer Dozenten	Dr. Stephanie Jones, Prof. André de Waal
Language Sprache	English
Assignment to the curriculum Zuordnung zum Curriculum	Compulsory Module Management
Teaching form Lehrformen	Lectures, discussions, individual and group assignments, student presentations
Workload Arbeitsaufwand	100 hours
Lecture hours / Contact hours Kontaktzeit (SWS)	40 hours / Three weeks
ECTS-Credit Points (CP) Kreditpunkte	5
Requierments according to examination regulation Voraussetzungen nach Prüfungsordnungen	-none-
Learning Objectives Angestrebte Lernergebnisse	<p>Leadership and High Performance Teams</p> <p>After successfully completing this course, the students will have acquired the following learning outcomes:</p> <p><u>Knowledge / Understanding</u></p> <p>(a) Students know and understand</p> <ul style="list-style-type: none"> • the factors which an organization should manage to become high performing (and also the factors that are not important); • the detailed 35 characteristics of a High Performance Organization (HPO)M • how other organizations work on becoming HPO, what lessons are learned and the best ideas; • how leadership development can be implemented; • how leaders drive change and approach managing organizational change • how leaders handle crises, conflict, power and politics; • how they go about leading a team. <p><u>Abilities / Skills:</u></p>

	<p>(a) Students evaluate where an organization has to improve in order to become an HPO; (b) Students apply the HPO Framework in an organization and can start the transition to an HPO.</p> <p><u>Competencies:</u> (a) Students help and coach colleagues in making the transition towards HPO; (b) Students create their own attitude towards leadership.</p>					
Content Inhalt	<p>Leadership and High Performance Teams</p> <ul style="list-style-type: none"> - Introduction into the HPO research - Development of the HPO Framework: the qualitative part - Development of the HPO Framework: the quantitative part - Preparing the HPO Diagnosis - Executing the HPO Diagnosis - Introduction to the leadership role and task - Leadership theories – transactional and transformational – the ten roles of the leader/manager - Leadership, conflict, power and politics in organizations - Leadership to complete tasks or develop people? - Leadership, culture and change - Leadership and crisis management - Leadership, CSR and ethics - Your personal leadership style, personality and profile - Leader case studies – Jack Welch, Margaret Thatcher, other corporate leaders and leaders from history (Napoleon Bonaparte etc.) 					
Media Medienform	Powerpoints, book, pdfs, excel documents, videos and film clips, handouts in hard copy, whiteboard, flipcharts, etc.					
Literature Literatur	<p>Books and articles:</p> <ul style="list-style-type: none"> • de Waal, A.A. (2015), <i>What makes a high performance organization</i>, 2nd edition, Hilversum: The HPO Center • Remme J., Jones, S., and De Bono, S. (2008) <i>Leadership, Change and Responsibility</i>, Oxford: Meyer and Meyer. • Gosling, J., Jones, S., Sutherland, I. and Dijkstra, J. (2012) <i>Key Concepts in Leadership</i>, London: Sage. • Gosling, J. and Minzberg, H. (2003) 'The Five Minds of the Manager', <i>Harvard Business Review</i>, Nov., 81(11): 54-63. • Rooke, D. and Torbert, W. (2005) 'The Seven Transformations of Leadership', <i>Harvard Business Review</i>, April, 83(4): 66-76 <p>Students will receive details of additional materials at the beginning of the course.</p>					
Lectures / Examinations						
Studien-/Prüfungsleistungen						
Title Titel	Code Kürzel	ECTS Kredit- punkte	Workload Arbeits- aufwand (h)	Lecture H. Kontakt- zeit (h)	Self-study Selbst- studium (h)	Duration of Exam Prüfungs- dauer
Examination (Prüfung): Leadership and High Performance Teams		5	0	0	0	3 hours (written exam)
Lecture (Vorlesung): Leadership and High Performance Teams		0	50	40h/ three weeks		0
Exercise (Übung): Leadership and High Performance Teams		0	50			0
Teaching Unit / Examinations: Examination Leadership and High Performance Teams						
Studien-/Prüfungsleistung: Prüfung Leadership and High Performance Teams						
Title Titel	Examination Leadership and High Performance Teams					

Sub-title Untertitel	Exa LHPT
Semester Studiensemester	3
Connection to the curriculum Curriculare Verankerung	Compulsory module
Teaching Unit / Examinations: Lecture Leadership and High Performance Teams Studien-/Prüfungsleistung: Vorlesung Leadership and High Performance Teams	
Title Titel	Lecture Leadership and High Performance Teams
Sub-title Untertitel	L LHPT
Semester Studiensemester	3
Connection to the curriculum Curriculare Verankerung	Compulsory module
Teaching Unit / Examinations: Exercise Leadership and High Performance Teams Studien-/Prüfungsleistung: Übung Leadership and High Performance Teams	
Title Titel	Exercise Leadership and High Performance Teams
Sub-title Untertitel	E LHPT
Semester Studiensemester	3
Connection to the curriculum Curriculare Verankerung	Compulsory module

Compulsory non-technical (Zusatzbereich)

Module: Master Thesis – RWTH / MSM

Module Modulbezeichnung	Master Thesis
Modul level Modulniveau	Master
Code Kürzel	
Subtitle Untertitel	MaThe
Lecture Lehrveranstaltungen	See list of lectures and examinations of the module
Semester Studiensemester	4
Person in Charge Modulverantwortliche	RWTH Aachen / MSM
Lecturer Dozenten	RWTH Aachen / MSM
Language Sprache	English
Assignment to the curriculum Zuordnung zum Curriculum	Compulsory Module Non-Technical
Teaching form Lehrformen	Supervision and assistance by the relevant professor
Workload Arbeitsaufwand	6 Months
Lecture hours / Contact hours Kontaktzeit (SWS)	-
ECTS-Credit Points (CP) Kreditpunkte	30
Requierments according to examination regulation Voraussetzungen nach Prüfungsordnungen	The topic of the Master's thesis cannot be assigned until 60 CPs have been achieved and the proof of completion of the requirements is shown. Reasonable exceptions are governed by the Board of Examiners upon request by the candidate.
Learning Objectives Angestrebte Lernergebnisse	Master Thesis The students learn the independent approach and processing of academic themes, their documentation and written interpretation within a set deadline. They acquire systematic academic research skills.
Content Inhalt	Master Thesis Completed academic paper which shall show that the students are capable of independently processing a problem related to their subject according to academic methods within a set deadline.
Media Medienform	-
Literature Literatur	According to the relevant research questions of the Master's Thesis
Lectures / Examinations	

Studien-/Prüfungsleistungen						
Title Titel	Code Kürzel	ECTS Kredit- punkte	Workload Arbeits- aufwand (h)	Lecture H. Kontakt- zeit (h)	Self-study Selbst- studium (h)	Duration of Exam Prüfungs- dauer (min)
Master Thesis (Masterarbeit)		30	0	0	0	0
Master´s Thesis defense colloquium (Masterarbeitskolloquium)		0	0	0	0	30-45
Teaching Unit / Examinations: Examination Master Thesis Studien-/Prüfungsleistung: Prüfung Masterarbeit						
Title Titel	Master Thesis Masterarbeit					
Sub-title Untertitel	Exa MaThe					
Semester Studiensemester	4					
Teaching Unit / Examinations: Master´s Thesis Defense Colloquium Studien-/Prüfungsleistung: Masterarbeitskolloquium						
Title Titel	Master´s Thesis Defense Colloquium Masterarbeitskolloquium					
Sub-title Untertitel	DC MaThe					
Semester Studiensemester	4					