Qualification Profile REMENA

Graduates of the Mastercourse REMENA shall

- have academic and practical expertise in specific working areas, intercultural and organizational competence as well as regional and language skills in order to contribute substantially in the future as experts in renewable energy projects between Europe and the Arab region.

- supervise projects in the field of sustainable energy supply, take technically profound decisions to promote related development processes.

- have the ability for written and oral presentation, self-organisation, teamwork, skills and experience in project management, and as far as possible have personal leadership qualification intented to conduct efficiently in the framework of international cooperations.

- have abstraction ability, creativity, ability for critical reflection of their own work and the readiness to take over responsibility for the results of the individual working outcome.

- have the empathic awareness, that technical, economical, ecological, legal as well as social framework conditions, namely intercultural aspects, must be considered in carrying out projects in the field of renewable energy.

- have the capability to recognize complex problems in the framework of renewable energy and energy efficiency and review their solvability and feasibility within a given time frame.

- have the ability to integrate peculiarities of Western European and Arab cultural influences in the framework of renewable energy and energy efficiency into these activities.

- contribute their job performance to interdisciplinary working groups.

- be capable of generating problem solutions on the basis of state-of-the art research papers

- be qualified to work autonomously in industry and commerce in the field of renewable energy and energy efficiency.

- be capable of taking up advanced trainings and studies in application oriented areas, and qualify for doctoral studies.

Subject Examination Regulations for the German-Arab Advanced Professional Master's Course in Renewable Energy and Energy Efficiency for the Middle East and North Africa (MENA) Region at the Electrical Engineering/Computer Science Department of the University of Kassel in cooperation with the Faculty of Engineering Cairo University and the Energy Engineering Department of the National Engineering School of Monastir, University of Monastir, dated January 13, 2016.

I. Common Provisions

§ 1 Scope

The Examination Regulations of the Faculty of Electrical Engineering/Computer Science of the University of Kassel for the Advanced Training German-Arab Master's Course of Study in "Renewable Energy and Energy Efficiency for the Middle East and North Africa (MENA) Region" (REMENA) supplement the General Provisions for Subject Area Examination Rules for Degrees at the Bachelor's and Master's Level at the University of Kassel (AB Bachelor/Master) within the respective valid version.

§ 2 Academic Degree, Type of Profile

(1) The Master's Examination concludes the English language advanced professional course of study "Renewable Energy and Energy Efficiency for the Middle East and North Africa Region".
(2) Based on the passed Master's Examination the Department of Electrical Engineering/Computer Science awards the academic degree "Master of Science".
(3) The type of profile of the Master's course of study is conceived as more practice-oriented.
(4) For the study course semester-by-semester study fees are levied, the amount of which is fixed by the presidency.

§3 Standard Duration of Studies, Start of Studies and Credits

(1) The standard duration of studies including the period for the Master's thesis is 21 months. The 21 months comprise the summer- and winter semester as well as 9 months for writing the Master's thesis.
(2) Start of studies is possible for winter- or summer semester. The summer semester is effected in Kassel, winter term either in Cairo or in Monastir.
(3) The Master's thesis comprises 30 credits. The remaining modules comprise a minimum of 60 credits. Specifications are given in § 7.

§ 4 Board of Examiners

(1) The competent body for decisions in exam-related issues is the examination committee for Renewable Energy and Energy Efficiency for the MENA Region.

(2) The examination committee is formed by representatives of the involved specialties of the department of Electrical Engineering/Computer Science of the University of Kassel. The members of the examination committee are:

- Three professors of the department Electrical Engineering/Computer Science
- One academic employee
- One student member of the Master's course.

(3) The professors, the academic employee as well as the student member are elected by the departmental council.

II. Master's Examination

§ 5 Module examinations

(1) Feasible exam performances are presentations, written and oral exams, discussion contributions, as well as reports and written assignments.

(2) The study-accompanying module examinations may consist of several module partial examinations.

(3) Where a module exam consists of several parts, it is only passed if an overall mark of least "sufficient" (4,0) was achieved.

(4) Failed module examinations can be repeated when the exam is being offered for the next time. In justified individual hardship cases the opportunity for repetitive exam shall be agreed upon individually. The date and time of the repetitive exam are announced by the examination committee.

§ 6 Admission Prerequisites for Master's Studies

(1) Eligible for being admitted to Master's studies is only who

1) has completed a Bachelor's or Diploma or equivalent course of studies with a regular period of study of at least 7 semesters at a University or University of Applied Sciences in the Federal Republic of Germany, or an equivalent University abroad in the subject areas Mathematics, Sciences, or Engineering, or in Computer Science with a minimal overall grade "Good" (2.5), or an equivalent international grade mark, or

2) has completed a Bachelor's or Diploma or equivalent course of studies with a regular period of study of at least 7 semesters at a University or University of Applied Sciences in the Federal Republic of Germany, or an equivalent University abroad in the subject areas law, economics, or social sciences with a minimal overall grade "Good" (2.5), or an equivalent international grade mark, and can proof 10 credits in the subject area Mathematics, Sciences- and Engineering, or Computer Sciences, or

3) has completed a Bachelor's or Diploma or equivalent course of studies with a regular period of studies of at least 6 semesters in the subject areas in accordance with 1. and 2. and produces the missing skills by fulfilling additional module examinations to the extent of 30 credits before registering for Master's thesis, to be determined by the Board of Examiners.

4) Presents a motivation letter and two reference letters.

The examination board may take adjudications deviant from the minimal overall grade of "good" according to section (1) 1. and 2., if the applicant proves above the average course achievements in the previous course of studies.

5) Applicants should additionally submit proof of having at least one year of work experience in a field relevant to the course of study. Included in the relevant areas are i.a. activities in industrial enterprises, services or institutions in the field of solar technology and photovoltaics, wind power, geothermal, hydro power, bioenergy, electrical engineering, mechanical engineering, computer science, natural sciences and mathematics, as well as environmentally compatible building.
   In well founded exceptional cases the examination board may admit applicants with less work-experience.
6) If the applicant who meets the preconditions stipulated in section 1) does not have the technical-mathematical skills required, the examination board may take provisions for an admission under the condition of producing the missing skills by successfully passing qualification modules in the first semester to the extent of up to 30 credits from the following list:

module title	credits	study site
Thermodynamic Basics	10	Cairo
Energy and Thermodynamic Basics	10	Monastir
Engineering Basics	10	Kassel

7) Compliance with the requirements according to (1) is usually determined on the basis of the written application. In cases of doubt selection interviews of about 30 minutes duration can be conducted, the two examiners to be nominated by the examination board.
8) Furthermore, evidence of sufficient knowledge of the English language on the level of B2 of the Common European Framework of Reference for Languages must be presented. This evidence is only needed for applicants whose mother tongue is not English, or previous studies were not completely conducted in English.

§ 7 Examination Components of Master's Degree

The Master's examination consists of the Master's thesis including the Master's colloquium according to § 8 section 5 with 30 credits and module examinations to the extent of a minimum of 60 credits. Students have to earn at least 43 credits from compulsory and a minimum of 17 credits from elective modules.

The Modules in Kassel are:

Compulsory Modules

- Intercultural Competencies 6 Credits
- Practical Aspects of Renewable Energies and Energy Efficiency 7 Credits
- Economic Activities of Germany in the MENA Region 4 Credits
- Project Management 5 Credits

Elective Modules

- Solar Energy Systems 6 Credits
- Wind Energy Technology 6 Credits
- Energy Efficiency and Storage 5 Credits
- Renewable Energy Integration 7 Credits

The Modules in Cairo are:

Compulsory Modules

- Language and Presentation 6 Credits
- Fundamentals of Renewable Energies and Energy Efficiency 7 Credits
- Economic and Ecological Aspects of Renewable Energies and Energy Efficiency 8 Credits

Elective Modules

- Solar Energy Devices 6 Credits
- Bio Energy 4 Credits
- Development of Renewable Energy Projects 5 Credits

The Modules in Monastir are:

Compulsory Modules

- Language and Communication Competencies 6 Credits
- Advanced Energy Engineering 6 Credits
- Energy and Environment 4 Credits
- Management and Engineering Mathematics 5 Credits

Elective Modules

- Solar Energy Subsystems 5 Credits
- Geothermal Energy 5 Credits
- Combined Cooling, Heating and Power (CCHP) 5 Credits

§ 8 Master's Graduation Module

(1) The Master thesis and the Master colloquium form the Master's graduation module. For the Master's graduation module 30 credits are given.

(2) The topic of the Master's thesis (module thesis project) can be issued first if the performance of the examinations modules acc. to § 7 has been produced to the extent of 54 credits.

(3) The duration of the Master's thesis to be prepared after the second semester is six months from the initiation of the topic. The theme of the Master's thesis must be obtained such that it can be worked out within the scheduled period. The topic of the Master's thesis can only be returned once and within the first month.

(4) If the first deadline for submission cannot be met due to reasons for which the candidate cannot be held responsible, the Examination Committee can grant a one-time extension for a maximum of three months, if the candidate applies before the first submission date and the supervisor agrees.

(5) The Master's thesis shall be submitted within the prescribed period in two printed stapled copies and one electronic version to the Board of Examiners.

(6) The Master's thesis is to be presented and defended. The Master colloquium regularly takes place within

one month after the submission of the Master thesis. Beside the candidate the examiners appointed by the participating Universities participate in the colloquium. The overall duration of the colloquium is 30 to a maximum of 50 minutes. The date and time of the Master colloquium is announced two weeks prior to the date at the latest. In case of failing the colloquium the examination committee will determine a repetitive date within once month after the first date of the colloquium. The participation in the colloquium is on the condition that the Master thesis has been marked with "Sufficient" (4,0) at least.

§ 9 Assessment of Examination Performance, Calculation and Weighting of Grades

(1) The overall mark of a module is calculated as arithmetical average of marks weighted from the credits of marks of courses included in the module.

(2) The overall grade of the Master's examination is calculated as credits-weighted arithmetic average from the marks of the modular examinations acc. to § 7.

(3) The marks of all modules will be transferred to the German grading scale in accordance with § 7 acc. to Annex C

Concluding Provisions

§ 10 Coming into Effect

These examination regulations will come into effect on the day after announcement in the bulletin of the University of Kassel.

Done at Kassel on February 23, 2016

Dean of the Electrical Engineering/Computer Science Department

Prof. Dr. sc. techn. Dirk Dahlhaus

Annex A:Sample Study Plan

Annex A.1 Study Mode 1: Cairo / Kassel

Semester	Duration	Site	Study Contents
winter	6 months	Cairo	qualification/compulsory/elective modules
summer	6 months	Kassel	qualification/compulsory/elective modules
winter / summer	9 months	Germany, MENA, etc.	master thesis module

Study Plan Overview - Start in Cairo

		credits																												
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
semester	1 (w)	Language and Presentation						Fundamentals of REEE							Economic and Ecological Aspects of REEE								Elective Modules								
	2 (s)	Intercultural Competencies						Practical Aspects of REEE							Economic Activities of Germany in the MENA Region				Project Management				Elective Modules								
	3 (w)	Thesis Project																													

winter semester (w), summer semester (s)

Start in Cairo - Sample Schedule #1 for Elective Modules with 17 Credits

		credits									
		1	2	3	4	5	6	7	8	9	10
semester	1 (w)	Solar Energy Devices						Bio Energy			
	2 (s)	RE Integration									

winter semester (w), summer semester (s)

Start in Cairo - Sample Schedule #2 for Elective Modules with 21 Credits

		credits										
		1	2	3	4	5	6	7	8	9	10	11
semester	1 (w)	Solar Energy Devices						Bio Energy				
	2 (s)	Energy Efficiency and Storage						Wind Energy Technology				

winter semester (w), summer semester (s)

Study Plan Overview - Start in Kassel

		credits																												
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
semester	1 (s)	Intercultural Competencies						Practical Aspects of REEE							Economic Activities of Germany in the MENA Region				Project Management					Elective Modules							
	2 (w)	Language and Presentation						Fundamentals of REEE							Economic and Ecological Aspects of REEE									Elective Modules							
	3 (s)	Thesis Project																												

winter semester (w), summer semester (s)

Start in Kassel - Sample Schedule #1 for Elective Modules with 17 Credits

		credits										
		1	2	3	4	5	6	7	8	9	10	11
semester	1 (s)	Wind Energy Technology						Energy Efficiency and Storage				
	2 (w)	Solar Energy Devices										

winter semester (w), summer semester (s)

Start in Kassel - Sample Schedule #2 for Elective Modules with 17 Credits

		credits												
		1	2	3	4	5	6	7	8	9	10	11	12	13
semester	1 (s)	Solar Energy Systems						RE Integration						
	2 (w)	Bio Energy												

winter semester (w), summer semester (s)

Annex A.2 Study Mode 2: Monastir / Kassel

Semester	Duration	Site	Study Contents
winter	6 months	Monastir	qualification/compulsory/elective modules
summer	6 months	Kassel	qualification/compulsory/elective modules
winter / summer	9 months	Germany, MENA, etc.	master thesis module

Study Plan Overview - Start in Monastir

		credits																												
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
semester	1 (w)	Language and Communication Competencies						Advanced Energy Engineering						Energy and Environment				Management and Engineering Mathematics					Elective Modules								
	2 (s)	Intercultural Competencies						Practical Aspects of REEE						Economic Activities of Germany in the MENA Region				Project Management					Elective Modules								
	3 (w)	Thesis Project																													

winter semester (w), summer semester (s)

Start in Monastir - Sample Schedule #1 for Elective Modules with 17 Credits

		credits									
		1	2	3	4	5	6	7	8	9	10
semester	1 (w)	Geothermal Energy					Combined Cooling, Heating, and Power				
	2 (s)	RE Integration									

winter semester (w), summer semester (s)

Start in Monastir - Sample Schedule #2 for Elective Modules with 21 Credits

		credits										
		1	2	3	4	5	6	7	8	9	10	11
semester	1 (w)	Geothermal Energy					Combined Cooling, Heating, and Power					
	2 (s)	Wind Energy Technology						Energy Efficiency and Storage				

winter semester (w), summer semester (s)

Study Plan Overview - Start in Kassel

		credits																												
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
semester	1 (s)	Intercultural Competencies						Practical Aspects of REEE							Economic Activities of Germany in the MENA Region				Project Management					Elective Modules							
	2 (w)	Language and Communication Competencies						Advanced Energy Engineering						Energy and Environment					Management and Engineering Mathematics					Elective Modules							
	3 (s)	Thesis Project																												

winter semester (w), summer semester (s)

Start in Kassel - Sample Schedule #1 for Elective Modules with 18 Credits

		credits												
		1	2	3	4	5	6	7	8	9	10	11	12	13
semester	1 (s)	Solar Energy Systems						RE Integration						
	2 (w)	Solar Energy Subsystems												

winter semester (w), summer semester (s)

Start in Kassel - Sample Schedule #2 for Elective Modules with 21 Credits

		credits										
		1	2	3	4	5	6	7	8	9	10	11
semester	1 (s)	Solar Energy Systems						Energy Efficiency and Storage				
	2 (w)	Solar Energy Subsystems					Combined Cooling, Heating, and Power					

winter semester (w), summer semester (s)

Number/Type/Title	Qualification Module Thermodynamic Basics
Name of Module	Thermodynamic Basics
Type of Module	Qualification
Learning Outcome, Skills and Qualification Objectives	• implement the first and second law of thermodynamics on thermal systems • interpret property tables and create energy balances • to analyze power and refrigeration cycle performance • conduct basic principles of heat transfer and its basic modes on energy systems • assess temperature distribution and heat flow regarding heat exchangers and insulations • conduct conservation equations on fluid flow • implement fluid flow dimensional analysis on pressure losses and pumping power requirements • perceive next generation photovoltaic and optoelectronics materials used in photovoltaic applications • interpret advanced membrane materials
Type of Course	EX, K, KO, S, VL+P
Preconditions for Participation in the Module	-
Student Workload	150 hours course attendance 100 hours self-study
Performance Criteria	EX, K, KO, S, VL+P
Preconditions for Participation in the Exam	-
Student Assessment	Written exam, 2 hours
Number of Credits for the Module	10

Number/Type/Title	Qualification Module Engineering Basics
Name of Module	Engineering Basics
Type of Module	Qualification
Learning Outcome, Skills and Qualification Objectives	• analyse electrical circuits and using measuring instruments and sensors • apply principles of energy conversion (mechanical / electrical) • understand the specific terms and problems of control theory • analyse simple linear control systems • calculate flow of forces in static systems • solve simple dynamic issues (e.g. problems between turbines and ground) • understand functions and their differentiation and integration • describe systems based on linear and non-linear operators (deterministic and stochastic) • analyse system design and simulation using numerical methods
Type of Course	EX, K, KO, S, VL+P
Preconditions for Participation in the Module	-
Student Workload	150 hours course attendance 100 hours self-study
Performance Criteria	EX, K, KO, S, VL+P
Preconditions for Participation in the Exam	
Student assessment:	Written exam, 2 hours
Number of Credits for the Module	10

Number/Type/Title	Compulsory Module Language and Presentation
Name of Module	Language and Presentation
Type of Module	Compulsory
Learning Outcome, Skills and Qualification Objectives	• implement basic formulations and expressions of German and Arabic for use in daily life • interpret the concepts of presentation and moderation for efficient meeting organization, discussion and moderation techniques • implement presentation and moderation techniques (suitable material, personal presentation, moderation skills) on a professional level
Type of Course	EX, K, KO, S, VL+P
Preconditions for Participation in the Module	-
Student Workload	90 hours course attendance 60 hours self-study
Performance Criteria	EX, K, KO, S, VL+P
Preconditions for Participation in the Exam	-
Student assessment:	Written exam, 2 hours; presentation and moderation project
Number of Credits for the Module	6

Number/Code	Compulsory Module Fundamentals of REEE
Name of Module	Fundamentals of REEE
Type of Module	Compulsory
Learning Outcome, Skills and Qualification Objectives	• perceive the basics of the different energy forms and conversion technologies • assess conversion efficiencies for different forms of energy • distinguish energy supply and demand patterns • review different energy conservation technologies/opportunities
Type of Course	EX, K, KO, S, VL+P
Preconditions for Participation in the Module	-
Student Workload	105 hours course attendance 70 hours self-study
Performance Criteria	EX, K, KO, S, VL+P
Preconditions for Participation in the Exam	-
Student assessment:	Written exam, 2 hours
Number of Credits for the Module	7

Number/Type/Title	Compulsory Module Economic and Ecological Aspects of REEE
Name of Module	Economic and Ecological Aspects of REEE
Type of Module	Compulsory
Learning Outcome, Skills and Qualification Objectives	• recognize different effects of energy use on environment, society and economy, methods of greenhouse gas balances and concepts for mitigation • distinguish different energy concepts relating to their environmental impacts • assess economic aspects of production, distribution, consumption of energy and energy trade (including sustainability aspects) • interpret economic and administrative rules and regulations, functions and structure of regional, national and international organisations involved in the energy sector • interpret basic economic concepts (e.g. demand supply equilibrium, risk analysis, depreciation) • conduct feasibility studies, concepts of decision making, cost estimation techniques and funding strategies • assign conversion efficiencies for different forms of energy with special respect to implementation in MENA Region
Type of Course	EX, K, KO, S, VL+P
Preconditions for Participation in the Module	-
Student Workload	120 hours course attendance 80 hours self-study
Performance Criteria	EX, K, KO, S, VL+P
Preconditions for Participation in the Exam	-
Student assessment:	Written exam, 2 hours
Number of Credits for the Module	8

Number/Type/Title	Compulsory Module Intercultural Competencies
Name of Module	Intercultural Competencies
Type of Module	Compulsory
Learning Outcome, Skills and Qualification Objectives	• understand the institutional set-up of bilateral and multilateral development cooperation with special reference to the Arab world • work with political, economic and cultural objectives and instruments of German-Arab relation • meta-cognitively reflect communication relevant factors in perception and assessment of situations and critical incidents in every day- and project-related communication • monitor the personal adaptation process • Generate a portfolio of tools for an empathic approach to effectively communicate and work in intercultural teams.
Type of Course	EX, K, KO, S, VL+P
Preconditions for Participation in the Module	-
Student Workload	90 hours course attendance 60 hours self-study
Performance Criteria	EX, K, KO, S, VL+P
Preconditions for Participation in the Exam	-
Student assessment:	Written exam, 2 hours - Presentation, project, written report
Number of Credits for the Module	6

Number/Code	Compulsory Module Practical Aspects of REEE
Name of Module	Practical Aspects of REEE
Type of Module	Compulsory
Learning Outcome, Skills and Qualification Objectives	• understand the design, problems and operation of integrated grids with respect to the specific properties of renewable energies • apply advanced schemes like online-monitoring and forecasting • understand physical and technical aspects of energy flows in buildings • identify heat gains, heat losses and cooling demand of rooms • determine life cycle costs and life cycle assessment of environmental impacts in the building sector • understand the basics of life cycle assessment for different renewable energy sources • Investigate energy costs and to determine roughly costs under different conditions (sizes, boundary conditions etc.) • determine the heat value of fuels and to determine and assess emissions of the burning process
Type of Course	EX, K, KO, S, VL+P
Preconditions for Participation in the Module	-
Student Workload	105 hours course attendance 70 hours self-study
Performance Criteria	EX, K, KO, S, VL+P
Preconditions for Participation in the Exam	-
Student assessment:	Written exam, 2 hours
Number of Credits for the Module	7

Number/Code	Compulsory Module Economic Activities of Germany in the MENA Region
Name of Module	Economic Activities of Germany in the MENA Region
Type of Module	Compulsory
Learning Outcome, Skills and Qualification Objectives	• understand the driving factors of energy costs and how energy pricing can influence supply and demand • read and assess cost-benefit-analyses • reflect key factors, methods and the necessary framework for a company to get into the market of a country
Type of Course	EX, K, KO, S, VL+P
Preconditions for Participation in the Module	-
Student Workload	60 hours course attendance 40 hours self-study
Performance Criteria	EX, K, KO, S, VL+P
Preconditions for Participation in the Exam	-
Student assessment	Written exam, 2 hours
Number of Credits for the Module	4

Number/Code	Compulsory Module Project Management
Name of Module	Project Management
Type of Module	Compulsory
Learning Outcome, Skills and Qualification Objectives	• break down a project into its basic elements • identify specific needs and targets of international projects • investigate success factors for executing RE projects, specifically in the development cooperation between Germany and Arab countries • use the key elements of project management cycle • elaborate a project proposal themselves (in a final workshop) • understand the importance of environmental assessment studies • analyze critically socio-economic effects of RE projects, worldwide as well as regional
Type of Course	EX, K, KO, S, VL+P
Preconditions for Participation in the Module	-
Student Workload	75 hours course attendance 50 hours self-study
Performance Criteria	EX, K, KO, S, VL+P
Preconditions for Participation in the Exam	-
Student assessment:	Written exam, 2 hours
Number of Credits for the Module	5

Number/Code	Compulsory Module Thesis Project
Name of Module	Thesis Project
Type of Module	Compulsory
Learning Outcome, Skills and Qualification Objectives	• write a scientific report and presentation of results in a colloquium • investigate literature and internet based sources • work independently and scientifically
Type of Course	EX, K, KO, S, VL+P
Preconditions for Participation in the Module	Modules passed to the extent of at least 54 credits
Student Workload	740 hours independent research 160 hours writing thesis
Performance Criteria	EX, K, KO, S, VL+P
Preconditions for Participation in the Exam	Performance of the examinations modules acc. to § 7 to the extent of 54 credits
Student assessment	Report and Colloquium
Number of Credits for the Module	30

Number/Code	Elective Module Solar Energy Devices
Name of Module	Solar Energy Devices
Type of Module	Elective
Learning Outcome, Skills and Qualification Objectives	• distinguish solar thermal devices for domestic hot water with respect to radiation circumstances and geographical position • assess design and dimensioning of different solar thermal energy devices for domestic hot water, space and swimming pool heating and air conditioning • recognize operating limits of non-focusing collectors and the need for focusing collectors, the different types of solar concentrators and their relative merits • assign output power, delivery temperatures and performance indices for different kinds of solar concentrator technologies • distinguish the solar radiation on oriented surfaces • perceive the physics of photovoltaic cell materials, production, modules structure and basic electrical characteristics of the solar module
Type of Course	EX, K, KO, S, VL+P
Preconditions for Participation in the Module	-
Student Workload	90 hours course attendance 60 hours self-study
Performance Criteria	EX, K, KO, S, VL+P
Preconditions for Participation in the Exam	-
Student assessment	Written exam; 2 hours
Number of Credits for the Module	6

Number/Code	Elective Module Bio Energy
Name of Module	Bio Energy
Type of Module	Elective
Learning Outcome, Skills and Qualification Objectives	• assess different types of bio energy sources with focus on liquid fuels • evaluate different bio fuels • perceive sources, potentials and possible energetic use of bio waste
Type of Course	EX, K, KO, S, VL+P
Preconditions for Participation in the Module	-
Student Workload	60 hours course attendance 40 hours self-study
Performance Criteria	EX, K, KO, S, VL+P
Preconditions for Participation in the Exam	-
Student assessment	Written exam; 2 hours
Number of Credits for the Module	4

Number/Code	Elective Module Development of Renewable Energy Projects
Name of Module	Development of Renewable Energy Projects
Type of Module	Elective
Learning Outcome, Skills and Qualification Objectives	• plan a renewable energy project, select site and technology • conduct tendering process and licensing • perceive commissioning processes, operation and maintenance practice in RE/EE projects
Type of Course	EX, K, KO, S, VL+P
Preconditions for Participation in the Module	-
Student Workload	75 hours course attendance 50 hours self-study
Performance Criteria	EX, K, KO, S, VL+P
Preconditions for Participation in the Exam	-
Student assessment	Written exam, 2 hours
Number of Credits for the Module	5

Number/Code	Elective Module Solar Energy Systems
Name of Module	Solar Energy Systems
Type of Module	Elective
Learning Outcome, Skills and Qualification Objectives	• understand the use of solar thermal energy for air conditioning • analyse the size of solar thermal plants for air conditioning (as components and as total system) and the connection of the system to the building • reflect the fundamental characteristics and capabilities as well as impacts of concentrating solar power (CSP) stations within national electricity supply schemes • understand the fundamentals of international cooperation for solar electricity export and long-distance transmission • assess the technical and economic potential of CSP in a country and to identify the best sites for project development • select optimal(standalone, decentralized) PV systems according to specific application and resources conditions • estimate the techno-economic performance criteria • implement standard PV simulation software tools for system design
Type of Course	EX, K, KO, S, VL+P
Preconditions for Participation in the Module	-
Student Workload	90 hours course attendance 60 hours self-study
Performance Criteria	EX, K, KO, S, VL+P
Preconditions for Participation in the Exam	-
Student assessment	Written exam, 2 hours
Number of Credits for the Module	6

Number/Code	Elective Module Wind Energy Technology
Name of Module	Wind Energy Technology
Type of Module	Elective
Learning Outcome, Skills and Qualification Objectives	• apply their gained knowledge about the design of different wind turbines resp. single components and their material requirements on specific locations • identify the optimal location for a planned wind farm and to develop it after analyzing the requirements for construction, logistics and grid connection as well as national standards • distinguish the design of different types of Wind Energy Converter and to analyze their function in different control concepts • be aware of different electrical networks and possible problems related with grid integration and grid control • apply mathematical models for control system design and plant simulation
Type of Course	EX, K, KO, S, VL+P
Preconditions for Participation in the Module	-
Student Workload	90 hours course attendance 60 hours self-study
Performance Criteria	EX, K, KO, S, VL+P
Preconditions for Participation in the Exam	-
Student assessment	Written exam; 2 hours
Number of Credits for the Module	6

Number/Code	Elective Module Energy Efficiency and Storage
Name of Module	Energy Efficiency and Storage
Type of Module	Elective
Learning Outcome, Skills and Qualification Objectives	• distinguish different storage technologies and their role for the RE system • compare costs and potentials of EE processes and storage systems • analyze and model industrial EE systems
Type of Course	EX, K, KO, S, VL+P
Preconditions for Participation in the Module	-
Student Workload	75 hours course attendance 50 hours self-study
Performance Criteria	EX, K, KO, S, VL+P
Preconditions for Participation in the Exam	-
Student assessment	Written exam, 2 hours
Number of Credits for the Module	5

Number/Code	Elective Module RE Integration
Name of Module	RE Integration
Type of Module	Elective
Learning Outcome, Skills and Qualification Objectives	• understand the key drivers as well as design principles of the smart grid (communication) • evaluate the communication infrastructure required to set up smart grids • understand the requirements for balancing fluctuating renewable power generation and select solutions for these different requirements • estimate potentials and costs in the control of flexible generators and consumers in domestic and industrial applications • determine bio mass potentials taking into account different bio mass conversion processes and local potentials • analyse the sustainability of the whole value chain
Type of Course	EX, K, KO, S, VL+P
Preconditions for Participation in the Module	-
Student Workload	105 hours course attendance 70 hours self-study
Performance Criteria	EX, K, KO, S, VL+P
Preconditions for Participation in the Exam	-
Student assessment	Written exam, 2 hours
Number of Credits for the Module	7

Annex C:

Annex C: Transfer of Egyptian and Tunisian Scales into the German Grading Scale

The following table shows the transfer of the marks between Cairo University (CU), the University of Monastir (UM) and the University of Kassel (UK)

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CU	UM	UK
100	20	1,0
100	19	1,0
100	18	1,0
100	17	1,0
100	16	1,0
99	15	1,0
98	14,75	1,3
97	14,5	1,3
96	14,25	1,3
95	14	1,3
94	13,75	1,7
93	13,5	1,7
92	13,25	1,7
91	13	1,7
90	12,75	2,0
89	12,5	2,0
88	12,25	2,0
87	12	2,0
86	11,75	2,3
85	11,5	2,3
84	11,25	2,3
83	11	2,3
82	10,95	2,7
81	10,9	2,7
80	10,85	2,7
79	10,8	2,7
78	10,75	3,0
77	10,7	3,0
76	10,65	3,0
75	10,6	3,0
74	10,55	3,3
73	10,5	3,3
72	10,45	3,3
71	10,4	3,3
70	10,35	3,7
69	10,3	3,7
68	10,25	3,7
67	10,2	3,7
66	10,15	4,0
65	10,15	4,0

64	10,15	4,0
63	10,1	4,0
62	10,1	4,0
61	10,1	4,0
60	10,1	4,0
59	10,05	4,0
58	10,05	4,0
57	10,05	4,0
56	10,05	4,0
55	10,05	4,0
54	10	4,0
53	10	4,0
52	10	4,0
51	10	4,0
50	10	4,0
49	9,9	n.b.