Appendix C: Module catalogue

for the study programme Renewable Energies B.Eng.

Industrial Plant Layout	21
Power Drive Technology	22
Automation Technology	24
Bachelor Thesis	25
Business Administration	26
Biochemistry and Microbiology*	28
Biogas and Biorefineries [*]	29
Chemistry*	30
Decentralised Energy Systems	31
Efficient Illumination Technology	32
Electrical Energy Storage and Fuel Cells	34
Electrical Machines	35
Power Systems	37
Electronics	38
Electrical Engineering 1	39
Electrical Engineering 2	40
Electric Traction	42
Energy Efficiency in the Building	44
Building Automation	46
Gender and Diversity: Success Factors for Companies	48
Fundamentals of Electrical Energy Technology	50
Computer Science 1	51
Computer Science 2	53
Investment and Financing	55
Colloquium	57
Power Electronics	58
Mathematics 1	60
Mathematics 2	62
Metrology	64
Please note: The German version of this document is the legally binding version. The English translation provided here is for information purposes only.	

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*Translations of these module descriptions are currently not available.

Indu	strial Plan	nt Layout							APL	
Ident numb	ification per:	Workload:	Credits:	Study	/ semes		Frequency offer	of the	Duratio	n:
1010		150 h	150 h 5		4th or 6th sem.			Annual (Summer)		ester
1	Course:		Planned group	sizes	Scop	e	Actual co time / classroor teaching	m	Self-stud	dy
	Lecture		60 students		2	weekly hours		h	45	h
	Sem. less	sons	30 students		1	weekly hours	15	h	22	h
	Exercise		20 students		1	weekly hours	15	h	23	h
	Practical	or seminar	15 students		0	weekly hours	0	h	0	h
	Supervise	ed self-study	60 students		0	weekly hours	0	h	0	h
	systema critically	atically evalua y question th	npletion of the ate a planning e solution. Thi he students ca	g task ir s incluc	low v les the	voltage a e structu	and med iring of th	ium/high	n voltage	and to
3	energy electrica energy	production p al energy sys generation sy	n to plant plann lants using the tems and elec vstems. Current upply systems.	e exam trical en	ple of erav a	biogas p eneratio	olants. Pla on system	anning a s, especi	nd projec ially rege	cting of nerative
4	Forms of	teaching:								
		and seminar								
5	· · · ·	ion requirement								
	Formal:	None								
-	Content:	assessment:	9							
6			or oral examina	ation						
7	Prerequis	site for the awa	rd of credit point pass and cours	S:	emon	ŀ				
8			le (in the followin							
	Electrica		g B.Eng., Renev	0 ,		,	andIndus	strial Engi	neeringa	nd
9		ce of the grade	e for the final grad	de:						
10		coordinator:								
-	Prof. Dr.		is Loesenbeck							
11	Literatu	re will be ann Ible Energies	ounced at the k study program	-	-			cient Sys	stems: Ele	ctive
12	Language									
	Germar	ı								

POW	er Drive T	echnology							ATR		
Ident numb	ification	Workload:	Credits:	lits: Study semester:			Frequenc offer	y of the	Duration: 1 semester		
1013		150 h	5	5 4th o seme			Annual (Summer)				
1	Course:	1	Planned group sizes		Scop	Scope		Actual contact time / classroom teaching		ју	
	Lecture		60 students		2	weekly hours		h	45	h	
	Sem. less	sons	30 students		1	weekly hours	15	h	22.5	h	
	Exercise		20 students		0	weekly hours	0	h	0	h	
	Practical	or seminar	15 students		1	weekly hours	15	h	22.5	h	
	-	ed self-study outcomes/cor	60 students		0	weekly hours	0	h	0	h	
	frec	quency range sic boundary /es.	riable-speed c e and evaluate conditions for t	the resu	lting be	ehaviour	Studen	ts will be a	bletoide	entify	
	Control	Space vector coordinates Space vector coordinates Information of technology f Transmissio Overshoot ra Frequency of Realization of Cascade co	on drive desigr	on of the on of the n and dir frequen es, phas nethod, a e drive c	e synch e async mensic icy resp e reser optimu controls	ronous r hronous ning conse, N ve and p m amou s with mic	machin yquist st penetrati nt and sy	e in stator- ability crite on frequer vmmetry	- and roto		
		teaching: , sem. lesson	s lessons with e	exercise	es, prac	ctical cou	irse				
4											
4		Mod	e lules:	s (105.9)·	Formal: None						
5	Participat Formal: Content: Forms of Written	None Mod Elect assessment: examination	e Iules: trical Machine: or oral examina	ation							
5	Participat Formal: Content: Forms of Written Prerequis Module	None Mod Elec assessment: examination site for the awa examination	e Iules: trical Machine:	ation ts: se asse:	ssmen						

9	according to BRPO
10	Module coordinator:
	Prof. DrIng. Andreas Bünte
11	Other information:
	Literature will be announced at the beginning of the course.
12	Language:
	German

Auto	omation T	echnology							AT		
Iden [:] num	tification ber:	Workload:	Credits:	Stud	y semes		Frequenc [.] offer	y of the	Duratio	Duration:	
1315)	150 h	5	3rd :	sem.		Annual (Winter)		1 sem	ester	
1	Course:		Planned group	Planned group sizes		Scope		Actual contact time / classroom teaching		dy	
	Lecture		60 students		2	weekly hours	30	h	45	h	
	Sem. less	sons	30 students		1	weekly hours	15	h	22.5	h	
	Exercise		20 students		0	weekly hours	0	h	0	h	
	Practical	or seminar	15 students		1	weekly hours	15	h	22.5	h	
	Supervise	ed self-study	60 students		0	weekly hours	0	h	0	h	
	skills for	r the design a	liscrete or conti and implement nd diagnosis of	ation of	discre	te-event	controls	as well a	-	-	
3	Contents							-			
3	- Ba - D au - Ba au - H lis - Sy - O	asic concept escription of utonomous a ehaviour of d utomata, inpu euristic contr st (AWL) and stematic de observation a	s of automation discrete-even utomata, stanc eterministic an ut/output autom rol design and i step chains. sign of discrete nd diagnosis of	n techno tsystem dard auto d non-c nata anc mpleme e-event	ology a ns by d omata, determi l Petrir entation contro	nd syste eterminis input/ou nistic au nets. n of the c llers bas	ms theor stic and n tput auto tonomou ontrol lav ed on a n	y on-dete omataand usautoma wby mea	d Petri net ata, standa ans of app	ard lication	
3	- Ba - D au - Ba au - Ha lis - Sy - O	asic concept escription of utonomous a ehaviour of d utomata, inpu euristic contr st (AWL) and ystematic de observation a	discrete-even utomata, stanc eterministic an ut/output autom rol design and i step chains. sign of discrete nd diagnosis of	n techno tsystem dard auto nata anco mpleme e-event f discret	ology a omata, determi determi d Petrir entation contro te-even	nd syste eterminis input/ou nistic au nets. n of the c llers bas nt system	ms theor stic and n tput auto tonomou ontrol lav ed on a n	y on-dete omataand usautoma wby mea	d Petri net ata, standa ans of app	ard lication	
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Bac	helor Thes	sis								BA	
lden num	tification ber:			Study	semes		Frequenc offer	y of the	Durati	on:	
129			12 6		6tho	6thor7thsem.		each se	mester	12 we	eks
1	Course:		Planned grou	up size	es	Scop	e	Actual time / classro teachin		Self-stu	dy
	Lecture		60 students			0	weekly hours	0	h	360	h
	Sem. less	sons	30 students			0	weekly hours	0	h	0	h
	Exercise		20 students			0	weekly hours	0	h	0	h
	Practical	or seminar	15 students			0	weekly hours	0	h	0	h
	Supervise	ed self-study	60 students			0	weekly hours	0	h	0	h
3	practice subject	e-oriented ta -specific de ng to scienti	hesis, each c sk from his/h tails and in ic methods.	er su	ubject	t area	within a	specifie	ed period	d of time,	both in its
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3	practice subject accordi Contents The bac enginee It should as a writ Forms of	e-oriented ta -specific de ng to scienti : chelor thesis ering technol d deal with th ten paper. teaching:	sk from his/h tails and in fic methods. is usually an ogytask. e subject mat	er su the i inde	ibject interc	t area discipl dent ir	within a inary cor westigat	specifie ntexts, v	ed perioc working an engir	d of time, l independ	both in its lently and sience or
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	ness Adm	ninistration							BW	
dent	ntification Workload		Credits:	Study	y seme:	ster:	Frequen	cy of the	Duratio	n:
numk 1024		150 h	5 3rd		or 5th sem.		offer Annual (Winter)		1 semester	
1	Course:		Planned group sizes		Scop	e	Actual time / classro teachir		Self-stud	dy
	Lecture		60 students		3	weekly hours	45	h	67.5	h
	Sem. less	sons	30 students		1	weekly hours	15	h	22.5	h
	Exercise		20 students		0	weekly hours	0	h	0	h
	Practical	or seminar	15 students		0	weekly hours	0	h	0	h
	Supervise	ed self-study	60 students		0	weekly hours	0	h	0	h
	calculat	ion methods	in a target-orie							
3	Contents		ots of business						nomic actio	on
3		Basic concep Overview of t economy and Corporate go	ots of business he entrepreneu d information eo pals and corpor ots of private ar	adminis urial fun conomy rate key	stratior ctiona / level	n/basic I areas o s/key fig	principle f the go	es of ecor ods econ		
3	• • • • • • • • • • • • • • • • • • •	Basic concep Overview of t economy and Corporate go Basic concep Forms of corp teaching:	ots of business he entrepreneu d information eo pals and corpor ots of private ar	adminis urial fun conomy rate key nd comi	stratior ctiona / level figure mercia	n/basic l areas o s/key fig Ilaw	principle f the go gure sys	es of ecor ods econ		
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4 5 6	Forms of Lecture Participat Formal: Content: Forms of Written Prerequis Module	Basic concep Overview of t economy and Corporate go Basic concep Forms of corp teaching: , sem. lesson: ion requirement assessment: examination, ite for the awa examination	ets of business he entrepreneu d information ed pals and corpor ots of private ar porate law s with case stud hts:	adminis urial fun conomy rate key nd comi dies / ca	stratior ctiona / level figure mercia ase stu	n/basic l areas o s/key fig I law dies/ex	principle f the go gure sys ercises	es of econ ods econ stems	omy, finan	
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	Forms of Lecture Participat Formal: Content: Forms of Written Prerequis Module Applicatio Electrica B.Eng. a Importan accordi	Basic concep Overview of t economy and Corporate go Basic concep Forms of corp teaching: , sem. lessons ion requirement assessment: examination, site for the awa examination on of the modu al Engineerin and Renewab	ots of business he entrepreneu d information ed pals and corpor ots of private ar porate law s with case stud nts: combination ex rd of credit points pass le (in the followin g B.Eng, Engine	adminis urial fun conomy rate key nd comi dies / ca dies / ca dies / ca	stratior ctiona / level figure mercia ase stu	n / basic l areas o s / key fig Ilaw dies / ex erforman	principle f the go gure sys ercises ce exar	es of ecor ods econ stems	omy, finan	ninatior

	Literature will be announced at the beginning of the course.
12	Language:
	German





Dec	centralised	d Energy Syst	ems						DEC		
lder num	tification	Workload:	Credits:	Stud	y seme		Frequence	cy of the	Duratio	on:	
104		150 h	5	5th:	5th sem.			offer Annual (Winter)		ester	
1	Course:	1	Planned group	sizes	Scop	be	Actual time / classro teachir		Self-stu	dy	
	Lecture		60 students		2	weekly hours		h	45	h	
	Sem. less	sons	30 students		1	weekly	15	h	22.5	h	
	Exercise		20 students		0	weekly hours	0	h	0	h	
		or seminar	15 students		1	weekly hours	15	h	22.5	h	
	Supervise	ed self-study	60 students		0	weekly hours	0	h	0	h	
	They are familiar with combined heat and power (CHP) technology plants and can calculat evaluate and analyse the processes. They are familiar with the basic interrelationships f modelling decentralised energy systems and can assess the reliability of energy supply system										
	evaluate modelli	e and analys ngdecentrali	se the process	eat and es. The	ey are	r (CHP) t familiar	echnolc with the	gy plants basic ir	s and can nterrelation	nships f	
3	evaluate modelli Contents	e and analys ngdecentrali ::	se the process sedenergy sys	eat and es. The temsar	powe ey are nd can	r (CHP) t familiar assessth	echnold with the ne reliab	ogy plants basic ir ility of ene	s and can nterrelation	nships f	
3	evaluate modelli Contents Structur	e and analys ngdecentrali :: re and functio	se the process sedenergy sys	eat and es. The temsar	powe ey are nd can a gy mar	r (CHP) t familiar assessth ket (pow	echnolc with the ne reliab	ogy plants e basic ir lity of ene ange).	s and can nterrelation ergy suppl	nships f	
3	evaluate modelli Contents Structur Design	e and analys ng decentrali :: re and functio and structure	se the process sedenergy sys on of the Germa e of centralised	eat and es. The temsar an energ	powe by are nd can gy mar ntralise	r (CHP) t familiar assessth ket (pow d energy	echnolc with the ne reliab er excha y supply	egy plants basic ir lity of ene ange). systems.	s and can nterrelation ergy supply	nships f ysystem	
3	evaluate modelli Contents Structur Design Working	e and analys ng decentrali re and function and structure g machines for	se the process sedenergy sys on of the Germa e of centralised or combined he	eat and es. The temsar an energ	powe by are nd can gy mar ntralise	r (CHP) t familiar assessth ket (pow d energy	echnolc with the ne reliab er excha y supply	egy plants basic ir lity of ene ange). systems.	s and can nterrelation ergy supply	nships f ysystem	
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	dentification Workloa number:						y semes		Frequenc offer	y of the	Duratic	n:
105		150 h	sem.				Annual (Summe	er)	1 sem	ester		
1	Course:		Planned group	sizes	Scop	e	Actual o time / classroo teaching	om	Self-study			
	Lecture		60 students		2	weekly hours		h	45	h		
	Sem. les	sons	30 students		1	weekly hours	15	h	22.5	h		
	Exercise		20 students		0	weekly hours	0	h	0	h		
	Practical	l or seminar	15 students		1	weekly hours	15	h	22.5	h		
		ed self-study g outcomes/con	60 students		0	weekly hours	0	h	0	h		
	Students understand the basic structure of lighting systems and their components. They pla lighting systems, e.g. with simulation software, and compare the results with real practic examples or those of the demonstration situated in the lighting technology laboratory Bielefeld University of Applied Sciences. The students can classify the results in the state research and development.								ratory at			
3	Contents	6:						-				
3	Contents - L - P - L E - L - L - N P - Ir	s: ight and basic hotometric m ight sources: roperties and uminaires: lements of lig uminaire requ ighting desig feasurement hotometric an hetelligent light	c photometric c easurements characteristic ht control irements and p nusing simulati technology: nd radiometric p control	values o principle on proç parame	of lamp es (e.g. grams sters (lig	os and lu indoor a ght meas	nd outdo	por lumin		sphere)		
3	Contents - L - P - L - L - L - L - L - L - M - Ir - Forms of	ight and basic hotometric m ight sources: roperties and uminaires: lements of lig uminaire requ ighting desig feasurement hotometric ar hotometric ar ntelligent light nergy consid f teaching:	c photometric c easurements characteristic ht control irements and p nusing simulati technology: nd radiometric p control erations accord	values o principle on prog parame ding to a	of lamp es(e.g. grams eters (lig applica	os and lu indoor a ght meas able stan	nd outdo	por lumin		sphere)		
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12	Language:
	German

Elec	trical Ene	rgy Storage a	and Fuel Cells						EEB	
Ident numb	ification per:	Workload:	Credits:	Stud	y seme		Frequency offer	of the	Duratio	n:
1056			5	5th	sem.		Annual (Winter)		1 sem	ester
1	Course:	ourse: Planned group sizes) sizes	Scope		Actual contact time / classroom teaching		Self-study	
	Lecture		60 students		2	weekly hours	30	h	45	h
	Sem. less	sons	30 students		1	weekly hours	15	h	22.5	h
	Exercise		20 students		0	weekly hours	0	h	0	h
		or seminar	15 students		1	weekly hours	15	h	22.5	h
2	-	ed self-study outcomes/con	60 students		0	weekly hours	0	h	0	h
	basics of able to	of storage and design and c	ence between d retrieval and optimally dime o the fundamer	the struension a	cture o possib	f storage le energ	y storage	Student system	ts in thism for a spe	odule are cific task
3	flywhee storage optimal	al basics of se el mass, pump according to design and d	lected storage bed storage, su p power and e limensioning o ucture and cla	ipercon energy s f storag	ducting torage e syste	g magne Applica ms.	tic energy ation exa	y storage mples of	e). Classifi	cation of
4		teaching:	s with exercise	e and n	ractica					
5	Participat Formal: Content:	tion requirement None None	nts: Ə							
6	Forms of	assessment: or oral exami	nation; in each	n case w	ith pre	iminary e	examinati	on perfo	rmance	
7	Prerequis Module	site for the awa examination	rd of credit poin pass and cour	ts: rse asse	ssmen	t				
8			ile (in the followir g B.Eng. and R				ng.			
9	Importan accordi	ce of the grade	e for the final gra							
10	Prof. Dr.	coordinator: Ing. Jens Ha	aubrock							
11	Literatu	ormation: re will be ann	ounced at the	beainni	na of th					
	Language				9	ie course				

Elec	trical Mac	chines							EM	
	tification	Workload:	Credits:	Stud	y seme		Frequence	cy of the	Duratio	on:
numl 1059			5	3rd o	or 5th s	sem.	^{offer} Annual (Winter)		1 sem	ester
1			Planned group	Scop	be	Actual contact time / classroom teaching		Self-study		
	Lecture		60 students		2	weekly hours		h	45	h
	Sem. less	sons	30 students		1	weekly hours	15	h	22.5	h
	Exercise		20 students		0	weekly hours	0	h	0	h
	Practical	or seminar	15 students		1	weekly hours	15	h	22.5	h
	Supervise	ed self-study	60 students		0	weekly hours	0	h	0	h
		al machines,	udents will be al as well as to de		-		-			
3		:	rials, insulation (-				energyet	fficiencyc	lasses,
3	Fundan multi-p Transfo •	: hentals: mate hase systems rmers (single Design, mo Open-circ transforme	rials, insulation of -phase and thro ode of operatio suit and short-c	classes ee-pha n,mode	; opera se) els and	ating moo	des and	it diagran	ns	
3	Fundam multi-p Transfo • • • • •	: hentals: mate hase systems rmers (single Design, mo Open-circ transforme chines Design, mo Operating	rials, insulation of -phase and thro ode of operatio suit and short-c ers ode of operatio behaviour, incl	classes ee-pha n, mode ircuit te n, mode uding fi	, opera se) els and sts, pa els and eld we	ating moo l equivale rameter o l equivale akening	des and ent circu determin ent circu	it diagran nation, pa	ns ırallel circu	
3	Fundam multi-p Transfo • • • • •	nentals: mate hase systems rmers (single Design, mo Open-circ transforme chines Design, mo Operating on machines (Stator wino Equivalent	rials, insulation of -phase and thre ode of operatio ouit and short-c ers ode of operatio behaviour, incl synchronous a ding, lining and circuit diagram	classes ee-pha ircuit te n, mode uding fi nd asyr inductions, point	, opera se) els and els and eld we nchron on sha ter diag	ating mod l equivale rameter o l equivale akening ous mac ft, torque grams ar	des and ent circu determin ent circu hines) e and vol nd curren	it diagran hation, pa it diagran tage form	ns irallel circu ns nation	
3	Fundam multi-p Transfo DC mad Inductio	nentals: mate hase systems rmers (single Design, mo Open-circ transforme chines Design, mo Operating on machines(Stator wino Equivalent Applicatio teaching:	rials, insulation of -phase and three ode of operation suit and short-c ers ode of operation behaviour, incl synchronous a ding, lining and	classes ee-pha ircuit te ircuit te uding fi nd asyr inductions, point ng and c	, opera se) els and sts, pa els and eld we nchron on sha ter dia operati	ating moo l equivale rameter o l equivale akening ous mac ft, torque grams ar ng limits	des and ent circu determin ent circu hines) e and vol nd curren	it diagran hation, pa it diagran tage form	ns irallel circu ns nation	
	Fundam multi-p Transfo DC mad Inductio	nentals: mate hase systems rmers (single Design, mo Open-circ transforme chines Design, mo Operating on machines(Stator wino Equivalent Applicatio teaching:	rials, insulation of phase and three ode of operatio out and short-c ers ode of operatio behaviour, incl synchronous a ding, lining and circuit diagram ns, speed settir s with exercises nts:	classes ee-pha ircuit te ircuit te uding fi nd asyr inductions, point ng and c	, opera se) els and sts, pa els and eld we nchron on sha ter dia operati	ating moo l equivale rameter o l equivale akening ous mac ft, torque grams ar ng limits	des and ent circu determin ent circu hines) e and vol nd curren	it diagran hation, pa it diagran tage form	ns irallel circu ns nation	
4	Fundam multi-p Transfo DC mad Inductio Forms of Lecture Participat	nentals: mate hase systems rmers (single Design, mo Open-circ transforme chines Design, mo Operating on machines(Stator wind Equivalent Applicatio teaching: , sem. lessons tion requireme Mod 1071 1074	rials, insulation of phase and three ode of operatio out and short-c ers ode of operatio behaviour, incl synchronous a ding, lining and circuit diagram ns, speed settir s with exercises nts:	classes ee-pha ircuit te ircuit te uding fi nd asyr inductions, point ag and co s, practions neering ineering	, opera se) els and sts, pa els and eld we nchron on sha ter dia operati ical co	ating moo l equivale rameter o l equivale akening ous mac ft, torque grams ar ng limits	des and ent circu determin ent circu hines) e and vol nd curren	it diagran hation, pa it diagran tage form	ns irallel circu ns nation	
4 5 6	Fundam multi-p Transfo DC mad Inductio Forms of Lecture Participat Formal: Content:	nentals: mate hase systems rmers (single Design, mo Open-circ transforme chines Design, mo Operating on machines(Stator wind Equivalent Applicatio teaching: , sem. lesson: tion requireme None None 1071 1074 1075 assessment: examination	rials, insulation of phase and thre ode of operatio behaviour, incl synchronous a ding, lining and circuit diagram ns, speed settir s with exercises nts: e ules: Electrical Engi Electrical Engi Electrical Engi Electrical Engi Electrical Engi	classes ee-pha ircuit te ircuit te uding fi nd asyr induction s, praction neering ineering ineering	, opera se) els and sts, pa els and eld we nchron on sha ter dia operati ical co	ating moo l equivale rameter o l equivale akening ous mac ft, torque grams ar ng limits	des and ent circu determin ent circu hines) e and vol nd curren	it diagran hation, pa it diagran tage form	ns irallel circu ns nation	
4 5	Fundam multi-p Transfo DC mad DC mad Inductio Forms of Lecture Participat Formal: Content:	inentals: mate hase systems rmers (single Design, mo Open-circ transforme chines Design, mo Operating on machines(Stator wind Equivalent Applicatio teaching: , sem. lesson: tion requireme None None Equireme None Stator vind Equivalent Applicatio teaching: , sem. lesson: tion requireme None Equireme None Stator vind Equivalent Applicatio teaching: , sem. lesson: tion requireme None Equireme None Stator vind teaching: , sem. lesson: tion requireme None Stator vind tor tor tor tor tor tor tor tor tor tor	rials, insulation of -phase and thre ode of operatio suit and short-c ers ode of operatio behaviour, incl synchronous a ding, lining and circuit diagram ns, speed settir s with exercises nts: e ules: Electrical Engi Electrical Engi Electrical Engi Electrical Engi	classes ee-pha n, mode ircuit te n, mode uding fi nd asyr induction s, praction s, praction ineering ineering ineering ineering ineering is asses	, opera se) els and els and eld we nchron on sha ter dia operati ical co	ating mod l equivale rameter o l equivale akening ous mac ft, torque grams ar ng limits urse	des and ent circu determin ent circu hines) e and vol nd curren	it diagran hation, pa it diagran tage form	ns irallel circu ns nation	

9	according to BRPO
10	Module coordinator:
	Prof. DrIng. Andreas Bünte
11	Other information:
	Literature will be announced at the beginning of the course.
12	Language:
	German

Pov	ver Systen	ns							ENE	
	tification	Workload:	Credits:	Study	/ semes		Frequency	y of the	Duratio	on:
106	ber: 0	150 h	5	6th s	sem.		^{offer} Annual (Summer)		1 semester	
1	Course:		Planned group	sizes	Scop	e	Actual c time / classroc teaching	m	Self-stud	dy
	Lecture		60 students		2	weekly hours		h	45	h
	Sem. less	sons	30 students		1	weekly hours	15	h	22.5	h
	Exercise		20 students		0	weekly hours	0	h	0	h
	Practical	or seminar	15 students		1	weekly hours	15	h	22.5	h
	Supervise	ed self-study	60 students		0	weekly hours	0	h	0	h
	control.		nd assess the g			-				
	control. They ca	an describe th	nd assess the g ne structure of a or complex ene	contro	lsyste	m and ar				
3	Control. They ca protect Contents Normal system Operat	an describe th ion concept f s: isation to rela s and networl ion of electric	ne structure of a	a contro ergy sup ata (pe ction an orks, ma	l syste oply sy r unit d cont ains fre	m and an stems. values), rol techr quency i	e able to calculati pology. regulatio	design a on of en n, symm	and calcula hergy trans etrical sho	ate a gr smissio
	Control. They ca protect Contents Normal system Operat currents	an describe th ion concept f s: isation to rela s and network ion of electric s, symmetrica f teaching:	ne structure of a or complex ene ated network d ks, Mains protec al supply netwo al components,	a contro ergy sup ata (pe ction an orks, ma handlin	l syste oply sy r unit d cont ains fre g of as	m and are stems. values), rol techr quency i ymmetrie	e able to calculati pology. regulatio	design a on of en n, symm	and calcula hergy trans etrical sho	ate a gr smissio
3 4 5	Control. They ca protect Contents Normal system Operat currents Forms of Lecture	an describe th ion concept f s: isation to rela s and network ion of electric s, symmetrica f teaching:	ated network d ks, Mains protect al supply network al components, s with exercises nts:	a contro ergy sup ata (pe ction an orks, ma handlin	l syste oply sy r unit d cont ains fre g of as	m and are stems. values), rol techr quency i ymmetrie	e able to calculati pology. regulatio	design a on of en n, symm	and calcula hergy trans etrical sho	ate a gr smissio
4	Control. They ca protect Contents Normal system Operaticurents Forms of Lecture Participa Formal: Content:	an describe th ion concept f isation to rela s and network ion of electric s, symmetrica teaching: e, sem. lesson tion requireme None	ated network d ks, Mains protect al supply network al components, s with exercises nts:	a contro ergy sup ata (pe ction an orks, ma handlin s and pr	l syste oply sy r unit d cont ains fre g of as ractica	m and ard stems. values), d rol techr quency i ymmetrie	e able to calculati ology. regulatio es, neutra	design a on of en n, symm	and calcula hergy trans etrical sho	ate a gr smissio
4 5 6	Control. They ca protect Contents Normal system Operat currents Forms of Lecture Participa Formal: Content: Forms of Written Prerequis	an describe th ion concept f isation to rela s and network ion of electric s, symmetrica teaching: e, sem. lesson tion requireme None fassessment: or oral exami site for the awa	ne structure of a or complex ene ated network d ks, Mains protec al supply netwo al components, s with exercises nts: a damentals of En ination; in each ard of credit points	ata (pe ction an orks, ma handlin s and pr hergy Te case wi s:	l syste oply sy r unit d cont ains fre g of as ractica echnol th prel	m and an stems. values), rol techr quency i ymmetric l course ogy (109 iminary e	e able to calculati nology. regulatio es, neutra	design a on of en n, symm al point tr	ergy trans etrical sho reatment.	ate a gr smissio
4 5 6 7	control. They ca protect Contents Normal system Operat currents Forms of Lecture Participa Formal: Content: Forms of Written Prerequis Module	an describe the ion concept for isation to relative s and network ion of electrices, symmetrices is sem. lesson tion requirement is sem. lesson for oral examination or oral examination on of the mode	ated network d ated network d ks, Mains protect al supply network al components, s with exercises nts: e damentals of En and of credit points pass with prelin ule (in the followin	ata (pe ction an orks, ma handlin s and pr ergy Te case wi s: minary e	l syste oply sy r unit d cont ains fre g of as ractica echnol th prel	m and an stems. values), rol techr quency i ymmetric l course ogy (109 iminary e ation	e able to calculati nology. regulatio es, neutra	design a on of en n, symm al point tr	ergy trans etrical sho reatment.	ate a gr smissio
4 5 7 8	control. They ca protect Contents Normal system Operaticure Forms of Lecture Participa Formal: Content: Forms of Written Prerequis Module Renewa Importan	an describe the ion concept for isation to related s and network ion of electricated s, symmetricated ion of electricated s, sem. lesson Function Function f assessment: or oral examination on of the modulated able Energies ince of the grade	ated network d ated network d ks, Mains protect al supply network al components, s with exercises nts: e damentals of En and of credit points pass with prelin ule (in the followin	a contro ergy sup ata (pe ction an orks, ma handlin s and pr s and pr case wi s: minary e g study	l syste oply sy r unit d cont ains fre g of as ractica echnol th prel	m and an stems. values), rol techr quency i ymmetric l course ogy (109 iminary e ation	e able to calculati nology. regulatio es, neutra	design a on of en n, symm al point tr	ergy trans etrical sho reatment.	ate a gr smissio
4 5 6 7 8 9	Control. They ca protect Contents Normal system Operat currents Forms of Lecture Participa Formal: Content: Forms of Written Prerequis Module Applicatio Renewa	an describe the ion concept for isation to related s and network ion of electric s, symmetricated tion of electric s, symmetricated tion requireme None tion requireme None fassessment: or oral exami- site for the award examination on of the mode able Energies ince of the grade ing to BRPO coordinator:	ated network d ated network d ks, Mains protect al supply network al components, swith exercises nts: e damentals of En ination; in each ard of credit points pass with prelin ule (in the followin s B.Eng. e for the final grad	a contro ergy sup ata (pe ction an orks, ma handlin s and pr s and pr case wi s: minary e g study	l syste oply sy r unit d cont ains fre g of as ractica echnol th prel	m and an stems. values), rol techr quency i ymmetric l course ogy (109 iminary e ation	e able to calculati nology. regulatio es, neutra	design a on of en n, symm al point tr	ergy trans etrical sho reatment.	ate a gr smissio
4	Control. They ca protect Contents Normal system Operaticure Participa Forms of Lecture Participa Formal: Content: Forms of Written Prerequis Module Renewa Importan accordi Module of Prof. Dr	an describe the ion concept for isation to relate s and network ion of electric s, symmetricate teaching: e, sem. lesson tion requireme None fassessment: or oral exami- site for the aware examination on of the modu- able Energies ing to BRPO coordinator: Ing. Jens Ha formation: ure will be anne programme Re-	ated network d ated network d ks, Mains protect al supply network al components, swith exercises nts: e damentals of En ination; in each ard of credit points pass with prelin ule (in the followin s B.Eng. e for the final grad	a contro ergy sup ata (pe ction an orks, ma handlin s and pr bergy Te case wi s: minary e g study de:	l system oply sy r unit d cont ains fre g of as ractica th prel examin program	m and are stems. values), r rol techr quency i ymmetric l course ogy (109 iminary e ation nmes)	e able to calculati nology. regulatio es, neutra 7) examinati	design a on of en n, symm al point tr on perfo	ergy trans etrical sho reatment.	ate a gr smissio rt-circa

Elec	tronics									ELR	
Iden	tification	Work	load:	Credits:	Stud	y seme	ster:	Frequen	cy of the	Duratio	on:
num		15.01	_		0			offer Annual		4	4
106	064 150 h		n	5	∠na	sem.		(Summer)		1 sem	ester
1	Course:	<u> </u>		Planned grou	Scope		Actual contact time / classroom		Self-study		
	Lecture			60 students		2	weekly	teachir 30	ng h	45	h
	Sem. less	sons		30 students		1	hours weekly	15	h	22.5	h
	Exercise			20 students		0	hours weekly hours	0	h	0	h
	Practical	or sem	inar	15 students		1	weekly hours	15	h	22.5	h
	Supervise	ed self-	study	60 students		0	weekly	0	h	0	h
2	Learning	outcon	nes/com	petences:			licare				
	The stu	idents	know [·]	the elementa	ary interi	elatior	nships of	electro	onics, in	particular	the mos
	importa	nt con	nooner	nts and basic	circuits	used i	n electro	onics. Th	nev have	mastered	the mo
	-		•	nd tools to inc					•		
	Commo	IIIIeu	1005 ai		iepender	niy ue:	synanu	anaiyse	election	CSYSTEMS	
3	Contents	:									
	- C	onduc	tion me	echanism: me	etalliccor	nductic	n, pure a	anddop	edsemic	onductors	
	- Fu	undam	entals	of semicondu	uctor phy	vsics					
	- D	iodes:									
	Pa	arame	ters, dia	odetypes, ma	odels, cha	aracte	ristics an	d data s	heets		
			r circuit								
	V	oltage	multipl	ier							
		ransist									
				ing principle,	tvpes.ch	aracte	ristic cur	vesanc	ldatashe	ets	
		-	-	sation and co							
		-		nt stabilisation							
		•		witches			1				
4	Forms of										
				s with exercis	es and p	ractica	l course				
5	Participat	tion rec									
	Formal:		None								
	Content:		None)							
6	Forms of			action in as -	hoccorr	ithner	iminer		tion	ormones	
7				nation; in eac rd of credit poi		inpre	n ninary e	stanning	auonpeno	Jinance	
1				pass and cou		ssmen	t				
8				le (in the follow							
	Renewa	ableEn	ergies	B.Eng.							
9				for the final gr	ade:						
	accordi	<u> </u>									
10	Module of Dr				ماللد						
44	Other inf			wenzfeier-H	elikamp						
11	Literatu	re will l		ounced at the	ebeginni	ng of tł	ne course	Э.			
12	Languag										
	Germar	I									

Eleo	ctrical Eng	gineering i								ET1	
	itification	Workload:	Credits:	Stud	y seme		Frequenc offer	y of the	Duratio	on:	
107		150 h	5	1st s	em.		Annual (Winter)		1 sem	ester	
1	Course:		Planned group sizes		Scope		Actual contact time / classroom teaching		Self-stu	Self-study	
	Lecture		60 students		2	weekly hours	30	h	45	h	
	Sem. les	sons	30 students		1	weekly hours	15	h	22.5	h	
	Exercise	9	20 students		0	weekly hours	0	h	0	h	
	Practical	l or seminar	15 students		1	weekly hours	15	h	22.5	h	
	Supervis	ed self-study	60 students		0	weekly hours	0	h	0	h	
	1							tasks. T			
3	them.		ic fields and ca	an indep			e and ap		•	sks set f	
3	them. Contents Lecture Basic p electric electric Practic - Volta - Temp	s: e and seminar ohysical terms cal circuits, ec current field, als: ge source perature-dep		enginee s, calcu gnetic fi	ring, tw	ntly derive	our-terr	oply solu	tions to tas	ulation c	
3	them. Contents Lecture Basic p electric electric Practic - Volta - Temp - Magr	s: e and seminar ohysical terms cal circuits, ec current field, als: ge source perature-dep netic circuit f teaching:	: s in electrical e quivalent circuit stationary mag	enginee s, calcu gnetic fi ce	ring, tw ulation eld.	ntly derive	our-terr	oply solu	tions to tas	ulation c	
4	them. Contents Lecture Basic p electric electric Practic - Volta - Temp - Magr Forms o Lecture Participa	and seminar ohysical terms cal circuits, ecc current field, als: ge source perature-deponetic circuit f teaching: e, sem. lesson	: s in electrical e quivalent circuit stationary mag endent resistan s with exercise nts: e	enginee s, calcu gnetic fi ce	ring, tw ulation eld.	ntly derive	our-terr	oply solu	tions to tas	ulation c	
4	them. Contents Lecture Basic p electric electric Practic - Volta - Temp - Magr Forms o Lecture Participa Formal: Content:	s: e and seminar ohysical terms cal circuits, ec current field, als: ge source perature-dep netic circuit f teaching: e, sem. lesson tion requireme None f assessment:	: s in electrical e quivalent circuit stationary mag endent resistan s with exercise nts: e	enginee s, calcu gnetic fi ice s and p	ring, tw ulation eld.	vo- and f of DC eld	our-terr ectrical r	ninal ciro	tions to tas	ulation c	
4 5 6	them. Contents Lecture Basic p electric electric Practic - Volta - Temp - Magr Forms of Lecture Participa Formal: Content: Forms of Written Prerequi	and seminar bysical terms cal circuits, ecc current field, als: ge source berature-deponetic circuit f teaching: e, sem. lesson tion requireme None f assessment: or oral exami site for the awa e examination	: s in electrical e quivalent circuit stationary mag endent resistan s with exercise nts: e nation; in each ard of credit point pass with preli	enginee rs, calcu gnetic fi ce s and p <u>case w</u> s: minary e	ring, tw ulation eld. ractica ith prel examir	ntly derive vo- and f of DC ele locourse	our-terr ectrical r	ninal ciro	tions to tas	ulation c	
4 5 6 7	them. Contents Lecture Basic p electric electric Practic - Volta - Temp - Magr Forms o Lecture Participa Formal: Content: Forms o Written Prerequi Module	s: e and seminar ohysical terms cal circuits, ecc current field, als: ge source perature-deponetic circuit f teaching: e, sem. lesson tion requireme None f assessment: or oral exami site for the awa e examination on of the modu able Energies	: s in electrical e quivalent circuit stationary mag endent resistan s with exercise <u>nts:</u> e nation; in each ord of credit point pass with preli ule (in the followin B.Eng.	enginee rs, calcu gnetic fi ce s and p case w s: minary e og study	ring, tw ulation eld. ractica ith prel examir	ntly derive vo- and f of DC ele locourse	our-terr ectrical r	ninal ciro	tions to tas	ulation c	
4 5 6 7 8 9	them. Contents Lecture Basic p electric Practic - Volta - Temp - Magr Forms o Lecture Participa Formal: Content: Forms o Written Prerequi Module Applicati Renewa	and seminar ohysical terms cal circuits, ecc current field, als: ge source perature-deponetic circuit f teaching: e, sem. lesson tion requireme None f assessment: or oral exami site for the awar examination on of the modu able Energies nce of the grade ing to BRPO	: s in electrical e quivalent circuit stationary mag endent resistan s with exercise <u>nts:</u> e nation; in each ard of credit point pass with preli ule (in the followin	enginee rs, calcu gnetic fi ce s and p case w s: minary e og study	ring, tw ulation eld. ractica ith prel examir	ntly derive vo- and f of DC ele locourse	our-terr ectrical r	ninal ciro	tions to tas	ulation c	
4 5 7 8 9 10	them. Contents Lecture Basic p electric electric Practic - Volta - Temp - Magr Forms of Lecture Participa Formal: Content: Forms of Written Prerequi Module Renewa Importar accord	s: e and seminar ohysical terms cal circuits, ec current field, als: ge source perature-dep netic circuit f teaching: e, sem. lesson tion requireme None f assessment: or oral exami site for the awa e examination on of the modu able Energies nce of the grade	: s in electrical e quivalent circuit stationary mag endent resistan s with exercise nts: e nation; in each ard of credit point pass with preli ule (in the followin B.Eng. e for the final gra	enginee rs, calcu gnetic fi ce s and p case w s: minary e og study	ring, tw ulation eld. ractica ith prel examir	ntly derive vo- and f of DC ele locourse	our-terr ectrical r	ninal ciro	tions to tas	ulation c	
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LIEC	ctrical Eng	jineerin	g2							ET2	
	tification ber:	Workl	oad:	Credits:	Stud	y seme:		Frequency offer	of the	Duratio	n:
107	7 150 h		1	5	2nd	sem.		Annual (Summer)		1 semester	
1	Course:			Planned group	sizes	Scop)e	Actual co time / classroor teaching		Self-stuc	ły
	Lecture			60 students		2	weekly hours	30	h	45	h
	Sem. les	sons		30 students		1	weekly hours	15	h	22.5	h
	Exercise			20 students		0	weekly hours	0	h	0	h
	Practical	or semi	nar	15 students		1	weekly hours	15	h	22.5	h
	Supervis	ed self-	study	60 students		0	weekly hours	0	h	0	h
2	Learning	outcom	ies/com	petences:							
		an desig		te tasks for lin ransfer functio			-		•		-
3	Contents									-	
3	Contents - T - A - C - E - S	s: ecture a ime-va Iternati Comple: nergy a ymmet	ryingel ngvolta x altern nd pov rical thr	ectromagneti age and alterr ating current o ver with altern ree-phase sys	nating cu calculat ating cu stems	ion urrent				- 	
3	Contents - Ti - A - C - E - S - P - P - M - M - C - B	ecture a ime-va Iternati Comple: nergy a ymmet ower ar ractica Iodellin Characti alance	rying el ng volta x altern nd pov rical thi nd ener ls: g of rea eristics d/unba	ectromagneti ageand alterr ating current o ver with altern	nating cu calculat lating cu stems netrical l nponen	ion urrent oad ts	<				
3	Contents Lu - T - A - C - E - S - P - N - N - N - C - B Forms of Lecture	ecture a ime-va lternati Comple: nergy a ymmet ower ar ractica lodellin characti alance f teachin a, sem. l	rying el ng volta x altern nd pov rical thi nd ener ls: g of rea eristics d/unba g; essons	ectromagneti age and alterr ating current of ver with altern ree-phase sys gy with symm al passive com of AC circuits lanced three- with exercise	nating cu calculat lating cu stems netrical la nponen s phase r	ion urrent oad ts <u>network</u>					
4	Contents Lu - Ti - A - C - E - S - P P - N - N - C - B Forms of Lecture Participa Formal:	ecture a ime-va Iternati Comple: nergy a ymmet ower ar ractica lodellin Characti alance fteachin e, sem. I	rying el ng volta x altern nd pov rical thin nd ener ls: g of rea eristics d/unba g essons <u>uiremen</u> None	ectromagneti age and alterr ating current of ver with altern ree-phase sys gy with symm al passive com of AC circuits lanced three- with exercise ts:	nating cu calculat ating cu stems netrical l nponen s phase r s and p	ion urrent oad ts network ractica	l course				
4	Contents Lu - T - A - C - C - E - C - P - P - P - P - P - C - B Forms of Lecture Participa Formal: Content: Forms of	ecture a ime-va Iternati Comple: nergy a ymmet ower ar ractica lodellin Characte alance f teachin e, sem. I tion req	rying el ng volta x altern nd pov rical thu nd ener ls: g of rea eristics d/unba g: essons uiremen None Modu nent:	ectromagneti age and alterr ating current of ver with altern ree-phase sys gy with symm al passive com of AC circuits lanced three- with exercise ts:	nating cu calculat ating cu stems netrical l nponen s phase r s and p	ion urrent oad ts networl ractica	l course 074)			mance	
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11	Grundlagen der Elektrotechnik by Gerd Hagemann or Elektrotechnik für Bachelorstudenten by Wolfgang Nerreter
12	Language:
	German

	tric Tracti	on								ETR	
Iden [:] num	tification	Workle	oad:	Credits:	Study	/ semes		Frequen offer	cy of the	Duratio	n:
1078	78 150 h Course:		1	5	4th c	or 6th s	sem.	Annual (Summ	er)	1 sem	ester
1				Planned group	Scop	Scope		Actual contact time / classroom teaching		Self-study	
	Lecture			60 students		2	weekly hours	30	h	45	h
	Sem. less	sons		30 students		1	weekly hours	15	h	22.5	h
	Exercise			20 students		0	weekly hours	0	h	0	h
	Practical	or semi	nar	15 students		1	weekly hours	15	h	22.5	h
	Supervise	ed self-s	study	60 students		0	weekly hours	0	h	0	h
3	- re - ac	ealistica dopt the oply the	ally asse e enorm	stand the des essthe proble nous advanta useful way	ems of st	oringe	electrica	lenergy	-		-
	– Tr	action									
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4	in - Ec - Er - A sc - U - Pr	compa cologic Sl units nergy s Iternati purces (seful tip ractical	arison to al cons s and th torage ve solut (solar ve os for er l applica g:	o vehicles wit umption form le definition c on mobile vel tions with hyb ehicles) nergy-saving	h combu hula for th of enviror hicles (e priddrive gdriving: ransrapio	ustion of he ene hmenta lectroo es, fuel style d, e-ca	drive sys rgy dem ally friend chemica cells, ult ar, e-bike	stems hand of c dly mob l and me racaps a e, e-unic	differentn ility echanical and reger sycle)	neansoftr storage) nerative en	ansport
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11	Other information:
	Literature will be announced at the beginning of the course. Students must have sufficient knowledge and experience in the use and safety of electrical equipment
12	Language:
	German

			Credits:	Study	/ semes	ster	Frequenc	v of the	Durati	on:
numl	ber:						offer			
1323	3	150 h	5	6th s	sem.		Annual (Summe	er)	1 sem	nester
	Course:		ourse: Planned group sizes		Scope		Actual contact time / classroom teaching		Self-study	
	Lecture		60 students		2	weekly hours		h	45	h
	Sem. les	sons	30 students		2	weekly hours	30	h	45	h
	Exercise)	20 students		0	weekly hours	0	h	0	h
	Practical	l or seminar	15 students		0	weekly hours	0	h	0	h
	Supervis	ed self-study	60 students		0	weekly hours	0	h	0	h
	process certific them w unders	les. By mean sing enginee ations for bui vith regard to tand the basi	s of practical e ering tasks. Fu Idings with incre the criteria of s ic idea of mode	exercis irtherm eased e ustaina el-base	es, the ore, t energy ability, ⁻ ed plar	ey learn he stud or ecolo feasibilit	to use lents ha ogical rea y and ec ong the l	ive know quiremer conomic ines of E	n standar wledge c nts and ca efficiency Building Ir	ds for t of varic n evalua n. Stude nformati
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3	process certific them w unders Modell Contents Determ Avoida	les. By mean sing enginee ations for bui ith regard to tand the basi ing (BIM) and s ination of hea Calculation Thermal bric nce of damag Condensatie Mould criter saving energy g Energy Law Calculation, Energy dem Building sup according to Software inte	s of practical e ering tasks. Fu Idings with incre- the criteria of s ic idea of mode can classify the at losses via the of the U-value dges ge to building ele on inside buildin ion y and using ren y – GEG) / requirements a and oply HVAC (heat o DIN V 18599	exercis intherm eased e ustaina el-base influer building ements ig elem ewable accordi ing/coo	es, the ore, the energy ability, ed plan ice on v genve (DIN 4 ents ar e energe ng to C oling/a	ey learn he stud or ecolo feasibilit nning alo work pro lope 108-2, G nd on sur gy for hea GEG/ DIN	to use lents ha ogical red y and ec ong the l cesses i Glaser me rfaces ating and	unknowr we know quiremer onomic ines of E n the con	n standar wledge c its and ca efficiency Building Ir istruction	ds for t of varic in evalua in Stude nformat industr
3	process certific them w unders Modell Contents Determ Avoida Law for (Buildir	les. By mean sing enginee ations for bui ith regard to tand the basi ing (BIM) and s: ination of hea Calculation Thermal bric Nould criter saving energy according to Software inter renewable en	s of practical e ering tasks. Ful Idings with incre- the criteria of s ic idea of mode can classify the at losses via the of the U-value dges ge to building ele on inside buildin ion ly and using ren v – GEG) / requirements a and oply HVAC (heat o DIN V 18599 roduction	exercis intherm eased e ustaina el-base influen building ements ag elem ewable accordi ing/coo	es, the ore, the energy ability, ed plan ice on v genve (DIN 4 ents ar e energe ng to C oling/a	ey learn he stud or ecolo feasibilit nning alo work pro lope 108-2, G nd on sur gy for hea GEG/ DIN	to use lents ha ogical red y and ec ong the l cesses i Glaser me rfaces ating and	unknowr we know quiremer onomic ines of E n the con	n standar wledge c its and ca efficiency Building Ir istruction	ds for t of varic in evalua in Stude nformat industr

	guidelines
	C2C inspired buildings
	Alternative materials
	 Basics BIM (digitalisation, professional fields, innovations)
4	Forms of teaching:
	Lecture, sem. lessons
5	Participation requirements:
	Formal:
	Content:
6	Forms of assessment:
	Term paper, written examination or oral examination
7	Prerequisite for the award of credit points:
	Module examination pass
8	Application of the module (in the following study programmes)
	Renewable Energies B.Eng.
9	Importance of the grade for the final grade:
	according to BRPO
10	Module coordinator:
	Prof. DrIng. Eva Schwenzfeier-Hellkamp
11	Other information:
	Literature will be announced at the beginning of the course.
12	Language:
	German

Buil	ding Auto	mation							GAT	
	tification	Workload:	Credits:	Study	y semes		Frequenc	y of the	Durati	on:
num 109		150 h	5		or 6th ester		^{offer} Annual (Summe	r)	1 sem	nester
1	Course:		Planned group	sizes	Scop	e	actual c time / classroo teaching	om	Self-stu	ıdy
	Lecture		60 students		2	weekly hours	30	h	45	h
	Sem. less	sons	30 students		2	weekly hours	30	h	45	h
	Exercise		20 students		0	weekly hours	0	h	0	h
	Practical	or seminar	15 students		0	weekly hours	0	h	0	h
	Supervis	ed self-study	60 students		0	weekly hours	0	h	0	h
	design	basic automa	els of the comp ations and contr ations of such r	olsusin	ig stan	dardteck	nniquesa	andstanc	larddiag	rams. The
3	design discuss They m applica Contents	basic automa the contribu- ethodically a tion. Definition and Possibilities a Requirement Heating, vent energies), ph Use of senso Control, cont Bus systems, User interfac Accessibility	ations and contr tions of such p ssess which hu d structure of b and limits of ene s for human us tilation, air cond ysical principle rs and actuator roller types, op protocols, netw es, usability , ambient assist topics: Standa	ols usin plants to iman-b uilding a ergy effi e: comf litioning s, chara s; ubiqu timisatio working ed livin	g stand o energ uilding automa iciency ort, pol g: basic acterist uitous/j on of en , comp g, smal	dard teck gy efficie interface ation (through lutants, e devices devices pervasive nergy us puter syst	nniques a ency qua es are ap smart bi etc. (also for s e compu se tems, bui	and stanc alitatively opropriate uildings the use c ting Iding mai	lard diag and qua e for the	rams. The antitative respectiv
3	design discuss They m applica Contents	basic automa the contribu- ethodically a tion. Definition and Possibilities a Requirement Heating, vent energies), ph Use of senso Control, cont Bus systems, User interfac Accessibility Overarching documentati	ations and contr tions of such p ssess which hu d structure of br and limits of ene is for human us tilation, air cond ysical principle rs and actuator roller types, op protocols, network es, usability , ambient assist topics: Standar on	ols usin plants to iman-b uilding a ergy effi e: comf litioning s, chara s; ubiqu timisatio working ed livin	g stand o energ uilding automa iciency ort, pol g: basic acterist uitous/j on of en , comp g, smal	dard teck gy efficie interface ation (through lutants, e devices devices pervasive nergy us puter syst	nniques a ency qua es are ap smart bi etc. (also for s e compu se tems, bui	and stanc alitatively opropriate uildings the use c ting Iding mai	lard diag and qua e for the	rams. The antitative respectiv
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	Engineering Computer Sciences B.Eng and Renewable Energies B.Eng.
9	Importance of the grade for the final grade:
	according to BRPO
10	Module coordinator:
	Prof. Dr. rer. nat. Jörn Loviscach
11	Other information:
	Literature will be announced at the beginning of the course.
12	Language:
	German

Image: Course: Planned group sizes Scope Actual contact time / classroom teaching Lecture 60 students 2 weekly 30 n 45 n Sem. lessons 30 students 2 weekly 30 n 45 n Exercise 20 students 0 weekly 0 n 0 n Practical or seminar 15 students 0 weekly 0 n 0 n Supervised self-study 60 students 0 weekly 0 n 0 n 2 Learning outcomes/competences: The students . . Now the terms, history and differences of gender/gender mainstreaming and diversity/diversity management. .	denti								_			
M35 150 h 5 5th sem. Annual Winter) 1 semester Course: Planned group sizes Scope Actual contact classroom Self-study transcription Lecture 60 students 2 weekly 30 h 45 h Sem. lessons 30 students 2 weekly 0 h 0 h Exercise 20 students 0 weekly 0 h 0 h Supervised self-study 60 students 0 weekly 0 h 0 h Supervised self-study 60 students 0 weekly 0 h 0 h Supervised self-study 60 students 0 weekly 0 h 0 h Its students . know the terms, history and differences of gender/gender mainstreaming and diversity/diversity management. . know the terms, history and differences of gender/gender mainstreaming and diversity/diversity management. . know the terms, history and differences of gender and diversity (e.g. EU Anti- Discrimination Directive, General Equal Treatment Act) . are sensitised to human heterogenetyin the corporate context. .			Workloa	ad:	Credits:	Study	y semes			cy of the	Durati	on:
Image Image Image Image Lecture 60 students 2 weekly 30 h 45 h Sem. lessons 30 students 2 weekly 30 h 45 h Exercise 20 students 0 weekly 0 h 0 h Practical or seminar 15 students 0 weekly 0 h 0 h Supervised self-study 60 students 0 weekly 0 h 0 h 2 Learning outcomes/competences: The students • know the terms, history and differences of gender/gender mainstreaming and diversity/diversity management. • know tegal principles in the context of gender and diversity (e.g. EU Anti-Discrimination Directive, General Equal Treatment Act) • are sensitised to human heterogeneity in the corporate context. • independently recognise stereotyping and can develop ideas for possible changes the business environment. • are able to independently collect relevant information on established concepts suc as gender mainstreaming and diversity management and to assess their relevance professional practice. •			150 h 5		5 5th sem.				Annual		1 semester	
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Practical or seminar 15 students 0 hours 0 h 0 h Supervised self-study 60 students 0 weekly 0 h <t< td=""><td></td><td>Sem. less</td><td>sons</td><td>3</td><td>0 students</td><td></td><td>2</td><td>-</td><td>30</td><td>h</td><td>45</td><td>h</td></t<>		Sem. less	sons	3	0 students		2	-	30	h	45	h
Supervised self-study 60 students 0 weekly hours 0 h 0 h 0 h 2 Learning outcomes/competences: The students. • Know the terms, history and differences of gender/gender mainstreaming and diversity/diversity management. • Know legal principles in the context of gender and diversity (e.g. EU Anti- Discrimination Directive, General Equal Treatment Act) • are sensitised to human heterogeneity in the corporate context. • independently recognise stereotyping and can develop ideas for possible changes the business environment. • are able to independently collect relevant information on established concepts suc as gender mainstreaming and diversity management and to assess their relevance professional practice. • are familiar with selected theories and approaches in the current discourse on diversity management and, building on this, are able to develop conceptual ideas for the implementation of holistic diversity management in a corporate context. 3 Contents: • Definitions and delimitation of gender and diversity • Concepts and approaches to equal opportunities(e.g. diversity management, Anti-Discrimination Directive, General Anti-Discrimination Directive, General Equal Treatment Act (German abbreviation: AGG)) • Legal basis and political influences (e.g. EU Anti-Discrimination Directive, General Anti-Discrimination Directive, General Equal Treatment Act (German abbreviation: AGG)) •		Exercise		2	0 students		0	-	0	h	0	h
Image: Contents: Image: Contents: 2 Learning outcomes/competences: The students • know the terms, history and differences of gender/gender mainstreaming and diversity/diversity/management. • know legal principles in the context of gender and diversity (e.g. EU Anti-Discrimination Directive, General Equal Treatment Act) • are sensitised to human heterogeneity in the corporate context. • independently recognise stereotyping and can develop ideas for possible changes the business environment. • are able to independently collect relevant information on established concepts such as gender mainstreaming and diversity management and to assess their relevance professional practice. • are familiar with selected theories and approaches in the current discourse on diversity management and, building on this, are able to develop conceptual ideas for the implementation of holistic diversity management in a corporate context. 3 Contents: • Definitions and delimitation of gender and diversity • Concepts and approaches to equal opportunities (e.g. diversity management, gend mainstreaming) • Legal basis and political influences (e.g. EU Anti-Discrimination Directive, General Anti-Discrimination Directive, General Equal Treatment Act (German abbreviation: AGG)) • Subjective and social values, attitudes and prejudices in the context of diversity • Possible approaches for taking diversity characteristics (e.g. gender and age) into account in selected areas of business (marketing,		Practical	or semina	ar 19	5 students		0	-	0	h	0	h
The students • know the terms, history and differences of gender/gender mainstreaming and diversity/diversity management. • know legal principles in the context of gender and diversity (e.g. EU Anti-Discrimination Directive, General Equal Treatment Act) • are sensitised to human heterogeneity in the corporate context. • independently recognise stereotyping and can develop ideas for possible changes the business environment. • are able to independently collect relevant information on established concepts such as gender mainstreaming and diversity management and to assess their relevance professional practice. • are familiar with selected theories and approaches in the current discourse on diversity management and, building on this, are able to develop conceptual ideas for the implementation of holistic diversity management in a corporate context. 3 Contents: • Definitions and delimitation of gender and diversity • Definitions and paproaches to equal opportunities (e.g. diversity management, gend mainstreaming) • Legal basis and political influences (e.g. EU Anti-Discrimination Directive, General Equal Treatment Act (German abbreviation: AGG)) • Subjective and social values, attitudes and prejudices in the context of diversity • Possible approaches for taking diversity characteristics (e.g. gender and age) into account in selected areas of business (marketing, product development, human resources)		Supervise	ed self-sti	udy 6	0 students		0		0	h	0	h
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5 Participation requirements:		• • • • • • • •	Definitio Concep mainstre Legal ba Anti-Dis AGG)) Subjecti Possible account resource Concep Case stu teaching:	ts and a eaming) asis and crimina ve and s approa in selec es) t for the udies an	political inf tion Directiv social value aches for tal cted areas c sustainable id applicatio	to equa luences ve, Gene es, attituc king dive of busine e introdu on exam	l oppo (e.g. El eral Equ des and ersity c ess (ma uction c ples fro	tunities(J Anti-Di al Treatr d prejudio haracter rketing, p of holistic	é.g. div iscrimin ment Ac ces in th istics (e. product diversi iess pra	ation Dire tt (German g. gende developr ty manage	ective, Gen n abbrevia t of divers r and age ment, hum ement	neral ation: itty) into
						n, group v	work, p	resentat	ion of se	eminarpa	aper	
Formal:				romonto.								

6	Forms of assessment:
	Term paper, written examination or oral examination
7	Prerequisite for the award of credit points:
	Module examination pass
8	Application of the module (in the following study programmes)
	Applied Mathematics B.Sc., Biotechnology and Instrumentation Engineering B.Sc., Electrical
	Engineering B.Eng., Computer Engineering B.Eng., Mechanical Engineering B.Eng.,
	Mechatronics B.Sc., Renewable Energies B.Eng. and Industrial Engineering and Management
	B.Sc.
9	Importance of the grade for the final grade:
	according to BRPO
10	Module coordinator:
	Prof. DrIng. Andrea Kaimann
11	Other information:
	Literature will be announced at the beginning of the course.
12	Language:
	German

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lden num	tification ber:	Workload:	Credits:	Stud	y seme		Frequency offer	of the	Duratio	n:
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1	Course:		Planned group	sizes	Scop	De	Actual ce time / classroot teaching		Self-stud	dy
	Lecture		60 students		2	weekly hours	30	h	45	h
	Sem. less	sons	30 students		1	weekly hours	15	h	22.5	h
	Exercise		20 students		0	weekly hours	0	h	0	h
		or seminar	15 students		1	weekly hours	15	h	22.5	h
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1107		150 h	5	3rd s	sem.		Annual (Winter)		1 sem	ester
1	Course:		Planned group	sizes	Scop	e	Actual o time / classroo teaching	om	Self-stu	dy
	Lecture		60 students		2	weekly hours	30	h	45	h
	Sem. les	sons	30 students		1	weekly hours	15	h	22.5	h
	Exercise)	20 students		0	weekly hours	0	h	0	h
		l or seminar	15 students		1	weekly hours	15	h	22.5	h
		ed self-study			0	weekly hours	0	h	0	h
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	mather algorith search of num	natical oper nms using ai for errors. T bers and str	ations, for input/o ds such as struct hey take into acc	output c ture dia	on the s grams	creenan or progra	nd for har amme flo	ndling file ow charts	es. They de s. They me	esign sm ethodica
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9	Importance of the grade for the final grade:
	according to BRPO
10	Module coordinator:
	Prof. DrIng. Wolfram Schenck
11	Other information:
	Literature will be announced at the beginning of the course.
12	Language:
	German

Cor	nputer Sc	ience 2								INF2	
lden num	tification	Worklo	ad:	Credits:	Study	y semes		Frequenc offer	y of the	Duratio	on:
1111		150 h		5	4th s	sem.		Annual (Summe	r)	1 sem	ester
1	Course:		F	Planned group	sizes	Scop	e	Actual o time / classroo teaching	om	Self-stud	dy
	Lecture		6	60 students		2	weekly hours	30	h	45	h
	Sem. les	sons	3	80 students		1	weekly hours	15	h	22.5	h
	Exercise	!	2	20 students		0	weekly hours	0	h	0	h
	Practical	or semin	ar 1	5 students		1	weekly hours	15	h	22.5	h
	Supervis	ed self-st	udy (60 students		0	weekly hours	0	h	0	h
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10	Module coordinator:
	Prof. Dr. rer. nat. Jörn Loviscach
11	Other information:
	Literature will be announced at the beginning of the course.
12	Language:
	German

Please note: The German version of this document is the legally binding version. The English translation provided here is for information purposes only.

Inve	estment ar	IC FINANCING							FIN		
lden num	tification	Workload:	Credits:	Study	/ semes		Frequency offer	of the	Duratio	on:	
1118			150 h 5 2r se		d, 4th or 6th n.		Annual (Summer)		1 sem	1 semester	
1	Course:		Planned group	sizes	Scop	e	Actual c time / classroo teaching	m	Self-stud	dy	
	Lecture		60 students		3	weekly hours	45	h	67.5	h	
	Sem. les	sons	30 students		1	weekly hours	15	h	22.5	h	
	Exercise	•	20 students		0	weekly hours	0	h	0	h	
	Practical	l or seminar	15 students		0	weekly hours	0	h	0	h	
	Supervis	ed self-study	60 students		0	weekly hours	0	h	0	h	
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11 Literature will be announced at the beginning of the course.

	Renewable Energies study programme: Elective module
12	Language:
	German

Coll	loquium									KOL	
Iden [:] num	tification ber:	Workload:		Credits:	-	/ semes		Frequency offer		Durati	on:
1290	0	90 h		3	6th c	or 7th s	sem.	each ser	nester		
1	Course:		Pla	anned group s	izes	Scop	e	Actual c time / classroc teaching	m	Self-stu	ıdy
	Lecture		60	students		0	weekly hours	0	h	90	h
	Sem. less	sons	30	students		0	weekly hours	0	h	0	h
	Exercise		20	students		0	weekly hours	0	h	0	h
	Practical	or seminar	15	students		0	weekly hours	0	h	0	h
	Supervise	ed self-study	60	students		0	weekly hours	0	h	0	h
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Pow	er Electro	nics							LE	
Ident numk	ification per:			y seme:		Frequency of the offer		Duratio	Duration:	
1138	138 150 h		5	5th	5th sem.		Annual (Winter)		1 semester	
1	Course:	1	Planned group	sizes	Scop	e	Actual time / classro teachin		Self-stud	dy
	Lecture		60 students		2	weekly hours	30	h	45	h
	Sem. less	sons	30 students		1	weekly hours	15	h	22.5	h
	Exercise		20 students		0	weekly hours	0	h	0	h
		or seminar	15 students		1	weekly hours	15	h	22.5	h
2	-	ed self-study outcomes/con	60 students		0	weekly hours	0	h	0	h
3	 acquintera estat Contents Funccircu 	action of micr blish power b : tional princip its (W1, W3, B	e of electroma to- and power e alances with re le of commutat 2, B6)	electror gard to torless,	hics the ha line-co	rmonics	ed and s			
	 Effici Cont Three Main Mono semi Innov vehic Labc Com Mair Self- 	encies, harm rol, protectio e-phase drive s-friendly po olithic fusion conductor ch vative fields o cles and in de mutatorless mutatorless -guided conv	converter circu power converte	power of powe oquenc with Po onics (e s) power ergy ma	calcula relectr y conve ower Fa energy electro anagen	ations onic con erter (spa actor Cor) and mic onics in a	nponent ace vect ntrol (PF) roelectr	or modul C) ronics (inf	ormation)	
4		teaching: , sem. lesson:	s and practical	training	ginsma	all groups	s (3–4 pa	articipant	s)	
5	Participat Formal: Content:		e ules on Electric		hines(1059)an	d Drive ⁻	Fechnolo	gy (1013) s	hould
		SUCC	essiully compl	eleu						
6		assessment:	essfully compl or oral examina							

8	Electrical Engineering B.Eng, Engineering Computer Sciences B.Eng and Renewable Energies B.Eng.
9	Importance of the grade for the final grade: according to BRPO
10	Module coordinator:
	Prof. DrIng. Jan Boris Loesenbeck
11	Other information:
	Literature will be announced at the beginning of the course.
	Students must have sufficient knowledge and experience in the use and safety of electrical
	equipment.
	Renewable Energies study programme, specialisation in Energy Efficient Systems: Elective
	subject
12	Language:
	German

Mat	hematics	:1							MA1	
lden num	tification	Workload:	Credits:	Stud	y seme		Frequence offer	cy of the	Durati	on:
1150		300 h	10	1st s	em.		Annual (Winter)		1 sem	nester
1	Course:	1	Planned group	sizes	Scop	e	actual time / classro teachir		Self-stu	ıdy
	Lecture		60 students		4	weekly hours		h	90	h
	Sem. les	sons	30 students		4	weekly hours	60	h	90	h
	Exercise)	20 students		0	weekly	0	h	0	h
	Practical	l or seminar	15 students		0	weekly hours	0	h	0	h
	Supervis	ed self-study	60 students		0	weekly hours	0	h	0	h
	valued approx integra	functions an imation and m Is and transfe	and ambiguitie Id estimate the nodel simple gro r the concept o . They model b	eir valu owth or f the int	ie with decay egralt	nout aids problem o applica	s. They nsusing ations su	apply d derivativ ich as de	lerivatives es. They s termining	s to line solve bas the cent
	valued approx integra of grav random limitatio	functions an imation and m Is and transfe ity or volume n variables. T ons of these in	d estimate the nodelsimplegro r the concept o . They model b hey use basic	eir valu owthor ftheint pasicst	ie with decay egralt ochast	nout aids problem o applica	s. They nsusing ations su gs with	apply d derivativ ich as de the help	lerivatives es. They s termining of probat	s to line solve bas the cent pilities ar
3	valued approx integra of grav random limitation Contents	functions an imation and m ls and transfe ity or volume n variables. T ons of these in s: Sets; number Basics of logi Functions (por rational funct triangle) Eule Sequences, I Derivative, de Integral, integ Combinatori	d estimate the nodel simple gro r the concept o . They model b hey use basic to account. systems N to C c; methodical s owers, roots, ex ions, trigonome r's formula; pol- imits of sequen erivation rules, len cs; basics of sto ls of numerics; 1	eir valu owth or f the int pasic st compu- compu- solving ponent etric fur ar repre- nces and inear ap ngth, ar pochastic	e with decay egralt ochast uter alg of equa- ial fund actions esentat d of fur oproxir ea and cs	nout aids problem o applica ic setting gebra an ations an ctions, log including ion of co nctions mation, et volume	s. They nsusing ations su gs with id comp id inequ garithms gcalcul mplex r xtrema	apply d derivativ ich as de the help outer nur alities s, polynor ations on umbers	erivatives es. They s termining of probat nerics and mial functi the gener	s to line solve bas the cent pilities ar d take th ons, ral plane
3	valued approx integra of grav random limitation Contents	functions an imation and m ls and transfe ity or volume n variables. T ons of these in Sets; number Basics of logi Functions (por rational funct triangle) Eule Sequences, I Derivative, de Integral, integ Combinatori Fundamenta of mathemat	d estimate the nodel simple gro r the concept o . They model b hey use basic to account. r systems N to C c; methodical s owers, roots, ex ions, trigonome r's formula; pol- imits of sequen erivation rules, len cs; basics of sto ls of numerics; n ical software	eir valu owth or f the int pasic st compu- compu- solving ponent etric fur ar repre- nces and inear ap ngth, ar pochastic	e with decay egralt ochast uter alg of equa- ial fund actions esentat d of fur oproxir ea and cs	nout aids problem o applica ic setting gebra an ations an ctions, log including ion of co nctions mation, et volume	s. They nsusing ations su gs with id comp id inequ garithms gcalcul mplex r xtrema	apply d derivativ ich as de the help outer nur alities s, polynor ations on umbers	erivatives es. They s termining of probat nerics and mial functi the gener	s to line solve bas the cent pilities ar d take th ons, ral plane
4	valued approx integra of grav random limitation Contents	functions an imation and m ls and transfe ity or volume n variables. T ons of these in s: Sets; number Basics of logi Functions (por rational funct triangle) Eule Sequences, I Derivative, de Integral, integ Combinatori Fundamenta of mathemat f teaching: e, sem. lesson tion requirement	d estimate the nodel simple gra- r the concept of r the concept of they use basic to account. r systems N to C c; methodical so wers, roots, ex ions, trigonome r's formula; pol- imits of sequen erivation rules, len cs; basics of sto ls of numerics; n ical software	eir valu owth or f the int pasic st compu- compu- solving ponent etric fur ar repre- nces and inear ap ngth, ar pochastic	e with decay egralt ochast uter alg of equa- ial fund actions esentat d of fur oproxir ea and cs	nout aids problem o applica ic setting gebra an ations an ctions, log including ion of co nctions mation, et volume	s. They nsusing ations su gs with id comp id inequ garithms gcalcul mplex r xtrema	apply d derivativ ich as de the help outer nur alities s, polynor ations on umbers	erivatives es. They s termining of probat nerics and mial functi the gener	s to line solve bas the cent pilities ar d take th ons, ral plane
4	valued approx integra of grav random limitatio Contents • • • • • • • • • • • • • • • • • • •	functions an imation and m ls and transfe ity or volume n variables. T ons of these in s: Sets; number Basics of logi Functions (por rational funct triangle) Eule Sequences, I Derivative, de Integral, integ Combinatori Fundamenta of mathemat f teaching: e, sem. lesson tion requireme None f assessment: examination	d estimate the nodel simple gro r the concept o . They model b hey use basic to account. r systems N to C c; methodical s owers, roots, ex ions, trigonome r's formula; pol- imits of sequen erivation rules, len cs; basics of sto ls of numerics; n ical software s nts: e	eir valu owth or f the int basic st compu- c solving ponent etric fur ar repre- nces and inear ap ngth, ar pochastic numeric	e with decay egralt ochast uter alg of equa- ial fund actions esentat d of fur oproxir ea and cs	nout aids problem o applica ic setting gebra an ations an ctions, log including ion of co nctions mation, et volume	s. They nsusing ations su gs with id comp id inequ garithms gcalcul mplex r xtrema	apply d derivativ ich as de the help outer nur alities s, polynor ations on umbers	erivatives es. They s termining of probat nerics and mial functi the gener	s to line solve bas the cent pilities ar d take th ons, ral plane
	valued approx integra of grav random limitatio Contents • • • • • • • • • • • • • • • • • • •	functions an imation and m ls and transfe ity or volume n variables. T ons of these in s: Sets; number Basics of logi Functions (por rational funct triangle) Eule Sequences, I Derivative, de Integral, integ Combinatori Fundamenta of mathemat f teaching: e, sem. lesson tion requireme None f assessment: examination site for the awa	d estimate the nodel simple gro r the concept o . They model b hey use basic to account. systems N to C c; methodical s owers, roots, ex ions, trigonome r's formula; pol- imits of sequen erivation rules, ler cs; basics of sto ls of numerics; r ical software s nts: e or oral examina rd of credit point	eir valu owth or f the int basic st compu- c solving ponent etric fur ar repre- nces and inear ap ngth, ar pochastic numeric	e with decay egralt ochast uter alg of equa- ial fund actions esentat d of fur oproxir ea and cs cal met	ations an etions, log including ion of co nation, et hods of t	s. They nsusing ations su gs with id comp id inequ garithms gcalcul mplex r xtrema	apply d derivativ ich as de the help outer nur alities s, polynor ations on umbers	erivatives es. They s termining of probat nerics and mial functi the gener	s to line solve bas the cent pilities ar d take th ons, ral plane

	according to BRPO
10	Module coordinator:
	Prof. Dr. rer. nat. Jörn Loviscach
11	Other information:
	Literature will be announced at the beginning of the course.
12	Language:
	German

Mat	hematics	\$2							MA2		
lden num	tification	Workload:	Credits:	Stud	y seme		Frequence offer	cy of the	Durati	on:	
1156			300 h 10 2nc		sem.		Annual (Summer)		1 sem	1 semester	
1	Course:	1	Planned group	sizes	Scor	De	actual time / classro teachir		Self-stu	ıdy	
	Lecture		60 students		4	weekly hours		h	90	h	
	Sem. les	sons	30 students		4	weekly	60	h	90	h	
	Exercise	9	20 students		0	weekly	0	h	0	h	
	Practica	l or seminar	15 students		0	weekly	0	h	0	h	
	Supervis	sed self-study	60 students		0	weekly hours	0	h	0	h	
	use po approx They s graphic	ower series kimations. The olve difference cal methods	to approximate ney apply Fourie ntial equations s, they obtain an e	e function r series with the poverview	ons, no to the help wof the	oting the analysis of the L e behavio	limitati and syn aplace our of a	ons of th hthesis o transforr function	f periodic n. With th of several	y of the function ne help variable	
	use po approx They s graphic They d above take the	ower series kimations. The olve difference cal methods letermine vo tasks, they e limitations	to approximate ney apply Fourie ntial equations	function r series with the poverview ar quar of comp	ons, no to the help wof the ntities t	oting the analysis of the L e behavio hrough r	limitati and syn aplace our of a multidim	ons of th hthesis o transforr function lensional	ne validity f periodic m. With th of several integratic	y of the functione help variable on. For t	
3	use po approx They s graphic They d above	ower series simations. The olve difference cal methods letermine vol- tasks, they e limitations s: Vectors, so Matrices Determina Eigenvalue Linear syst Fundament linear diffe equations Power serie Fourier serie Laplace tra	to approximate ney apply Fourie ntial equations s, they obtain an o plumes and simi apply functions of these into acco alar product, vec nts s and eigenvect ems of equations tals of setting up rential equations	e function r series with the overview ar quar of comp count. count. ctor produces and sole with color ms by Ta ular for se	ons, no to the help wof the ntities to outer r duct, li asic sol ving or nstant aylor se solving dient, e	ting the analysis of the L behavio hrough r numerics numerics numerics numerics numerics numerics numerics	ilimitati and syn aplace our of a multidim and co and co ations, p ethods th ifferentia ents as w	ons of the hthesis of transform function ensional mputer a lane equation al equation ell as sep al equation	ne validity f periodic m. With th of several integratic lgebra sy uations	y of the functione help variable on. For t stems a	
	use por approx They s graphid They d above t take the Contents	ower series cimations. The olve difference cal methods letermine vol- tasks, they e limitations s: Vectors, soce Matrices Determina Eigenvalue Linear syste Fundament linear diffe equations Power serie Fourier serie Fourier serie Laplace tra Functions of Basic number f teaching:	to approximate ney apply Fourie ntial equations s, they obtain an o plumes and simi apply functions of these into acco alar product, veo nts s and eigenvect ems of equations tals of setting up rential equations es; approximatio es of several variabl erical methods in	e function r series with the overview ar quar of comp count. count. ctor produces and sole with color ms by Ta ular for se	ons, no to the help wof the ntities to outer r duct, li asic sol ving or nstant aylor se solving dient, e	ting the analysis of the L behavio hrough r numerics numerics numerics numerics numerics numerics numerics	ilimitati and syn aplace our of a multidim and co and co ations, p ethods th ifferentia ents as w	ons of the hthesis of transform function ensional mputer a lane equation al equation ell as sep al equation	ne validity f periodic m. With th of several integratic lgebra sy uations	y of the functione help variable on. For t stems a	
3	use por approx They s graphid They d above t take the Contents	ower series simations. The olve difference cal methods letermine vol- tasks, they e limitations s: Vectors, soc Matrices Determina Eigenvalues Linear syst Fundamen linear diffe equations Power series Fourier series Laplace tra Functions of Basic nume	to approximate ney apply Fourie ntial equations s, they obtain an o plumes and simi apply functions of these into acco alar product, veo nts s and eigenvect ems of equations tals of setting up rential equations es; approximatio es onsform, in partic of several variable erical methods in	e function r series with the overview ar quar of comp count. count. ctor produces and sole with color ms by Ta ular for se	ons, no to the help wof the ntities to outer r duct, li asic sol ving or nstant aylor se solving dient, e	ting the analysis of the L behavio hrough r numerics numerics numerics numerics numerics numerics numerics	ilimitati and syn aplace our of a multidim and co and co ations, p ethods th ifferentia ents as w	ons of the hthesis of transform function ensional mputer a lane equation al equation ell as sep al equation	ne validity f periodic m. With th of several integratic lgebra sy uations	y of the function wariable on. For the stems and ticular fferentia	
4	use por approx They s graphid They d above t take the Contents	ower series cimations. The olve difference cal methods letermine vol- tasks, they e limitations s: Vectors, soce Matrices Determina Eigenvalue Linear syste Fundament linear diffe equations Power serie Fourier serie Fourier serie Courier serie Basic number f teaching: e, sem. lesso	to approximate ney apply Fourie ntial equations s, they obtain an o plumes and simi apply functions of these into acco alar product, veo nts s and eigenvect ems of equations tals of setting up rential equations es; approximatio es insform, in partic of several variabl erical methods in	e function r series with the overview ar quar of comp count. count. ctor produces and sole with color ms by Ta ular for se	ons, no to the help wof the ntities to outer r duct, li asic sol ving or nstant aylor se solving dient, e	ting the analysis of the L behavio hrough r numerics numerics numerics numerics numerics numerics numerics	ilimitati and syn aplace our of a multidim and co and co ations, p ethods th ifferentia ents as w	ons of the hthesis of transform function ensional mputer a lane equation al equation ell as sep al equation	ne validity f periodic m. With th of several integratic lgebra sy uations	y of the functione help variable on. For t stems a	

6	Forms of assessment:
	Written examination or oral examination
7	Prerequisite for the award of credit points:
	Module examination pass
8	Application of the module (in the following study programmes)
	Renewable Energies B.Eng.
9	Importance of the grade for the final grade:
	according to BRPO
10	Module coordinator:
	Prof. Dr. rer. nat. Jörn Loviscach
11	Other information:
	Literature will be announced at the beginning of the course.
12	Language:
	German

Met	rology									MT	
lden num	tification ber:	Workload	l:	Credits:	Study	y semes		Frequen offer	icy of the	Duratio	on:
1169		150 h		5	3rd o	or 5th s	sem.	Annual (Winter		1 sem	ester
1	Course:		PI	lanned group	sizes	Scop	e	Actual time / classro teachi		Self-stu	dy
	Lecture		6	0 students		2	weekly hours	30	h	45	h
	Sem. les	sons	3	0 students		1	weekly hours	15	h	22.5	h
	Exercise	•	20	0 students		0	weekly hours	0	h	0	h
	Practical	l or seminar	15	5 students		1	weekly hours	15	h	22.5	h
		ed self-stuc		0 students		0	weekly hours	0	h	0	h
	 They know how digital and electromechanical mea handle measuring instruments. After completing the suitable for a measurement task, design a measu present the measurement results in a suitable mann Contents: Basics, basic circuits Digital and electromechanical measuring instrum Error calculation and causes of measurement det Measurement of electrical quantities 								will be ab		
3	suitable present Contents Basic Basic Digita Error Meas Static Forms of	e for a me t the meas s: cs, basic ci al and elec calculatio surement c onary and f teaching:	asurer ureme rcuits ctrome n and o of elect dynam	ment task, c entresults in echanical me causes of m trical quanti nic behavior	lesign a a suitak easuring neasurei ties ur of me	a meas ble mar jinstrui ment d	urement nner and ments eviations	t circuit perforr	will be ab , perform	the meas	
4	suitable present Contents Basic Digita Error Meas Static Forms of Lecture	e for a me t the meas s: cs, basic ci al and elec calculatio surement c onary and f teaching: e, sem. less	rcuits ctrome n and of dynam	ment task, c entresults in echanical me causes of m trical quanti	lesign a a suitak easuring neasurei ties ur of me	a meas ble mar jinstrui ment d	urement nner and ments eviations	t circuit perforr	will be ab , perform	the meas	
	suitable present Contents Basic Digita Error Meas Static Forms of Lecture Participa Formal:	e for a me t the meas s: cs, basic ci al and elec calculatio surement c onary and f teaching: e, sem. less tion require N 10	asurer ureme rcuits ctrome n and o of elect dynam sons ar ments: one lodule	ment task, c entresults in echanical me causes of m trical quanti nic behavior nd practica	lesign a a suitak easuring leasurei ties <u>ur of me</u> course	a meas plemar y instrui ment d asuring	urement nner and ments eviations	t circuit perforr	will be ab , perform	the meas	
4	suitable present Contents Basic Basic Digita Error Meas Static Forms of Lecture Participa Formal:	e for a me t the meas s: cs, basic ci al and elec calculatio surement c onary and f teaching: e, sem. less tion require N 10	asurer ureme rcuits trome n and o of elect dynam ements: one lodule 075 Ele	ment task, c entresults in chanical me causes of m trical quanti nic behavior nd practica	lesign a a suitak easuring leasurei ties <u>ur of me</u> course	a meas plemar y instrui ment d asuring	urement nner and ments eviations	t circuit perforr	will be ab , perform	the meas	
4 5 6	suitable present Contents Basic Digita Error Meas Static Forms of Lecture Participa Formal:	e for a me t the meas s: cs, basic ci al and elec calculatio surement c onary and f teaching: e, sem. less tion require a, sem. less tion require f assessment examinati	asurer ureme rcuits trome n and o of elect dynam sons ar ments: one lodule 075 Ele	ment task, c entresults in chanical me causes of m trical quanti nic behavior nd practica	lesign a a suitak easuring neasuren ties ur of me course inæring	a meas ple mar uinstrui ment d asuring	urement ments eviations	t circuit perforr	will be ab , perform	the meas	
4 5 6	Suitable present Contents Basic Digita Error Meas Static Forms of Lecture Participa Formal: Content: Forms of Written Prerequi Module	e for a me t the meas s: cs, basic ci al and elec calculatio surement c onary and f teaching: e, sem. less tion require N f assessment examinati site for the a	asurer ureme rcuits ctrome n and o of elect dynam cons ar ments: one lodule 075 Elect on; ea award o ion pa	ment task, c entresults in chanical me causes of m trical quanti nic behavior nd practica es: ectrical Eng ch with preli	easuring easuring easuren ties <u>ur of me</u> course ineering iminary e	a meas ple mar y instrui ment d asuring g 2 examin	urement ments eviations gsystem	t circuit perforr	will be ab , perform	the meas	
4 5 6 7	Suitable present Contents Basic Digita Error Meas Static Forms of Lecture Participa Formal: Content: Forms of Written Prerequi Module	e for a me t the meas s: cs, basic ci al and elec calculatio surement conary and f teaching: e, sem. less tion require N 10 f assessmen examinati site for the a examinati on of the m	asurer ureme rcuits ctrome n and o of elect dynam cons ar ments: one lodule 075 Elect on; ea award o ion pa iodule (ment task, c entresults in chanical me causes of m trical quanti nic behavior nd practica es: ectrical Eng ch with prel of credit poin	easuring easuring easuren ties <u>ur of me</u> course ineering iminary e minary e	a meas ple mar y instrui ment d asuring g2 examin program	urement nner and ments eviations gsystem hation nation	t circuit perforr	will be ab	the measure analysis.	
4	Suitable present Contents Basic Digita Error Meas Static Forms of Lecture Participa Formal: Content: Forms of Written Prerequi Module Applicati Electric B.Eng. Importar	e for a me the meas s: cs, basic ci al and elec calculatio surement c onary and f teaching: e, sem. less tion require no f assessmen examinati site for the a e examinati on of the m cal Enginee	asurer ureme rcuits ctrome n and o of elect dynam sons ar ments: ons ar ments ons ar ments ons ar ments	ment task, c entresults in chanical me causes of m trical quanti nic behavior nd practica es: ectrical Eng ch with prel of credit poin ss with preli (in the followir	easuring easuring easuren ties ur of me course ineering iminary e iminary e ing study eering C	a meas ple mar y instrui ment d asuring g2 examin program	urement nner and ments eviations gsystem hation nation	t circuit perforr	will be ab	the measure analysis.	
4 5 6 7 8	Suitable present Contents Basic Digita Error Meas Static Forms of Lecture Participa Formal: Content: Forms of Written Prerequi Module Applicati Electric B.Eng. Importar accord	e for a me t the meas s: cs, basic ci al and elec calculatio surement c onary and f teaching: e, sem. less tion require ne stion require f assessment e examinati site for the a e examinati on of the m cal Enginee	asurer ureme rcuits ctrome n and o of elect dynam cons ar ments: one lodule 075 Elect on; ea award o ion pa odule (ering B	ment task, o entresults in echanical me causes of m trical quanti nic behavior nd practica nd practica es: ectrical Eng ch with preli fin the followir .Eng, Engin r the final gra	easuring easuring easurenties <u>ur of me</u> course ineering iminary e ing study eering C de:	a meas ple mar y instrui ment d asuring g2 examin program	urement nner and ments eviations gsystem hation nation	t circuit perforr	will be ab	the measure analysis.	
4 5 6 7 8 9	suitable present Contents Basic Digita Error Meas Static Forms of Lecture Participa Formal: Content: Forms of Vritten Prerequi Module Applicati Electric B.Eng. Importar accord Module Prof. Dr	e for a me t the meas s: cs, basic ci al and elect calculatio surement conary and f teaching: e, sem. less tion require to require t assessmen examination site for the a e examination coordinator: crer. nat. T formation:	asurer ureme rcuits ctrome n and o of elect dynam sons ar ments: one lodule 075 Ele tt: on; ea award o ion pa odule (ering B rade fo O	ment task, c entresults in chanical me causes of m trical quanti nic behaviou nd practica es: ectrical Eng ch with preli of credit poin ss with preli (in the followir .Eng, Engin	easuring easuring easuren ties ur of me course ineering minary e iminary e ering C de:	a meas ple mar y instrui ment d asuring g 2 examin program Compu	urement nner and ments eviations gsystem hation hation ter Scier	t circuit perforr	will be ab	the measure analysis.	

Please note: The German version of this document is the legally binding version. The English translation provided here is for information purposes only.

	dern Energ	yy Policy							MEP	
Iden num	tification ber:	Workload:	Credits:	Study	y seme		Frequence offer	cy of the	Durati	on:
1176		150 h	5	6th s	sem.		Annual (Summe	er)	1 sem	lester
1	Course:		Planned group	o sizes	Scop	e	Actual time / classro teachin		Self-stu	ldy
	Lecture		60 students		2	weekly hours	30	h	45	h
	Sem. less	sons	30 students		2	weekly hours	30	h	45	h
	Exercise		20 students		0	weekly hours	0	h	0	h
		or seminar	15 students		0	weekly hours	0	h	0	h
		ed self-study outcomes/cor	60 students		0	weekly hours	0	h	0	h
	policy a technic	nd to discuss al projects. A	he module, stud s them in the gr As well as politi fully.	roup, to	develo	op a strat	tegy cor	ncept and	d to public	cly preser
	- E-mol - Wind - Solar - Bioma - Water Legal fra - EU fra	information successfully. Contents: Treatment of technical energy project - E-mobility - Wind energy projects - Solar energy use - Biomass and agriculture - Water and wastewater management Legal framework of energy policy, e - EU framework on energy efficience								
	 National and EU law on the energy indu Energy industry structures and trade flo Forms of teaching: 									
4	- Energ Forms of	mework on e nal and EU la y industry str	nergy efficient w on the energ ructures and tra	cy y indust						
4	- Energ Forms of Lecture Participat Formal:	mework on e nal and EU la y industry str teaching: and seminar ion requireme None	nergy efficience w on the energe auctures and tra- nts:	cy y indust						
	- Energ Forms of Lecture Participat Formal: Content: Forms of	mework on e nal and EU la y industry str teaching: and seminar ion requireme None assessment:	nergy efficience w on the energ uctures and tra- nts: e e	cy y indust						
5	- Energ Forms of Lecture Participat Formal: Content: Forms of Term pa Prerequis Module	mework on e nal and EU la y industry str teaching: and seminar ion requireme None assessment: aper or oral ex site for the awa examination	nergy efficience w on the energe cuctures and tra- nts: e e camination rd of credit poin pass	cy y indust ade flow ts:	<u>s</u>					
5 6 7 8	- Energ Forms of Lecture Participat Formal: Content: Forms of Term pa Prerequis Module Applicatio Renewa	mework on e nal and EU lar y industry str teaching: and seminar ion requireme None assessment: aper or oral ex- site for the awa examination on of the modu able Energies	nergy efficience w on the energ uctures and tra- nts: e e e e camination pass ule (in the followir B.Eng.	cy y indust ade flow ts:	<u>s</u>	nmes)				
5 6 7 8 9	 Energ Forms of Lecture Participat Formal: Content: Forms of Term pa Prerequis Module Application Renewa Importan accordi 	mework on e nal and EU lay y industry str teaching: and seminar ion requireme None assessment: aper or oral ex- site for the awa examination on of the modu able Entergies ce of the grade	nergy efficience w on the energ uctures and tra- nts: e e e camination ard of credit poin pass ule (in the followir	cy y indust ade flow ts:	<u>s</u>	mmes)				
5 6 7 8 9 10	 Energ Forms of Lecture Participat Formal: Content: Forms of Term patheter Prerequise Module Application Renewat Important according Module of Prof. Dr. 	mework on e nal and EU lar y industry str teaching: and seminar ion requireme None assessment: aper or oral ex- site for the awa examination on of the modu able Energies ce of the grade ng to BRPO coordinator: -Ing. Jan Bor	nergy efficience w on the energ uctures and tra- nts: e e e e camination pass ule (in the followir B.Eng.	cy y indust ade flow ts: ng study ade:	<u>s</u>	mmes)				
5 6 7 8 9	- Energ Forms of Lecture Participat Formal: Content: Forms of Term pa Prerequis Module Applicatio Renewa Importan accordi Module of Prof. Dr. Other infe	mework on e hal and EU lay y industry str teaching: and seminar ion requireme None assessment: aper or oral ex- site for the awa examination on of the modu able Energies ce of the grade ng to BRPO coordinator: -Ing. Jan Bor ormation: re will be ann ation qualifie	nergy efficience w on the energ uctures and tra- nts: e e camination ard of credit poin pass ale (in the followir B.Eng. e for the final gra	cy y indust ade flow ts: ng study ade: c	program	ne course	e. Regul	ar semina		

	sonnel an	d Organisatio	on						PUO	
	itification Iber:	Workload:	Credits:	Stud	y semes		Frequency offer	of the	Duratio	n:
119:	2	150 h	5	4th o	or 6th s	-	Annual (Summer	<i>.</i>)	1 sem	ester
1	Course:		Planned group	sizes	Scop	he	Actual c time / classroo teaching	m	Self-stud	dy
	Lecture		60 students	60 students		weekly hours	45	h	67.5	h
	Sem. les	sons	30 students		1	weekly hours	15	h	22.5	h
	Exercise	9	20 students		0	weekly hours	0	h	0	h
	Practica	l or seminar	15 students		0	weekly hours	0	h	0	h
	Supervis	sed self-study	60 students		0	weekly hours	0	h	0	h
	probler solution	ms that can ns.	th essential theo occur during the ne importance	oretical ne com	conce munic	pts on co ation pro	ocess and	ation; th d have p	ey unders practised	possib
	probler solution They u conditi They ca using p They a signific They ha have do skills.	ms that can ns. Inderstand th ons for succe an explain th oractical exar are familiar v cance for entr ave basic kno emonstrated	occur during th	oretical ne com of learn organis use org topics vity. ne char	conce munic ning fc ational janisati of org acteris	pts on co ation pro or chang theory a ional form anisation tics and s	ommunic ocess and le proces and have ns with re nal chan significan	ce of key	ey unders bractised d can des d their sign their appli can asse y qualificat	possibl sign th nificanc cability ess the tions an
3	problem solution They u conditi They ca using p They a signific They ha signific They ha skills. Contents Signific Fundar Fundar Fundar Environ Organis Organis	ms that can ns. Inderstand the ons for success an explain the practical exart are familiar we cance for entre ave basic known emonstrated set on strated setional strue sational chart	occur during the importance of essful learning. The principles of comples. They can vith important to epreneurial action whedge about the this with example and tasks of hum pour law pommunication arning Theory litions, learning complete and process of the proce	oretical ne com of learn organis use org topics vity. ne chara oles, e.g	conce munic ning fo ational anisati of org acteris pregan ources strateg rganis	pts on co ation pro or chang theory a ional form anisation tics and s rding the manage	ommunic ocess and le proces ind have ns with re- nal chang significan conflict i ment	arning	ey unders practised d can des d their sign their applic can asse y qualificat n and mot	possib sign th nificanc cability ess the tions ar tivation
	probler solution They u conditi They ca using p They a signific They ha have de skills. Contents Signific Fundar Fundar Fundar Environ Organi Organi Person Forms o	ms that can ns. Inderstand the ons for success an explain the practical exart are familiar we cance for entre ave basic known emonstrated second for entre ave basic known emonstrated second for entre and for entre cance, goals a mentals of late mentals of Le mentals of Le mental cond fisational strue sation feaching:	occur during the importance of essful learning. The principles of comples. They can with important the preneurial action with example about the this with example and tasks of hum pour law pommunication arning Theory itions, learning conture and process.	oretical ne com of learn organis use org topics vity. ne char oles, e.g nan reso control, cess o	conce munic. ning fc ational anisati of org acteris acteris pregar burces strateg rganis	pts on co ation pro or chang theory a ional form anisation tics and s roling the manage gies for lif ation, fo	ommunic ocess and le proces ind have ns with re- nal chang significan conflict i ment	arning	ey unders practised d can des d their sign their applic can asse y qualificat n and mot	possib sign th nificanc cability ess the tions ar tivation
4	probler solution They u conditi They ca using p They a signific They ha have de skills. Contents Signific Fundar Fundar Fundar Environ Organi organis Organi Person Forms o	ms that can ns. Inderstand the ons for success an explain the practical exart are familiar we cance for entre ave basic known emonstrated second for entre ave basic known emonstrated second for entre and for entre cance, goals a mentals of late mentals of Le mentals of Le mental cond fisational strue sation feaching:	occur during the importance of essful learning. The principles of conples. They can with important the preneurial action will be about the this with example and tasks of hum pour law pommunication arning Theory litions, learning conture and proceed of the proce	oretical ne com of learn organis use org topics vity. ne char oles, e.g nan reso control, cess o	conce munic. ning fc ational anisati of org acteris acteris pregar burces strateg rganis	pts on co ation pro or chang theory a ional form anisation tics and s roling the manage gies for lif ation, fo	ommunic ocess and le proces ind have ns with re- nal chang significan conflict i ment	arning	ey unders practised d can des d their sign their applic can asse y qualificat n and mot	possib sign th nificanc cability ess the tions ar tivation
3 4 5	probler solution They u conditi They ca using p They a signific They ha have de skills. Contents Signific Fundar Fundar Fundar Environ Organi organis Organi Person Forms o	ms that can ns. Inderstand the ons for success an explain the practical exart are familiar we cance for entre ave basic known emonstrated second for entre a	occur during the importance of essful learning. The principles of comples. They can with important the epreneurial action with example about the this with example and tasks of hum pour law pommunication arning Theory litions, learning conture and proceed on the epreneurial action arning theory litions, learning contains and tasks of hum pour law pommunication arning theory litions, learning contains with exercises ents:	oretical ne com of learn organis use org topics vity. ne char oles, e.g nan reso control, cess o	conce munic. ning fc ational anisati of org acteris acteris pregar burces strateg rganis	pts on co ation pro or chang theory a ional form anisation tics and s roling the manage gies for lif ation, fo	ommunic ocess and le proces ind have ns with re- nal chang significan conflict i ment	arning	ey unders practised d can des d their sign their applic can asse y qualificat n and mot	possib sign th nificanc cability ess the tions ar tivation

	Written examination, combination examination, performance examination or oral examination
7	Prerequisite for the award of credit points:
	Module examination pass
8	Application of the module (in the following study programmes)
	Engineering Computer Sciences B.Eng, Renewable Energies B.Eng. and Industrial Engineering
	and Management B.Sc.
9	Importance of the grade for the final grade:
	according to BRPO
10	Module coordinator:
	Prof. Dr. rer. oec. Thomas Süße
11	Other information:
	Literature will be announced at the beginning of the course. Renewable Energies study
	programme: Possible elective subject
12	Language:
	German

Pho	tovoltaics	i							PHV	
lden num	tification ber:	Workload:	Credits:	Stud	y seme		Frequenc offer	y of the	Duratio	n:
1193		150 h	5	6th s	sem.		Annual (Summe	er)	1 sem	ester
1	Course:	I	Planned group	sizes	Scop	De	Actual time / classroo teachin	om	Self-stud	dy
	Lecture		60 students		2	weekly hours	30	h	45	h
	Sem. less	sons	30 students		1	weekly hours	15	h	22.5	h
	Exercise		20 students		0	weekly hours	0	h	0	h
	Practical	or seminar	15 students		1	weekly hours	15	h	22.5	h
	Supervise	ed self-study	60 students		0	weekly hours	0	h	0	h
	measur	ement results	s of the PV syste					•	e the res g. The stud	
3	categor Contents - Struct - Manu - Comp	rise the result : :ure and func facturing pro ponents of ph	s of the PV syste s in the context tion of solar cell cess of solar ce otovoltaic syste	ems on of rese s lls and	the roo earch a	of of the nd deve	universit	y buildin		
3	categor Contents - Struct - Manu - Comp - Inverte - Safety	rise the result : :ure and func facturing pro ponents of ph er technology y of photovolt	s of the PV syste s in the context tion of solar cell cess of solar ce otovoltaic syste aic systems	ems on of rese Is Ils and ems	the roo earch a	of of the nd deve	universit	y buildin		
3	categor Contents - Struct - Manu - Comp - Inverte - Safety - State Forms of	rise the result cure and func facturing pro ponents of ph er technology of photovolt of research a teaching:	s of the PV syste s in the context tion of solar cell cess of solar ce otovoltaic syste / aic systems nd developmer	ems on of rese s lls and ems nt	the roo earch a solar r	of of the nd deve	universit	y buildin		
	categor Contents - Struct - Manu - Comp - Inverte - Safety - State Forms of Lecture	rise the result cure and func facturing pro ponents of ph er technology of photovolt of research a teaching:	s of the PV syste s in the context tion of solar cell cess of solar ce otovoltaic syste aic systems nd developments s with exercises nts:	ems on of rese s lls and ems nt	the roo earch a solar r	of of the nd deve	universit	y buildin		
4	categor Contents - Struct - Manu - Comp - Inverte - Safety - State Forms of Lecture Participat Formal: Content: Forms of	rise the result ure and funct facturing pro- ponents of ph er technology of photovolt of research a teaching: , sem. lesson tion requirement None assessment:	s of the PV syste s in the context tion of solar cell cess of solar ce otovoltaic syste aic systems nd developments s with exercises nts:	ems on of rese is IIs and ems <u>ht</u>	the roo earch a solar r ractica	of of the nd deve nodules	universit lopment	y buildin	g. The stud	
4 5 6	categor Contents - Struct - Manu - Comp - Inverte - Safety - State Forms of Lecture Participat Formal: Content: Forms of Written	rise the result ure and funct facturing pro- ponents of ph er technology of photovolt of research a teaching: , sem. lessons tion requireme None assessment: or oral exami site for the awa	s of the PV syste s in the context tion of solar cell cess of solar ce otovoltaic syste aic systems nd developments s with exercises nts:	ems on of rese ls IIs and ems nt s and p case w s:	the roo earch a solar r ractica	of of the nd deve nodules	universit lopment	y buildin	g. The stud	
4 5 6 7	categor Contents - Struct - Manu - Comp - Inverte - Safety - State Forms of Lecture Participat Formal: Content: Forms of Written Prerequis Module	rise the result : : : : : : : : : : : : :	s of the PV syste s in the context tion of solar cell cess of solar cell cess of solar ce otovoltaic syste aic systems nd developments swith exercises nts: e nation; in each pass and cours le (in the following	ems on of rese ls Ils and ems nt s and p case w s: se asse	the roo earch a solar r ractica ith pre	of of the nd deve nodules al course	universit lopment	y buildin	g. The stud	
4 5 7 8	categor Contents - Struct - Manu - Comp - Inverte - Safety - State Forms of Lecture Participat Formal: Content: Forms of Written Prerequis Module Applicatio Renewa	rise the result ure and funct facturing pro- ponents of ph- er technology of photovolt of research a teaching: , sem. lesson tion requireme None assessment: or oral exami- site for the awa examination on of the modu- able Energies	s of the PV syste s in the context tion of solar cell cess of solar cell cess of solar ce otovoltaic syste aic systems nd developments swith exercises nts: e nation; in each pass and cours le (in the following	ems on of rese ls Ils and ems ant s and p case w s s e asse g study	the roo earch a solar r ractica ith pre	of of the nd deve nodules al course	universit lopment	y buildin	g. The stud	
4	categor Contents - Struct - Manu - Comp - Inverte - Safety - State Forms of Lecture Participat Formal: Content: Formal Content: Forms of Written Prerequis Module Applicatio Renewa Importan accordi	rise the result: ure and funct facturing pro- ponents of ph er technology of photovolt of research a teaching: , sem. lesson: tion requireme None assessment: or oral exami- site for the awa examination on of the modu able Energies ce of the grade ng to BRPO coordinator:	s of the PV syste s in the context tion of solar cell cess of solar cell cess of solar ce otovoltaic syste aic systems nd developments swith exercises mation; in each rd of credit points pass and cours le (in the following B.Eng.	ems on of rese ls and ems nt s and p case w s se asse g study de:	the roo earch a solar r ractica ith pre	of of the nd deve nodules al course	universit lopment	y buildin	g. The stud	
4 5 7 8 9	categor Contents - Struct - Manu - Comp - Inverte - Safety - State Forms of Lecture Participat Formal: Content: Forms of Written Prerequis Module Renewa Importan accordi Module of	rise the result: ure and funct facturing pro- ponents of pho- er technology of photovolt of research a teaching: , sem. lesson tion requireme None assessment: or oral exami- site for the awa examination on of the modu able Energies ce of the grade ng to BRPO coordinator: -Ing. Eva Sch ormation:	s of the PV syste s in the context tion of solar cell cess of solar cell cess of solar ce otovoltaic syste aic systems nd development s with exercises nts: e nation; in each of rd of credit points pass and cours le (in the following B.Eng. e for the final grad	ems on of rese ls Ils and ems nt s and p case w s se asse g study de: kamp	the roo earch a solar r ractica ith pre ssmen progra	of of the nd deve nodules al course liminary e tt mmes)	universit lopment	y buildin	g. The stud	

	sics 1								PH1	
Ident numl	tification	Workload:	Credits:	Study	y semes		Frequency offer	/ of the	Duratio	n:
1198		150 h	5	1st s	em.		Annual (Winter)		1 seme	ester
1	Course:	I	Planned group	sizes	Scop	e	Actual c time / classroo teaching	m	Self-stuc	уły
	Lecture		60 students		2	weekly hours	30	h	45	h
	Sem. less	sons	30 students		1	weekly hours	15	h	22.5	h
	Exercise		20 students		0	weekly hours	0	h	0	h
	Practical	or seminar	15 students		1	weekly hours	15	h	22.5	h
	Supervise	ed self-study	60 students		0	weekly hours	0	h	0	h
3	student technic The stu- experim measur	s have initia al problems dents have nental repor ement data cal expecta es.	les of the mech l experience in re independently. acquired initial ts. They know the a. The students ations and have	ecognis skills in e metho can co	simple simple dsofe mpare	blem co e experir rror analy e their p	ntexts an nentatior ysis and o ractical	id in the n n and in th can apply measurer	nethods o ne prepai them to t ment resu	f solvin ration o heir ow ults wit
	 Basic Kinem Newto momen 	cal quantitie concepts c natics: Tran onian mech tum	es: Notations, rule f mechanics slation and rotati anics: Mass, forc	on	-		tofinerti	a,torque,	angular	f simpl
	 Basic Kinem Newto Momen Worka Conse Shock Mech Basic 	cal quantitie concepts c natics: Tran onian mech tum and energy ervation law claws anics of liqu concepts o	f mechanics slation and rotati	on ce, mom mentum t rest	entum	, momen		a,torque,	angular	f simpl
	 Basic Kinem Newto Momen Work a Conse Shock Shock Mech Basic Forms of 	cal quantitie concepts c natics: Tran onian mech tum and energy ervation law claws anics of liqu <u>concepts o</u> teaching: , seminar w	f mechanics slation and rotati anics: Mass, forc s of energy, mor ids and gases a	on ce, mom mentum t rest s	entum	, momen ar mome	ntum			
4	 Basic Kinem Newto Momen Work a Conso Shock Shock Mech Basic Forms of Lecture experim 	cal quantitie concepts c natics: Tran onian mech tum and energy ervation law claws anics of liqu <u>concepts o</u> teaching: , seminar w	f mechanics slation and rotati anics: Mass, forc s of energy, mor lids and gases a <u>f fluid mechanic</u> th practice-orier rents:	on ce, mom mentum t rest s	entum	, momen ar mome	ntum			
4	 Basic Kinem Newto Momen Work a Conse Shock Mech Basic Forms of Lecture experim Participat Formal: Content: 	cal quantitie concepts c natics: Tran onian mech tum and energy ervation law claws anics of liqu concepts of teaching: , seminar w nents) tion requirem No No	f mechanics slation and rotati anics: Mass, forc s of energy, mor lids and gases a f fluid mechanic: ith practice-orier ne	on ce, mom mentum t rest s	entum	, momen ar mome	ntum			
4	 Basic Kinem Newto Moren Work a Conse Shock Mech Basic Forms of Lecture experim Participat Formal: Content: Forms of 	cal quantitie concepts c natics: Tran onian mech tum and energy ervation law claws anics of liqu concepts of teaching: , seminar w nents) tion requirem No assessment:	f mechanics slation and rotati anics: Mass, forc s of energy, mor lids and gases a f fluid mechanic: th practice-orier ents: ne	on ce, mom mentum t rest s nted exe	angul	, momen ar mome	ntum			
4 5 6	 Basic Kinem Newto Momen Work a Conse Shock Mech Basic Forms of Lecture experim Participat Formal: Content: Forms of Written 	cal quantitie concepts c natics: Tran onian mech tum and energy ervation law claws anics of liqu concepts of teaching: , seminar w nents) tion requirem No assessment: examinatio	f mechanics slation and rotati anics: Mass, forc s of energy, mor lids and gases a f fluid mechanic th practice-orien ents: ne ne n; each with preli	on ce, mom mentum t rest s nted exe	angul	, momen ar mome	ntum			
4 5 6 7	 Basic Kinem Newto Momen Work a Conse Shock Mech Basic Forms of Lecture experim Participat Formal: Content: Forms of Written Prerequise 	cal quantitie concepts c natics: Tran onian mech tum and energy ervation law claws anics of liqu concepts of teaching: , seminar w nents) tion requirem No assessment: examinatio site for the aw	f mechanics slation and rotati anics: Mass, forc s of energy, mor lids and gases a f fluid mechanic: th practice-orier ents: ne	on ce, mom mentum t rest s nted exe	entum ,angul ercises examir	, momen ar mome , basic p nation	ntum			

Please note: The German version of this document is the legally binding version. The English translation provided here is for information purposes only.

9	Importance of the grade for the final grade:
	according to BRPO
10	Module coordinator:
	Prof. Dr. rer. nat. Sonja Schöning
11	Other information:
	Literature will be announced at the beginning of the course.
12	Language:
	German

Phy	sics 2								PH2	
Ident num	ification	Workload:	Credits:	Stud	y seme		Frequenc offer	y of the	Duratio	n:
1202		150 h	5	2nd	sem.		Annual (Summe	er)	1 sem	ester
1	Course:	I	Planned group) sizes	Scop	be	Actual o time / classroo teachin	om	Self-stud	dy
	Lecture		60 students		2	weekly hours		h	45	h
	Sem. less	sons	30 students		1	weekly hours	15	h	22.5	h
	Exercise		20 students		0	weekly hours	0	h	0	h
		or seminar	15 students		1	weekly hours	15	h	22.5	h
		ed self-study outcomes/con	60 students		0	weekly hours	0	h	0	h
		tsunderstand	I the essential p	principle	e of the	formatic	on ond n	conortion	e of imaging	gthroug
3	problem familiar They ha on the la their exp Contents - The rad - Vib cou - Wa way - Geo lens	n interrelation with the skills ave practised aboratory exp perimental re- intion laws rations: Basic upled vibratic ves: Basic co ves. Interferer ometrical opt ses, simple opt	s: Heat theory, terms, free un n ncepts of the r nce and diffrac ics/basic con ptical devices,	oherenc n solve eriment ysis of n e practio gas law damped nature a ction, Dc cepts o	e, inter techn ation a neasur cal cou /s, mair dvibra dvibra nd mat oppler e f ray op	rference ical prob nd the pr ement re urse. The theorem tion, free thematica effect ptics, refr	and diff plems in resentat esults an students ns, real g damped al descri	raction. S depende ion of me d the pre s can sys ases, he d vibratic ption of a	Students re ently. Stud easuremen eparation o stematically at transpor n, forced v a wave, sta	ecognise ents are nt results f reports analyse rt, ibration nding
3	problem familiar They ha on the la their exp Contents - The rad - Vib cou - Wa waw - Geo lens - Eler Forms of	n interrelation with the skills ave practised aboratory exp perimental re- ermodynamic iation laws rations: Basic upled vibratic ves: Basic co ves. Interferen ometrical opt ses, simple op ments of wave teaching:	nships and car of simple exp the error analy periments of the sults. :s: Heat theory, c terms, free un n ncepts of the r nce and diffract ics/basic con ptical devices, e optics	oherenc n solve eriment ysis of n e practi- gas law damped nature a ction, Dc cepts o imaging	e, inter techn ation a neasur cal cou vs, mair dvibra dvibra nd mat oppler e f ray op gerrors	rference ical prob nd the pr ement re urse. The tree theorem tion, free thematica offect otics, refr	and diff plems in resentat esults an students ms, real g damped al descri	raction. S depende ion of me d the pre s can sys ases, he d vibratic ption of a maging v	Students re ently. Stud easuremen eparation o stematically at transport n, forced v a wave, sta vith mirrors	ecognise ents are nt results f reports analyse rt, ibration nding
	problem familiar They ha on the la their exp Contents - The rad - Vib cou - Wa waw - Geo lens - Eler Forms of Lecture experim	n interrelation with the skills aboratory exp perimental re- ermodynamic iation laws rations: Basic upled vibratic ves: Basic co ves. Interferer ometrical opt ses, simple op ments of wav- teaching: , seminar with nents)	nships and car of simple exp the error analy periments of the sults. es: Heat theory, c terms, free un n ncepts of the r nce and diffractics/ basic con otical devices, e optics	oherenc n solve eriment ysis of n e practi- gas law damped nature a ction, Dc cepts o imaging	e, inter techn ation a neasur cal cou vs, mair dvibra dvibra nd mat oppler e f ray op gerrors	rference ical prob nd the pr ement re urse. The tree theorem tion, free thematica offect otics, refr	and diff plems in resentat esults an students ms, real g damped al descri	raction. S depende ion of me d the pre s can sys ases, he d vibratic ption of a maging v	Students re ently. Stud easuremen eparation o stematically at transport n, forced v a wave, sta vith mirrors	ecognise ents are nt results f reports analyse rt, ibration nding
	problem familiar They ha on the la their exp Contents - The rad - Vib cou - Wa waw - Geo lens - Eler Forms of Lecture experim	n interrelation with the skills ave practised aboratory exp perimental re- iation laws rations: Basic upled vibration ves: Basic co ves. Interferent cometrical opt ses, simple opt ments of wave teaching: , seminar with nents) ion requirement Cont	nships and car of simple exp the error analy periments of the sults. es: Heat theory, c terms, free un n ncepts of the r nce and diffrac ics/basic con- ptical devices, e optics n practice-orie	oherenc n solve eriment ysis of n e practi- gas law damped nature a ction, Dc cepts o imaging	e, inter techn ation a neasur cal cou vs, main dvibra dvibra fray op gerrors ercises	rference ical prob nd the pr ement re urse. The treat the oren tion, free the matical offect otics, refr	and diff plems in resentat ssults an students ns, real g damped al descri raction, in hysics p	raction. S depende ion of me d the pre s can sys ases, he d vibratic ption of a maging v	Students re ently. Stud easuremen eparation o stematically at transpor n, forced v a wave, sta vith mirrors	ecognise ents are at results f report / analyse rt, ibration nding and
4	problem familiar They ha on the la their exp Contents - The rad - Vib cou - Wa uav - Geo lens - Eler Forms of Lecture experim Participat Formal: Content:	n interrelation with the skills ave practised aboratory exp perimental re- intion laws rations: Basic upled vibratic ves: Basic co- ves. Interferer cometrical opt ses, simple op- ments of wave teaching: , seminar with nents) ion requireme Cont Mod 1198 assessment: examination;	nships and car of simple exp the error analy periments of the sults. s: Heat theory, terms, free un n ncepts of the r nce and diffrac- ics/basic con- ptical devices, e optics n practice-orients: tents of the mo- ule: Physics 1 each with prel	oherenc n solve eriment ysis of n e practi- gas law damped nature a ction, Dc cepts o imaging nted ex- odule Ph	e, inter techn ation a neasur cal cou /s, main d vibra nd mate ppler e f ray op gerrors ercises	rference ical prob nd the pr ement re urse. The theorem tion, free thematica offect otics, refr s, basic p	and diff plems in resentat ssults an students ns, real g damped al descri raction, in hysics p	raction. S depende ion of me d the pre s can sys ases, he d vibratic ption of a maging v	Students re ently. Stud easuremen eparation o stematically at transpor n, forced v a wave, sta vith mirrors	ecognise ents are at results f report / analyse rt, ibration nding and
4	problem familiar They ha on the la their exp Contents - The rad - Vib cou - Wa wav - Geo lens - Eler Forms of Lecture experim Participat Formal: Content:	n interrelation with the skills aboratory exp perimental re- ermodynamic iation laws rations: Basic upled vibratic ves: Basic co ves. Interferer cometrical opt ses, simple opt ments of wave teaching: , seminar with nents) ion requirement Cont Mod 1198 assessment: examination; site for the awa	nships and car of simple exp the error analy periments of the sults. s: Heat theory, terms, free un n ncepts of the r nce and diffractics/basic con obtical devices, e optics n practice-orients: tents of the mo ule: Physics 1	oherenc n solve eriment ysis of n e practi- gas law damped nature a ction, Dc cepts o imaging nted ex- bdule Ph	e, inter techn ation a neasur cal cou /s, mair d vibra d vibra f ray op gerrors ercises ysics 1 examir examir	rference ical prob nd the pro- ement re urse. The theorem tion, free thematica effect ptics, refr s, basic p (1198) in- nation	and diff plems in resentat ssults an students ns, real g damped al descri raction, in hysics p	raction. S depende ion of me d the pre s can sys ases, he d vibratic ption of a maging v	Students re ently. Stud easuremen eparation o stematically at transpor n, forced v a wave, sta vith mirrors	ecognise ents are nt results f reports analyse rt, ibration nding

Please note: The German version of this document is the legally binding version. The English translation provided here is for information purposes only.

	according to BRPO
10	Module coordinator:
	Prof. Dr. rer. nat. Sonja Schöning
11	Other information:
	Literature will be announced at the beginning of the course.
12	Language:
	German

Prac	tical Proje	ect/Internshi	p						PRA	
Ident numt	ification	Workload:	Credits:	Study	y semes	ster:	Frequency offer	of the	Duratio	n:
1292		450 h	15	7th s	sem.		eachsem	nester	12 wee	eks
1	Course:		Planned group sizes		Scope		Actual contact time /classroom teaching		Self-study	
	Lecture		60 students		0	weekly hours	0	h	450	h
	Sem. less	sons	30 students		0	weekly hours	0	h	0	h
	Exercise		20 students		0	weekly hours	0	h	0	h
	Practical	or seminar	15 students		0	weekly hours	0	h	0	h
	Supervise	ed self-study	60 students		0	weekly hours	0	h	0	h
2		outcomes/con			-		-		-	•
			activities and le	•		•			-	
	applied	in a practice	e-oriented man	ner. To	this e	nd, stuc	dents shou	uld work	independ	dently on
	enginee	ering projects	and develop s	uitable	solutio	on strate	egies. The	main ain	n is to dev	elop and
	expand	integration, a	analysis and pro	blems	olving,	present	ation and o	commur	nication sk	ills.
3	Contents									
	Thecon	tents result fr	om the field of a	activity	ofther	especti	ve chosen	compar	ny or enter	prise and
	should i	nclude an en	gineering task.	Atthe	end of t	the work	c term, the	supervi	sing com	oany is to
	prepare	an activity re	port and the stu	idents a	a final re	eport. D	uringthep	ractical	phase, the	students
	should r	eceiveindivi	dual and profes	sionala	advisin	g from t	he supervi	ising univ	versity lec	turers.
4		teaching:								
_			ercises as acco	mpany	/ing gu	idance				
5	Formal:	ion requirement None								
	Content:	None								
6		assessment:								
-	Term pa									
7			rd of credit points		_					
		examination								
8			lle (in the following			-	5.5		=	
		-	g B.Eng., Engine	-				-	-	-
	•		s B.Sc., Renev	vable I	nergie	es B.En	g. and In	dustrial	Engineer	ing and
0		ement B.Sc.	e for the final grad							
9		ce of the grade		е.						
10		coordinator:								
	N.N.									
11	Other info									
			ounced at the b	eginni	ngofth	ecours	e.			
12	Language									
	Germar	1								

I dant	luct and F	rice Manage	ment						PPM	
	ification	Workload:	Credits:	Study	y seme		Frequenc	cy of the	Duratio	n:
numk 1209		150 h	5	5th s	sem.		^{offer} Annual (Winter)		1 seme	ester
1	Course:	L	Planned group	sizes	Scop	he	Actual time / classro teachin		Self-stuc	dy
	Lecture		60 students		3	weekly hours		h	67.5	h
	Sem. less	sons	30 students		1	weekly hours	15	h	22.5	h
	Exercise		20 students		0	weekly hours	0	h	0	h
	Practical	or seminar	15 students		0	weekly hours	0	h	0	h
	Supervise	ed self-study	60 students		0	weekly hours	0	h	0	h
3	design t limits. Th and car concep practica Contents	tools of prog he students u n apply then ts for the ma ality.	ation tools of str ramme, produc inderstand the n in a targeted rketing of prod he instruments policy	et and p mode c d mann lucts th	pricing of actic ner. Stu rough	oolicy an n of the o idents ao out their o	nd can e operativ cquire t entire lif	valuate th e market he comp	neir possib control ins etence to	vilities ar strumer develo
	•	•	oolicy	policy						
	Forms of	Contracting policyBasic concepts of distribution policy		on nolic						
4		teaching:		onpolic	<i>,</i> y					
4	Participat Formal:		S nts:	on polic	, y					
	Participat Formal: Content: Forms of	teaching: , sem. lesson: ion requireme None assessment:	S nts: Ə		-	erforman	ce ex am	ination of	roral exam	ination
5	Participat Formal: Content: Forms of Written Prerequis	teaching: , sem. lesson: ion requirement None assessment: examination,	s nts: e combination e rd of credit point	xamina	-	erforman	ceexam	nination of	r oral exam	nination
5 6 7	Participat Formal: Content: Forms of Written Prerequis Module Applicatio	teaching: , sem. lesson: ion requireme None assessment: examination, iste for the awa examination on of the modu	s nts: e combination e rd of credit point	xaminat s: ig study	tion, pe	nmes)				
5 6 7 8	Participat Formal: Content: Forms of Written Prerequis Module Applicatio Mechat B.Sc. Importan accordi	teaching: , sem. lesson: ion requireme None assessment: examination, site for the awa examination on of the modu ronics B.Sc., l ce of the grade ng to BRPO	s nts: e combination e: rd of credit point pass ile (in the followin	xaminat s: og study ergies B	tion, pe	nmes)				
5	Participat Formal: Content: Forms of Written Prerequis Module Applicatio Mechat B.Sc. Importan accordi Module of	teaching: , sem. lesson: ion requireme None assessment: examination, site for the awa examination on of the modu ronics B.Sc., l ce of the grade ng to BRPO coordinator: rer. oec. Klau	s nts: e combination e rd of credit point pass ile (in the followin Renewable Ene e for the final grad	xaminat s: og study ergies B	tion, pe	nmes)				

Pro	duct Risk I	Vlanagement							PRM	
	tification ber:	Workload:	Credits:	Study	y semes		Frequency offer	/ of the	Durati	on:
121(150 h	5	4th c	or 6th s	em.	Annual (Summei	r)	1 sem	nester
1	Course:		Planned group	sizes	Scop	e	Actual c time / classroo teaching	m	Self-stu	ıdy
	Lecture		60 students		2	weekly hours	30	h	45	h
	Sem. les	sons	30 students		2	weekly hours	30	h	45	h
	Exercise		20 students		0	weekly hours	0	h	0	h
	Practical	or seminar	15 students		0	weekly hours	0	h	0	h
	Supervis	ed self-study	60 students		0	weekly hours	0	h	0	h
	minimis	sation for thes	e products and			•	ts and de s of the m	•		
3	technic Contents - Produ - Produ - Innov - Quali - Projec - Techr - Riskty Meth Meth	al and busine to the cycle act developm ation management ty management ical risk man ypes/risk ider ods of risk ana ods of technic	ent process ement ent agement ntification alysis and risk ra cal and econom	d evalua nt aspec	ate the cts.	success		•		
3	technic Contents - Produ - Produ - Innov - Quali - Projec - Techr - Riskty Meth Meth Riskr Integ Instru - Supp	al and busine at and busine at the cycle at developm ation manage ty management incal risk man ypes/risk idel ods of risk ana ods of risk ana ods of risk ana incanagement ration of risk n iments of eval <u>lier managem</u> teaching:	ent process ement ent agement htification alysis and risk ra cal and econom nstruments and nanagement in uation and doo ent	anking nicriska d proce to the p	ate the cts. assess sses roduct ation	ment	s of the m	neasures		
	technic Contents - Produ - Produ - Innova - Quali - Projec - Techr - Riskty Meth Meth Meth Integ Instru - Supp Forms of Lecture	al and busine at and busine at the cycle at developm ation manage ty management incal risk man ypes/risk idel ods of risk ana ods of risk ana ods of risk ana incanagement ration of risk n iments of eval <u>lier managem</u> teaching:	ent process ement ent agement ntification alysis and risk ra cal and econom nstruments and nanagement in uation and doc <u>nent</u> s with exercises nts:	anking nicriska d proce to the p	ate the cts. assess sses roduct ation	ment	s of the m	neasures		
1	technic Contents - Produ - Produ - Innov - Quali - Projec - Techr - Risk ty Meth Meth Integ Instru - Supp Forms of Lecture Participa Formal: Content:	al and busine at and busine at the cycle at developm ation manage ty management ct management incal risk man ypes/risk idel ods of risk ana ods of technic nanagementi ration of risk n iments of eval <u>lier managem</u> teaching: <u>b, sem. lesson</u> tion requireme <u>None</u> f assessment:	ent process ement ent agement ntification alysis and risk ra cal and econom nstruments and nanagement in uation and doc <u>nent</u> s with exercises nts:	anking nic risk a d proce to the p cumenta	assess assess sses roduct ation	ment develop	s of the m	neasures		
1 5	technic Contents - Produ - Produ - Innova - Quali - Projec - Techr - Risk ty Meth Meth Risk r Integ Instru - Supp Forms of Lecture Participa Formal: Content:	al and busine at and busine at the cycle at developm ation manage ty management ty management ods of risk ana ods of risk ana ods of technic nanagement ration of risk n iments of eval <u>lier management</u> teaching: b, sem. lesson tion requirement None assessment: aper, written e site for the awa	ent process ement ent agement atification alysis and risk ra- cal and econom nstruments and nanagement in uation and door nent s with exercises nts: e examination or or rd of credit point	anking nic risk a d proce to the p cumenta s/case s	assess assess sses roduct ation	ment develop	s of the m	neasures		
4 5	technic Contents - Produ - Produ - Innova - Quali - Projec - Techr - Risk ty Meth Meth Integ Instru - Supp Forms of Lecture Participa Formal: Content: Forms of Term pa Prerequis Module Applicatio	al and busine act life cycle uct developm ation manage ty management ical risk man ypes/risk ider ods of risk ana ods of technic nanagement ration of risk n ments of eval <u>lier management</u> teaching: a, sem. lesson tion requirement <u>None</u> assessment: <u>aper, written e</u> site for the awa <u>e examination</u> on of the modu able Energies	ent process ement ent agement ntification alysis and risk ra- cal and econom nstruments and nanagement in uation and door nanagement in uation and and in uation and in uation and in uation and in uation and in uation and and and and and and and and and an	anking nic risk a d proce to the p cumenta s/case s oral exa s: g study ustrial E	ate the cts. assess sses roduct ation studies minatio	ment develop	mentcyc	cle	s introduc	
1 5 7	technic Contents - Produ - Produ - Innova - Quali - Projec - Techr - Risk ty Meth Meth Integ Instru - Supp Forms of Lecture Participa Formal: Content: Formal Content: Forms of Term pa Module Application Renewa	al and busine act life cycle uct developm ation manage ty management ical risk man ypes/risk ider ods of risk ana ods of technic nanagement ration of risk n ments of eval <u>lier management</u> teaching: a, sem. lesson tion requirement <u>None</u> assessment: <u>aper, written e</u> site for the awa <u>e examination</u> on of the modu able Energies	ent process ement ent agement ntification alysis and risk ra- cal and econom nstruments and nanagement in uation and doc nent s with exercises nts: e examination or or rd of credit point pass le (in the followin	anking nic risk a d proce to the p cumenta s/case s oral exa s: g study ustrial E	ate the cts. assess sses roduct ation studies minatio	ment develop	mentcyc	cle	s introduc	

11	Literature will be announced at the beginning of the course.
12	Language:
	German

	ect 1								PR1	
Ident num	tification	Workload:	Credits:	Study	y semes		Frequen	cy of the	Duratio	on:
1220		150 h	5	4th s	sem.		Annual (Summ	er)	1 sem	ester
1	Course:	<u> </u>	Planned group	sizes	Scop	e	Actual time / classrc teachir		Self-stu	dy
	Lecture		60 students		0	weekly hours	0	h	0	h
	Sem. less	sons	30 students		0	weekly hours	0	h	0	h
	Exercise		20 students		0	weekly hours	0	h	0	h
	Practical	or seminar	15 students		2	weekly hours	30	h	120	h
	Supervise	ed self-study	60 students		0	weekly hours	0	h	0	h
	units an PowerP	nd to presen oint). Critical	hey acquire the t their project comparison ar ences such as t	results nd exam	with t ninatior	he help n leads to	of suita	able softv thinking <i>a</i>	vare tools	(e.g. MS
3	- Stru - Sec eng	ject manage ucturing tasks	sinproduct/pro	oject de		nent				
	- Eng	jineering edu erature review jineering wor	ication / k	ising a s	simplet		l examp	ble from e∖	veryday lif	ein
4	- Eng - Pre Forms of	ineering edu erature review ineering wor sentation teo teaching:	ucation / k :hniques				l examp	le from e∖	veryday lif	ein
4	- Eng - Pre Forms of Project	ineering edu erature review ineering wor sentation teo teaching:	ucation / k hniques ation of the proj nts: e				l examp	ole from e∖	veryday lif	ein
-	- Eng - Pre Forms of Project Participat Formal: Content: Forms of Project	gineering edu erature review gineering wor sentation teo teaching: with presenta ion requireme None assessment: work	ucation / k hniques ation of the proj nts: e	ject rest			l examp	le from ev	veryday lif	e in
5	- Eng - Pre Forms of Project v Participat Formal: Content: Forms of Project v Prerequis Module	gineering edu erature review gineering wor sentation teo teaching: with presenta- tion requireme None assessment: work site for the awa examination	ication / k hniques ation of the proj nts: e e rd of credit point pass and cours	ject resu	ults	t	l examp	le from e∖	veryday lif	ein
5 6 7 8	- Eng - Pre Forms of Project Participat Formal: Content: Forms of Project Prerequis Module Applicatio Renewa	gineering edu erature review gineering wor sentation teo teaching: with presenta- ion requireme None assessment: work site for the awa examination on of the modu able Energies	ication / k hniques ation of the proj nts: e e e ard of credit point pass and cours ile (in the followin B.Eng.	ject resu s: se asses ng study	ults	t	l examp	e from ev	veryday lif	ein
5 6 7 8 9	- Eng - Pre Forms of Project of Participat Formal: Content: Forms of Project of Project of Prerequis Module Application Renewa Importan accordi	gineering edu erature review gineering wor sentation teo teaching: with presenta- tion requireme None assessment: work site for the awa examination on of the modu able Energies ce of the grade ng to BRPO	ication / k hniques ation of the proj nts: e e e rd of credit point pass and cours ile (in the followin	ject resu s: se asses ng study	ults	t	l examp	e from ev	veryday lif	e in
5 6 7 8 9 10	- Eng - Pre Forms of Project * Participat Formal: Content: Forms of Project * Prerequis Module Applicatio Renewa Importan accordi Module o Proj. Dr.	gineering edu erature review gineering wor sentation teo teaching: with presenta- tion requireme None assessment: work site for the awa examination on of the modu able Energies ce of the grade ng to BRPO coordinator: -Ing. Eva Sch	ication / k hniques ation of the proj nts: e e e ard of credit point pass and cours ile (in the followin B.Eng.	ject resu s: se asses ng study de:	ults	t	l examp	e from ev	veryday lif	ein
5 6 7 8 9	- Eng - Pre Forms of Project of Participat Formal: Content: Forms of Project of Project of Prerequis Module Application Renewa Importan accordi Module of Prof. Dr. Other info	gineering edu erature review gineering wor sentation teo teaching: with presenta- ion requireme None assessment: work site for the awa examination on of the modu able Energies ce of the grade ng to BRPO coordinator: -Ing. Eva Sch ormation: re will be ann	ication / k hniques ation of the proj nts: = = = = = = = = = = = = = = = = = = =	ject resu s: se asses de: Ilkamp beginnii	ults ssmen progran	t mmes)			veryday lif	ein

Proi	ect 2								PR2		
-	ification	Workload:	Credits:	Stud	v seme	stor	Frequency	of the	Duratio	าทา	
num		WOI NICAU.	Creaks.	Stud	dy semester:		Frequency of the offer		Duratio	511.	
1221		150 h	5	5th	sem.		Annual (Winter)		1 semester		
							(winter)				
1	Course:		Planned grou	up sizes	Scop	be	Actual c	ontact	Self-stu	dy	
							time /			-	
							classroc teaching				
	Lecture		60 students		0	weekly	0	h	0	h	
						hours		-			
	Sem. less	sons	30 students		0	weekly hours	0	h	0	h	
	Exercise		20 students		0	weekly	0	h	0	h	
			20 010001110		Ŭ	hours			C C		
	Practical	or seminar	15 students		2	weekly	30	h	120	h	
	Cupania	ad a alf atualy	00			hours				1.	
	Supervise	ed self-study	60 students		0	weekly hours	0	h	0	h	
2	Learning	outcomes/co	mpetences:						1		
	The stu	dents maste	er the method	ds and too	ols for	the crea	ation or c	levelopn	nent of a	technical	
	product	or project.	They acquire t	the comp	etence	e to work	goal-orie	ented in s	small orga	anisationa	
	units ar	nd to preser	nt their projec	ct results	with t	he help	of suital	ole softw	vare tools	e.g. MS	
	PowerPoint). Critical comparison and examination leads to linked thinking and action. Students										
	acquire key competences such as teamwor					commu	nication s	kills.			
3	Contents										
0	- Pro	ject manage	ement								
			ks in product/p	oroject de	velopr	nent					
		-	, lem solving u	-			e from eve	erydaylif	e in engir	neering	
	edu	ication	_	-					-	-	
	– Lite	erature reviev	N								
	- Eng	jineering wo	rk								
		sentation te	chniques								
4		teaching:			بالم						
5		ion requireme	ation of the pr	rojectresi	uns						
0	Formal:	Nor									
	Content:	Non									
6		assessment:									
7	Project work Prerequisite for the award of credit points:										
7	-				ssmen	t					
8	Module examination pass and course assessment Application of the module (in the following study programmes)										
	Renewa	ble Energie	s B.Eng.								
9		-	le for the final g	rade:							
10		ng to BRPO									
10			hwenzfeier-H	lellkamp							
11	Other inf										
	him/her	self.	ach case by a	lecturerf	rom th	estudyp	orogramr	ne, chose	en by the	student	
12	Languag										
	Germar	ו									

	omatic Cc	-	-						RT		
lden num	tification ber:	Workload:	kload: Credits:		Study semester:		Frequency of the offer		Duratio	Duration:	
123	ō	150 h	5	4th s	sem.		Annual (Summer)		1 semester		
1	Course:	1	Planned group	o sizes	Scop	De	Actual o time / classroo teaching	om	Self-stud	dy	
	Lecture		60 students		2	weekly hours		h	45	h	
	Sem. less	sons	30 students		1	weekly hours	15	h	22.5	h	
	Exercise		20 students		0	weekly hours	0	h	0	h	
		or seminar	15 students		1	weekly hours	15	h	22.5	h	
2	-	ed self-study outcomes/cor	60 students		0	weekly hours	0	h	0	h	
		dents master									
3	frec - the res - the Contents - Bas - Des	quency doma design of sin ponse metho basic feature sic concepts scription and	gle-loop contr ds es of digital reg of control engi analysis of line	rol loops gulations neering	s by me	eans of rc	oot locus	curvear	nd frequen		
	frec - the resp - the Contents - Bas - Des frec - Pro - Des resp - Bas	quency doma design of sin ponse metho basic feature sic concepts scription and quency doma perties of sin sign of single ponse metho sic features o	ain, gle-loop contr ds es of digital reg of control engi analysis of line ain gle-loop control l	rol loops gulations neering ear, time rol loops oops by	s by me s -invari	eans of ro ant syste time and	oot locus oms in the	curve ar e time do cy doma	nd frequen main and nin		
3	frec - the res - the Contents - Bas frec - Pro - Des res - Bas Forms of Lecture	quency doma design of sin ponse metho basic feature sic concepts scription and quency doma perties of sin sign of single ponse metho sic features o teaching: with accomp	ain, gle-loop contro es of digital reg of control engi analysis of line ain gle-loop contro -loop control l ods f digital regula	rol loops gulations neering ear, time rol loops oops by tions	s by me -invari in the mean	eans of ro ant syste time and s of root lo	oot locus oms in the lfrequen ocus cur	curve ar e time do cy doma	nd frequen main and nin		
	frec - the res - the Contents - Bas frec - Pro - Des res - Bas Forms of Lecture	quency doma design of sin ponse metho basic feature sic concepts scription and quency doma perties of sin sign of single ponse metho sic features of teaching: with accomp ion requireme Non Engi	ain, gle-loop contro ds es of digital reg- of control engi analysis of line ain gle-loop control loop control l ds f digital regula panying semin- nts:	rol loops gulations neering ear, time rol loops oops by tions ar exerc atics 1 (11-	-invari -invari in the mean: ises ar 46 or 1	ant syste time and s of root lo nd practic 150) and	ems in the Ifrequen ocus cur cals	e time do cy doma ve and fr	nd frequen main and nin requency	су 	
1 5	 frec the res the Contents Bas Des frec Pro Pro Des res Bas Forms of Lecture Participat Formal: Content: 	quency doma design of sin ponse metho basic feature sic concepts scription and quency doma perties of sin sign of single ponse metho sic features of teaching: with accomp ion requireme Non Engi com assessment:	ain, gle-loop control ds es of digital reg of control engi analysis of line ain gle-loop control l ods f digital regula banying semin nts: e ules Mathema neering 1 (107) pleted	rol loops gulations neering ear, time rol loops oops by tions ar exerc atics 1 (11- 1 or 1074	s by me -invari in the means ises ar 46 or 1	ant syste time and s of root le nd practic 150) and 2 (1075 or	ems in the Ifrequen ocus cur cals	e time do cy doma ve and fr	nd frequen main and nin requency	су 	
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12	Language:
	German

2	er: Course: Lecture Sem. less Exercise Practical Supervise Learning	Workload: 150 h ons or seminar or seminar od self-study outcomes/con	Credits: 5 Planned group 60 students 30 students 20 students 15 students 60 students	1st s	ly seme sem. Scop 2 2 0		time / classro teachin 30	contact	Durati 1 sem Self-stu 45	nester
1238 1 2	Course: Lecture Sem. less Exercise Practical Supervise Learning	ons or seminar ed self-study	Planned group 60 students 30 students 20 students 15 students		Scor 2 2	weekly hours weekly	Annual (Winter) Actual time / classro teachin 30	contact om g	Self-stu	ıdy
2	Lecture Sem. lesse Exercise Practical o Supervise Learning	or seminar ed self-study	60 students 30 students 20 students 15 students	sizes	2	weekly hours weekly	time / classro teachin 30	om g		
2	Sem. less Exercise Practical Supervise Learning	or seminar ed self-study	30 students 20 students 15 students		2	hours weekly		h	45	h
2	Exercise Practical Supervise Learning	or seminar ed self-study	20 students 15 students			-	30			
2	Practical Supervise Learning	ed self-study	15 students		0			h	45	h
2	Supervise Learning	ed self-study				weekly hours	0	h	0	h
2	Learning	-	60 students		0	weekly hours	0	h	0	h
-	-	outcomes/con			0	weekly hours	0	h	0	h
			npetences: ne range of acti		<i>.</i> .		<i>с</i>	,		· 7
3	Contents: - Situ - Sec bior - Lab - Ran - Exc - Intro pres	ation and pc tor analysis: nass our market ir ge of tasks/ja ursion to reg oduction to th sentations by	tential of the en Solar energy, w	vind po pects f es/pres	wer, hy for the e sentati	rdropowe engineer on by ext	er, geoth in the fie ternal sp	ermal en eld of ren eakers	ergy, use ewable er	nergies
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	Participati Formal: Content:	on requireme None None	Э							
0		assessment: per, written e	examination or p	oroject	work					
7	Prerequisi	ite for the awa	rd of credit points	S:		it				
8	Applicatio		ile (in the followin							
9	Important accordir	ce of the grade	e for the final grad	de:						
		oordinator: -Ing. Eva Sch	nwenzfeier-Hel	<u>lka</u> mp						
11	Other info	ormation:	ounced at the b		ngoftl	ne course	e. Indepe	endent		

12	Language:
	German

001	isors								SEN	
lden num	tification	Workload:	Credits:	Study	y seme		Frequency offer	of the	Duratio	on:
1243		150 h	5	5th s	sem.		Annual (Winter)		1 semester	
1	Course:		Planned group	o sizes	Scop	pe	Actual c time / classroo teaching	m	Self-stu	dy
	Lecture		60 students		2	weekly hours		h	45	h
	Sem. less	sons	30 students		2	weekly hours	30	h	45	h
	Exercise		20 students		0	weekly hours	0	h	0	h
		or seminar	15 students		0	weekly hours	-	h	0	h
2		ed self-study outcomes/con	60 students		0	weekly hours	0	h	0	h
		l of the aener	ation and use of		-		olve pract	•		-
3	new ser Contents - Ser - Fur use Op Ser Ser vari	nsor systems. nsors: Terms, nctionality and of renewable tical transduc nsors for temp nsors: for posi ables,	overview of us d application o e energies, e.g cers and sensc perature meas ition detection	of renew able effo f selecte prs urement and for	ects, u ects, u ed sen: t record	nergies, se and se sors, esp	as well as election recially in	s apply a	nd design	n suitable
3	new ser Contents - Ser Use Op Ser Ser Vari Ser Det	nsor systems. 	overview of us d application o e energies, e.g cers and sensc perature meas	of renew able effe of selecte ors urement and for and angle	vable e ects, u ed sen: t recorc s	nergies, se and se sors, esp ling mec	as well as election recially in hanical a	the field	nd design	n suitable
3	new ser Contents - Ser - Fur use Op Ser Ser Vari Ser Det net Forms of Lecture	nsor systems. nsors: Terms, nctionality and of renewable tical transduc nsors for temp nsors: for posi- fables, nsors for dete cection of che working teaching: , seminar	overview of us d application o e energies, e.g cers and sensc perature meas ition detection ecting paths an emical and biol	of renew able effe of selecte ors urement and for and angle	vable e ects, u ed sen: t recorc s	nergies, se and se sors, esp ling mec	as well as election recially in hanical a	the field	nd design	n suitable
	new ser Contents - Ser - Fur use Op Ser Ser Vari Ser Det net Forms of Lecture	nsor systems. nsors: Terms, nctionality and of renewable tical transduct nsors for temp nsors for deter ables, nsors for deter ection of cher working teaching: , seminar tion requireme None None 1064 1074 1074 1169 1198	overview of us d application o e energies, e.g cers and sense perature meas ition detection ecting paths an emical and biol nts: e ules: Electronics; Electrical Eng Metrology; Physics 1;	of renew able effo f selecte ors urement and for ogical se	able e ects, u ed sen: t recorc s ubstar	nergies, se and se sors, esp ling mec	as well as election recially in hanical a	the field	nd design	n suitable
4	new ser Contents - Ser - Fur use Op Ser Ser Vari Ser Det net Forms of Lecture Participat Formal: Content:	nsor systems. nsors: Terms, nctionality and of renewable tical transduct nsors for temp nsors for deter ables, nsors for deter ection of cher working teaching: , seminar tion requireme None None 1064 1074 1074 1169 1198	overview of us d application o e energies, e.g cers and sensc perature meas ition detection ecting paths an emical and biol nts: e ules: Electronics; Electrical Eng Metrology;	of renew able effo f selecte ors urement and for ogical se	able e ects, u ed sen: t recorc s ubstar	nergies, se and se sors, esp ling mec	as well as election recially in hanical a	the field	nd design	n suitab

7	Prerequisite for the award of credit points:
	Module examination pass
8	Application of the module (in the following study programmes)
	Renewable Energies B.Eng.
9	Importance of the grade for the final grade:
	according to BRPO
10	Module coordinator:
	Prof. Dr. rer. nat. Sonja Schöning
11	Other information:
	Literature will be announced at the beginning of the course.
12	Language:
	German

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7	Prerequisite for the award of credit points:
	70% attendance and active participation; passed semester project and written exam
8	Application of the module (in the following study programmes)
	Electrical Engineering B.Eng, Engineering Computer Sciences B.Eng and Renewable Energies
	B.Eng.
9	Importance of the grade for the final grade:
	according to BRPO
10	Module coordinator:
	Dr. phil. Anna Trebits
11	Other information:
	Literature will be announced at the beginning of the course. Textbook, additional
	materials, intranet self-study courses
12	Language:
	English

	hnical Eng	glish 2							FSE2		
lden num	tification ber:	·····		y semes			Frequency of the offer		Duration:		
108		150 h	5		or 6th ester		Annual (Summer)		1 sem	1 semester	
1	Course:		Planned group	sizes	Scope	9	Actual c time / classroc teaching	m	Self-stu	ıdy	
	Lecture				0	weekly hours	0	h	0	h	
	Sem. less	sons	30 students		4	weekly hours	60	h	90	h	
	Exercise				0	weekly hours	0	h	0	h	
		or seminar			0	weekly hours	0	h	0	h	
	Supervised self-study		30 students		0	weekly hours	0	h	0	h	
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7	Prerequisite for the award of credit points:
	70% attendance and active participation, passed semester project and written exam
8	Application of the module (in the following study programmes)
	Electrical Engineering B.Eng, Engineering Computer Sciences B.Eng and Renewable Energies
	B.Eng.
9	Importance of the grade for the final grade:
	according to BRPO
10	Module coordinator:
	Dr. phil. Anna Trebits
11	Other information:
	Literature will be announced at the beginning of the course. Textbook, course
	supplementary materials self-study courses
	Study programmes in Electrical Engineering, Engineering Computer Sciences, Renewable
	Energies:
	Elective subject
12	Language:
	English

107	tile Techn	ologies							TEX	
	ntification hber:	Workload:	Credits:	Stud	y seme		Frequence offer	cy of the	Durati	on:
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1	Course:		Planned group	Planned group sizes		pe	Actual contact time / classroom teaching		Self-study	
	Lecture		60 students		2	weekly hours	30	h	45	h
	Sem. less	sons	30 students		2	weekly hours	30	h	45	h
	Exercise		20 students		0	weekly hours	0	h	0	h
	Practical	or seminar	15 students		0	weekly hours	0	h	0	h
	Supervise study	ed self	60 students		0	weekly hours	0	h	0	h
2	Learning	outcomes/co	mpetences:							•
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Content: Modules: 1198 Physics 1; 1202 Physics 2; 6 Forms of assessment: Written or oral examination; in each case with preliminary examination performance 7 Prerequisite for the award of credit points: Module examination pass with preliminary examination 8 Application of the module (in the following study programmes) Electrical Engineering B.Eng. and Renewable Energies B.Eng. 9 Importance of the grade for the final grade: according to BRPO		Skills in the sk	the creat ing dem thermal estic hot er plants) hermal u tical cou ems for h rminatior teaching: 5, semina	and in r use of water use. Fur rse (e.g nof the	esidential bu renewable e heating and nctioning of t g. experime drinking wa coefficients	simulat uildings energies d backu he heat nts and ter and	ion mc in the up hea pump simula swimn	low- and ting, swi (geother ations on ning poo	l can ana high-te imming p rmal hea the dim Is as we	emperatu cool hea ting and lensionir l as on th	r results. re range (i ting, solar cooling) ng of solar	ncludin therm	
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9 Importance of the grade for the final grade: according to BRPO	4	Skills in the sk	the creat ing dema thermal estic hot er plants) hermal u tical cou ems for h rmination teaching: semina tion requi	and in r use of water use. Fur rse (e.g eating n of the rements Module 1198 Pl 1202 P ent: camina a award	esidential bu renewable e heating and nctioning of t g. experime drinking wa coefficients coefficients cical course s es: hysics 1; hysics 2;	simulat uildings energies d backu he heat nts and ter and of perfo	ion mo in the up hea simula swimn prmano	low- and ting, swi (geother ations on hing pool ce of a he	d high-te imming p rmal hea the dim ls as wel eat pump	emperatu pool hea ting and nensionir I as on th p)	r results. re range (in ting, solar cooling) ng of solar ne function	ncludir therm	
	4 5 6 7	Skills in the sk	the creat ing dem. thermal estic hot er plants) hermal u tical cou ems for h rmination teaching: semina tion requi	and in r use of water use. Fur rse (e.g eating n of the rements Module 1198 Pl 1202 P ent: camina e award ation pa module	esidential bur renewable e heating and nctioning of t g. experime drinking wa coefficients coefficients coefficients cical course s: hysics 1; hysics 2; ation; in each of credit point ass with preli (in the followir	simulat uildings energies d backu he heat nts and ter and s of perfo	ion mc in the up hea pump simula swimm prmano	iminary e	d can ana d high-te imming p rmal hea the dim ls as wel eat pump	emperatu pool hea ting and nensionir I as on th p)	r results. re range (in ting, solar cooling) ng of solar ne function	ncludir therm	
10 Module coordinator: Prof. Dr. rer. nat. Sonja Schöning	4 5 6 7 8	Skills in the sk	the creat ing dema thermal estic hot er plants) hermal u tical cou ems for h rmination teaching: , semina tion requi	and in r use of water use. Fur rse (e.g eating n of the rements Module 1198 Pl 1202 P ent: camina e award ation pa module grade fo	esidential bur renewable e heating and nctioning of t g. experime drinking wa coefficients coefficients coefficients coefficients coefficients coefficients drinking wa coefficients coefficients coefficients coefficients drinking wa coefficients coeffic	simulat uildings energies d backu he heat nts and ter and sof perfo of perfo	ion mo in the up hea pump simula swimm prmano th prel examir program	iminary e	d can ana d high-te imming p rmal hea the dim ls as wel eat pump	emperatu pool hea ting and nensionir I as on th p)	r results. re range (in ting, solar cooling) ng of solar ne function	ncludir therm	

11	Other information:
	Literature will be announced at the beginning of the course.
12	Language:
	German

The	modynar	THES I							TD1		
dent numl	ification	Workload:	Credits:	Study	/ semes		Frequence	cy of the	Durati	on:	
1267		150 h	5	-	2nd,4th or 6th sem.			Annual (Summer)		1 semester	
1	Course:	I	Planned group	sizes	Scop	e	Actual contact time / classroom teaching		Self-study		
	Lecture		60 students		2	weekly	30	h	45	h	
	Sem. less	sons	30 students		2	hours weekly hours	30	h	45	h	
	Exercise		20 students		0	weekly hours	0	h	0	h	
	Practical	or seminar	15 students		0	weekly hours	0	h	0	h	
	Supervise	ed self-study	60 students		0	weekly hours	0	h	0	h	
	System	atic compete									
3	It should occurrin Commu They ha to expe Contents - Basic and c - 1st la - Ideal chan - 2nd la - Circu petro - Real mate	d be possible ng in technica unicative com ve a commun rts and begin concepts su caloric state v w of thermod gases: Therr ges of state of aw of thermod ular processe of and diesel p fluids, chang rial datacalo	to recognise, d al situations. petence: nicative comma nersand confic uch as system, ariables, proce ynamics: statio nal / caloric equ of ideal gases dynamics: Mea s: simple revers process. Terms: pes of state in the ulations and tak	and of th dently p equilib ess varia nary / n Jation o aning, en sible co Work, p ne two-	nermo iresent rium, s ables w noving f state ntropy mpara perforr	dynamic and def tate vari ork and closed s of ideal s tive proc	end que end que ables, cl heat systems, gases, sp cesses o legree o	kplain the stions of a nanges, p stationar pecific he fideal ga f effective	em argum an unknov processes ry flow pro at capaci uses: Carr eness	wn natu s, therma ocesses ty, simple iot, Joule	
	It should occurrin Commu They ha to expe Contents - Basic and c - 1st la - Ideal chan - 2nd la - Circu petro - Real mate - Fund	d be possible ng in technica unicative com ve a commun rts and begin concepts su caloric state v w of thermod gases: Therr ges of state of aw of thermod ular processe of and diesel p fluids, chang urial data calc amentals of h	to recognise, d al situations. petence: nicative comma nersand confic uch as system, ariables, proce ynamics: statio nal / caloric equ of ideal gases dynamics: Mea s: simple revers process. Terms: pes of state in the ulations and tak	and of th dently p equilib ess varia nary / n Jation o aning, en sible co Work, p ne two-	nermo iresent rium, s ables w noving f state ntropy mpara perforr	dynamic and def tate vari ork and closed s of ideal s tive proc	end que end que ables, cl heat systems, gases, sp cesses o legree o	kplain the stions of a nanges, p stationar pecific he fideal ga f effective	em argum an unknov processes ry flow pro at capaci uses: Carr eness	wn natur s, therma ocesses ty, simple iot, Joule	
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9	Importance of the grade for the final grade:
	according to BRPO
10	Module coordinator:
	Prof. Dr.–Ing. Marcel Beckmann
11	Other information:
	Literature will be announced at the beginning of the course. Renewable Energies study
	programme: Possible elective subject
12	Language:
	German

Elec	tive Modu	le							WM	
Ident numt	ification per:	Workload:	Credits:	Study	y semes	ter:	Frequency offer	of the	Durati	on:
901			5 5		h or 6th sem.		each semester		1 semester	
1	Course:		Planned group s	sizes	Scop	9	Actual co time / classroor teaching		Self-study	
	Lecture		60 students			weekly hours		h		h
	Sem. less	sons	30 students			weekly	/	h		h
	Exercise		20 students			hours weekly hours	/	h		h
	Practical	or seminar	15 students		0	weekly	0	h	0	h
	Supervise	ed self-study	60 students			weekly	/	h		h
2	Learning	outcomes/com	npetences:		1	nouro				
3	Contents									
4	Forms of	teaching:								
5	Formal:	ion requireme	nts:							
6	Content: Forms of	assessment:								
7	Prerequis	site for the awa	rd of credit points	:						
8		on of the modu Ible Energies	ile (in the following B.Eng.	g study	program	nmes)				
9			e for the final grad	e:						
10		coordinator: -Ing. Eva Sch	wenzfeier-Hell	kamp						
11		ormation:								
12	Language Germar									

don	tification	Workload:	Credits:	Stud		tor	-		Duratio	20.	
	iber:	WOI KIOAU:			y semester:		Frequency offer:	or the	Durau	Duration.	
1405		150	5	6th se	emester		Annual		1 sem.		
		100	Ũ	ouro			(Summer)		100111		
1	Course:	Planned group s		sizos	izes: Scope:		Actual		Self-study		
	Course:		Planned group sizes:		Scope:		Actual contact		Self-study		
							time/classroo				
							m teach	ing			
	Lecture		60 students		2	weekly hours	30	h	45	h	
	Sem. les	sons	30 students		1	weekly hours	15	h	22.5	h	
	Exercise		20 students			weekly hours		h		h	
	Practical	or seminar	15 students		1	weekly hours	15	h	22.5	h	
	Supervis	ed self-study	60 students			weekly hours		h		h	
2	-	g outcomes/con									
	Upon su	-	etion of the mode	ule, parti	cipants	will be ab	le to desci	ribe the t	echnologie		
		ydrogen's value chain and the market perspectives of hydrogen as a source of energy. They will be ble to plan possible alternatives to the substitution of conventional sources of energy with hydrogen									
	able to p	olan possible alt	ernatives to the s	substitutio	on of co	onventiona	al sources	of energ	gy with hydi	rogen	
	able to p for simpli	blan possible alt ified applicatior	ernatives to the s ns. Students will l	substitutio ce able te	on of co o desigr	nventiona and cale	al sources culate hyd	of energ	gy with hydrody wi	rogen ants	
	able to p for simpli for speci	plan possible alt ified application ific tasks. Stude	ernatives to the s ns. Students will l ants will be able to	substitutio ce able te	on of co o desigr	nventiona and cale	al sources culate hyd	of energ	gy with hydrody wi	rogen ants	
	able to p for simpli for speci	blan possible alt ified applicatior	ernatives to the s ns. Students will l ants will be able to	substitutio ce able te	on of co o desigr	nventiona and cale	al sources culate hyd	of energ	gy with hydrody wi	rogen ants	
3	able to p for simpli for speci	olan possible alt ified applicatior ific tasks. Stude ecommendation	ernatives to the s ns. Students will l ants will be able to	substitutio ce able te	on of co o desigr	nventiona and cale	al sources culate hyd	of energ	gy with hydrody wi	rogen ants	
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4	Forms of teachin	g:
	Lecture, seminar	lessons and practical course
5	Participation req	uirements:
	Formal:	
	Content:	
6	Form of assessm	ent:
	Written examinat	ion or oral examination
7	Prerequisite for t	he award of credit points:
	Module examina	tion pass
8	Application of th	e module (in the following study programmes):
	Renewable Ener	gies B.Eng.
9	Importance of th	e grade for the final grade:
	according to BR	PO
10	Module coordina	ator:
	Prof. DrIng. Jen	s Haubrock
11	Other information	ר:
12	Language:	
	German	

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	tification	Workload:	Credits:	Study	/ semes		Frequen	cy of the	Durat	ion:	
num 128		150 h	5	5th s	5th sem.			offer Annual (Winter)		1 semester	
1	Course:		Planned group	Planned group sizes		e	Actual contact time / classroom teaching		Self-study		
	Lecture		60 students		2	weekly hours		h	45	h	
	Sem. les	sons	30 students		2	weekly hours	30	h	45	h	
	Exercise	1	20 students		0	weekly hours	0	h	0	h	
	Practical	or seminar	15 students		0	weekly hours	0	h	0	h	
	Supervis	ed self-study	60 students		0	weekly hours	0	h	0	h	
	-		and possible	-	•			cal grid a up the			
	resultin disadva	g problems antages of di		reme	dies. S	Students	s weigh	up the	advant	ages a	
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7	Prerequisite for the award of credit points:
	Module examination pass
8	Application of the module (in the following study programmes)
	Renewable Energies B.Eng.
9	Importance of the grade for the final grade:
	according to BRPO
10	Module coordinator:
	Prof. Dr. rer. nat. Jörn Loviscach
11	Other information:
	Literature will be announced at the beginning of the course.
12	Language:
	German

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dent 1uml	tification ber:	Workload:	Credits:	Study	y semes		Frequency offer	y of the	Durati	on:	
1324		150 h	5	5th \$	5th Semester			Annual (Winter)		1 semester	
1	Course:		Planned group	Planned group sizes		Scope		actual contact time / classroom teaching		Self-study	
	Lecture		60 students		2	weekly hours	30	h	45	h	
	Sem. les	sons	30 students		2	weekly hours	30	h	45	h	
	Exercise	2	20 students		0	weekly hours	0	h	0	h	
	Practical	l or seminar	15 students		0	weekly hours	0	h	0	h	
	Supervis study	ed self g outcomes/con	60 students		0	weekly hours	0	h	0	h	
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	 services and business models Answers to the important questions: What are the effects of the current linear economic system and how can we overcom 										
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7	Prerequisite for the award of credit points:
	Module examination pass
8	Application of the module (in the following study programmes)
	Renewable Energies B.Eng.
9	Importance of the grade for the final grade:
	according to BRPO
10	Module coordinator:
	Prof. DrIng. Eva Schwenzfeier-Hellkamp
11	Other information:
12	Language:
	German

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	itification Iber:	Workload:	Credits:	Stud	y seme		Frequency of the offer		Duratio	Duration:	
1287		150 h	5	5th:	5th sem.		Annual (Summer)		1 semester		
1	Course:		Planned group sizes		Scope		Actual contact time / classroom teaching		Self-study		
	Lecture		60 students		2	weekly hours	30	h	45	h	
	Sem. lessons		30 students		1	weekly hours	15	h	22.5	h	
	Exercise	1	20 students		0	weekly hours	0	h	0	h	
	Practical	or seminar	15 students		1	weekly hours	15	h	22.5	h	
	Supervised self-study		60 students		0	weekly hours	0	h	0	h	
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