Appendix A: Course Schedule

for the study programme Electrical Engineering M.Eng.

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

Specialisation: Networked Electronic Systems

Winter s	emester		L	ST	E	P/S	SSS	СР
Module number	Module title	Module ID						
2026	Electrical Power Management	EPM	2	1	0	1	0	6
2021	Microcontrollers and Applications	MIC	2	1	0	1	0	6
2027	Sensor Systems	SSY	2	1	0	1	0	6
2018	Theoretical Electrical Engineering	TET	2	2	0	0	0	6
9026	Elective Module	WM				0		6
						Tota	I CP:	30
Summer	semester		L	ST	Ε	P/S	SSS	СР
Module	Module title	Module						
number		ID						
2006	Management Skills	MMK	2	2	0	0	0	6
2019	Measuring Systems	MSS	2	1	0	0	0	6
2020	Nonlinear Control Systems	NLR	2	1	0	1	0	6
9026	Elective Module	WM				0		6
2028	Wide Area Networks and IT Security	WIS	2	1	0	1	0	6
		•	•			Tota	I CP:	30
Third ser	nester		L	ST	Ε	P/S	SSS	СР
Module	Module title	Module						
number		ID						
2033	Colloquium	MKO	0	0	0	0	0	6
2034	Master Thesis	MA	0	0	0	0	0	24
						Tota	I CP:	30

Abbreviations of the teaching forms: L = lecture, ST = tuition in seminars, E = exercise, S = seminar, P = practical, SSS = supervised self-study (all data in semester credit hours);

CP = credit points

W/S = winter/summer semester

Elective N	Modules Electrical Engineering M.E	ng.							
Module	Module title	Module	W/	L	ST	Е	P/S	SSS	CP
number		ID	S						
2024	Project 1	PRE1	S	0	0	0	1	0	6
2031	Project 2	PRE2	W	0	0	0	1	0	6
2025	Compulsory Elective 1	WPF1	S	0	4	0	0	0	6
2032	Compulsory Elective 2	WPF2	W	0	4	0	0	0	6

Appendix B: Course Schedule

for the study programme Electrical Engineering M.Eng.

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Specialisation: Intelligent Energy Systems

Winter se	emester		L	ST	Е	P/S	SSS	СР
Module number	Module title	Module ID						
2026	Electrical Power Management	EPM	2	1	0	1	0	6
2029	Intelligent Energy Systems	IES	2	1	0	1	0	6
2030	Human-Machine Interaction	MMI	0	4	0	0	0	6
2018	Theoretical Electrical Engineering	TET	2	2	0	0	0	6
9026	Elective Module	WM				0		6
						Tota	I CP:	30
Summer	semester		L	ST	Ε	P/S	SSS	СР
Module	Module title	Module						
number		ID						
2023	Efficient Energy Systems	EES	2	1	0	1	0	6
2006	Management Skills	MMK	2	2	0	0	0	6
2019	Measuring Systems	MSS	2	1	0	0	0	6
2022	Smart Grids	SG	2	1	0	1	0	6
9026	Elective Module	WM				0		6
						Tota	I CP:	30
Third ser	nester		L	ST	Ε	P/S	SSS	CP
Module	Module title	Module						
number		ID						
2033	Colloquium	MKO	0	0	0	0	0	6
2034	Master Thesis	MA	0	0	0	0	0	24
						Tota	I CP:	30

Abbreviations of the teaching forms: L = lecture, ST = tuition in seminars, E = exercise, S = seminar, P = practical, SSS = supervised self-study (all data in semester credit hours);

CP = credit points

W/S = winter/summer semester

Elective I	Modules Electrical Engineering M.E	ng.							
Module number	Module title	Module ID	W/ S	L	ST	Е	P/S	SSS	СР
2024	Project 1	PRE1	S	0	0	0	1	0	6
2031	Project 2	PRE2	W	0	0	0	1	0	6
2025	Compulsory Elective 1	WPF1	S	0	4	0	0	0	6
2032	Compulsory Elective 2	WPF2	W	0	4	0	0	0	6

Appendix C: Module catalogue

for the study programme Electrical Engineering M.Eng.

Efficient Energy Systems	14
Electrical Power Management	16
Intelligent Energy Systems	18
Colloquium	19
Management Skills	20
Master Thesis	21
Human-Machine Interaction	22
Measuring Systems	24
Microcontrollers and Applications	25
Nonlinear Control Systems	26
Project 1	27
Project 2	28
Sensor Systems	29
Smart Grids	30
Theoretical Electrical Engineering	31
Elective Module	33
Compulsory Elective 1	34
Compulsory Elective 2	35
Wide Area Networks and IT Security	36

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

Iden	tification	Workload:	Credits:	Study	semes	ter:	Frequenc	y of the	Durati	on:
num 202		180 h	6	1st o	r 2nd s	em.	offer Annual (Summe	r)	1 sem	ester
1	Course:		Planned group s	sizes	Scop	e	Actual time / c	lassroom	Self-stu	dy
	Lecture		60 students		2	SCH	30	h	60	h
	Tuition in	n seminars	30 students		1	SCH	15	h	30	h
	Exercise		20 students		0	SCH	0	h	0	h
	Practical	or seminar	15 students		1	SCH	15	h	30	h
	Superviso	ed self-study	60 students		0	SCH	0	h	0	h
2	The stu- quantific select m as devel regard to	cation of energaterials in a ta op new energo their energy	he basic relation gy efficiency. The rgeted manner are sy-efficient complefficiency, critical sy, efficiency and se	ney can and thus in conents a	apply to mprove and system mpare to	he releva the ener stems. The	nt proced gy efficie ney can e	ures, i.e. p ncy of exi valuate tec	perform ca sting syste chnical sy	alculation ems as we stems wi
	- Ration - Energ - Metho Practica Concept	nal use of ener y harvesting ods for determ ls ual design and	n buildings and b rgy in electrical a ining energy effi d implementation transfer, phase ch	pplication of energy (ons (in includi gy effi	dustry, congline long-	ommerce term mon	itoring)	ected syste	
4		teaching:	141	1						
5		tion requirement	d teaching, pract	icai coui	rse					
	Formal:	Non								
	Content:	Non	e							
6		assessment:	each case with pr	eliminar	v exan	nination				
7			ed of credit points:		<i>y</i>					
	Module	examination p	pass with prelimi	nary exa	minati	on				
			le (in the following	g study pi	rogramı	nes)				
8		al Engineering								
		-	for the final grade:							
	_									
9	accordir	ng to MRPO Officer:								
9	accordin Module (Officer:	ja Schöning							
8 9 10	accordir Module (Prof. Dr	_	ja Schöning							

	Designation of the research or development project Long-term research cooperation "mieletec" with the company Miele &Cie. KG, Research project "NanoInduction"	
12	Language:	Ī
	German	

	etrical Pow	er Managemer	nt						EPM	
Iden num	tification ber:	Workload:	Credits:	Study	semes	ter:	Frequency	of the	Durati	on:
202		180 h	6	1st o	r 2nd s	em.	Annual (Winter)		1 sem	ester
1	Course:		Planned group s	izes	Scop	e	Actual of time / cl	assroom	Self-stu	dy
	Lecture		60 students		2	SCH	30	h	60	h
		n seminars	30 students		1	SCH	15	h	30	h
	Exercise		20 students		0	SCH	0	h	0	h
		or seminar	15 students		1	SCH	15	h	30	h
2	•	ed self-study outcomes/comp	60 students		0	SCH	0	h	0	h
3	- le se - u se ne ir	earn about uncensorless low- nderstand the nafety, available etwork feedbaspection systems.	rol and networking onventional control	rol strate and redu file of ar veness ar ss of er	egies s ndant noptim noptim nd flex nergy	uch as fu safety ap nal autom ibility, a	nzzy controplications action solutes well as	ol, observ tion also i the assess	er-oriente ncludes of sment of o	d contro peration lynamic
	- S - M - In	pace vector re lethods of fuz	presentation and zy control and the buses in network	field ori eir appli	entation	in drives		vstems		
	- D	· ·	struction of a sen	sorless 4	4Q dri	ve with the	he aid of a	powerful	microcon	ıtroller
4	- D Forms of Lecture,	esign and con teaching: seminar-base	d teaching and la					•		
5	- D Forms of Lecture,	Design and conteaching:	d teaching and la					•		
5	- D Forms of Lecture, Participa Formal: Content: Forms of	teaching: seminar-base tion requiremen None assessment:	d teaching and la	boratory	exerc	ises in sr	nall group	•		
	- D Forms of Lecture, Participa Formal: Content: Forms of Written Prerequise	tion requirement None assessment: examination, of the for the awar	d teaching and la	boratory	exerc	ises in sr	nall group	•		
5 6 7	- D Forms of Lecture, Participa Formal: Content: Forms of Written Prerequis Module	tion requirement None assessment: examination, site for the awar examination p	d teaching and la ts: e e combination exar d of credit points:	boratory	or ora	ises in sr	nall group	•		
5	- D Forms of Lecture, Participa Formal: Content: Forms of Written Prerequis Module Applicati	tion requirement None assessment: examination, site for the awar examination p	d teaching and la ts: e e combination exar d of credit points: bass le (in the following	boratory	or ora	ises in sr	nall group	•		

10	Module Officer:
	Prof. Dr. Ing. habil. Klaus Hofer
11	Other information:
	Literature will be announced at the beginning of the course. Participants must have sufficient knowledge and experience in handling and the safety of electrical equipment. Laboratory exercises on electrical machines and power electronics of the bachelor's degree study programme in electrical engineering should have been completed.
12	Language:
	German

11110	elligent Ene	rgy Systems							IES	
	ntification aber:	Workload:	Credits:	Study	semest	er:	Frequency	y of the	Durati	ion:
202	9	180 h	6	1st o	r 2nd so	em.	Annual (Winter)		1 sem	nester
1	Course:		Planned group si	zes	Scope))	Actual of time / conteaching	lassroom	Self-stu	ıdy
	Lecture		60 students		2	SCH	30	h	60	h
	Tuition in	n seminars	30 students		1	SCH	15	h	30	h
	Exercise		20 students		0	SCH	0	h	0	h
	Practical	or seminar	15 students		1	SCH	15	h	30	h
	Supervise	ed self-study	60 students		0	SCH	0	h	0	h
2	Learning	outcomes/com	petences:		1	ļ				<u> </u>
			eliability and safet	ty of en	ergy sy	stems.				
3	Contents:									
		l power plants								
			eneration system							
			nergy-efficient ene							
			t and energy data							
			for plant and ener cy of energy system		neering	5				
	Practical	ls								
	Design a		_							
			on of a smart ener	gy syste	em					
4	Forms of	teaching:								
4	Lecture,	teaching: seminar-base	d teaching, practic							
5	Lecture,	teaching:	d teaching, practic							
	Lecture, Participat	teaching: seminar-base tion requiremen	d teaching, praction tts:							
	Lecture, Participat Formal: Content:	teaching: seminar-base tion requirement Non-	d teaching, praction tts:							
5	Lecture, Participat Formal: Content: Forms of	teaching: seminar-base tion requirement Non Non assessment:	d teaching, praction tts:	cal cour	rse	nary exa	nmination	performai	nce	
5	Lecture, Participat Formal: Content: Forms of Written Prerequis	teaching: seminar-base tion requirement Non Non assessment: or oral examinite for the awar	d teaching, practicuts: e e nation; in each cased of credit points:	cal cour	rse		nmination	performar	nce	
5	Lecture, Participat Formal: Content: Forms of Written Prerequis Module	teaching: seminar-base tion requirement Non Non assessment: or oral examinite for the awar examination p	d teaching, practice tts: e e nation; in each case d of credit points: bass with prelimin	cal cour	rse prelimi minatio	on	nmination	performai	nce	
5 6 7	Lecture, Participat Formal: Content: Forms of Written Prerequis Module Applicati	teaching: seminar-base tion requirement Non Non assessment: or oral examination pon of the modu	d teaching, practicuts: e e nation; in each cased of credit points: pass with prelimin le (in the following	cal cour	rse prelimi minatio	on	nmination	performar	nce	
5 6 7 8	Lecture, Participat Formal: Content: Forms of Written Prerequis Module Applicati Electrica	teaching: seminar-base tion requirement Non Non assessment: or oral examination pon of the modulal Engineering	d teaching, practice tts: e e nation; in each case d of credit points: bass with prelimin le (in the following g M.Eng.	cal cour	rse prelimi minatio	on	nmination	performar	nce	
5 6 7 8	Lecture, Participat Formal: Content: Forms of Written Prerequis Module Applicati Electrica Important	seminar-base seminar-base seminar-base Non Non assessment: or oral examination pon of the modu al Engineering ce of the grade	d teaching, practicuts: e e nation; in each cased of credit points: pass with prelimin le (in the following	cal cour	rse prelimi minatio	on	nmination	performai	nce	
5 6 7 8	Lecture, Participat Formal: Content: Forms of Written Prerequis Module Applicati Electrica Important accordin	seminar-base tion requirement Non Non assessment: or oral examination properties of the modulal Engineering ce of the grade ag to MRPO	d teaching, practice tts: e e nation; in each case d of credit points: bass with prelimin le (in the following g M.Eng.	cal cour	rse prelimi minatio	on	amination	performai	nce	
5 6 7 8	Lecture, Participat Formal: Content: Forms of Written Prerequis Module Applicati Electrica Important accordin Module O	teaching: seminar-base tion requirement Non Non assessment: or oral examination pon of the modulal Engineering to MRPO Officer:	d teaching, practice tts: e e nation; in each case d of credit points: bass with prelimin le (in the following g M.Eng. for the final grade:	ee with pary exa	rse prelimi minatio	on	amination	performar	nce	
5 6 7 8 9	Lecture, Participat Formal: Content: Forms of Written Prerequis Module Applicati Electrica Importana accordin Module O Prof. Dr	teaching: seminar-base tion requirement Non Non assessment: or oral examinite for the awar examination pon of the modulal Engineering to of the grade to MRPO Difficer: -Ing. Eva Sch	d teaching, practice tts: e e nation; in each case d of credit points: bass with prelimin le (in the following g M.Eng.	ee with pary exa	rse prelimi minatio	on	amination	performar	nce	
5	Lecture, Participat Formal: Content: Forms of Written Prerequis Module Applicati Electrica Importan accordin Module O Prof. Dr	teaching: seminar-base tion requirement Non Non assessment: or oral examination properties of the modulal Engineering to MRPO Officer: -Ing. Eva Schormation:	d teaching, practicuts: e e e nation; in each cased of credit points: bass with prelimin le (in the following M.Eng. for the final grade: hwenzfeier-Hellka	ee with pary exa	prelimi minatio	on nes)	amination	performar	nce	
5 6 7 8 9	Lecture, Participat Formal: Content: Forms of Written Prerequis Module Applicati Electrica Importan accordin Module O Prof. Dr	seminar-base seminar-base seminar-base seminar-base ion requirement Non Non assessment: or oral examination points for the awar examination points for the modulal Engineering see of the grade of the g	d teaching, practice tts: e e nation; in each case d of credit points: bass with prelimin le (in the following g M.Eng. for the final grade:	ee with pary exa	prelimi minatio	on nes)	amination	performar	nce	

Coll	oquium								MKC)
Ident numb	ification oer:	Workload:	Credits:	Study	y semes	ter:	Frequence	cy of the	Durati	ion:
2033	3	180 h	6	3rd s	sem.		each sei	mester		
1	Course:		Planned group s	sizes	Scop	e		contact assroom	Self-stu	ıdy
	Lecture		60 students		0	SCH	0	h	180	h
	Tuition in	seminars	30 students		0	SCH	0	h	0	h
	Exercise		20 students		0	SCH	0	h	0	h
		or seminar	15 students		0	SCH	0	h	0	h
	Supervise	ed self-study	60 students		0	SCH	0	h	0	h
	scientific its non-s	c topic of the r ubject-related	e candidate is on a candidate	subject-1	related	foundati	ions, its ir	iterdiscipli	nary conn	tifying the
3	- D	ontent of the t isputation on to ontext of the th	hesis according the procedure in nesis			of the t	hesis and	the question	ons that ar	ose in the
4	Forms of Oral exa		he master thesis							
5	Participat	ion requiremen	ts:							
	Formal:	None	-							
	Content:		tment of the mas	ter thesi	S					
6		assessment:								
7	Oral exa		d of credit points:							
,	Trerequis	ite for the awar	d of credit points.							
8			le (in the following	• •	_					
		l Engineering	M.Eng., Mecha	nical En	gineeri	ng M.So	e. and Opt	timisation a	and Simul	ation
	M.Sc.	C.1 1	c 4 c 1 1							
9	•	ce of the grade in grade in the	for the final grade:							
10	Module C		uhan ole							
11	Other info	-Ing. Jens Har	UDFOCK							
11			ounced at the beg	ginning o	of the c	ourse.				
12	Language	<u>.</u>								
	German									

	nagement S	skills							MMK	
Ident	tification ber:	Workload:	Credits:	Study	y semest	er:	Frequency offer	of the	Durati	on:
2006	6	180 h	6	1st	or 2	nd sem.	Annual (Summer)	1 sem	ester
1	Course:		Planned group s	sizes	Scope	e	Actual c time / cl teaching	assroom	Self-stu	dy
	Lecture		60 students		2	SCH	30	h	60	h
	Tuition in	n seminars	30 students		2	SCH	30	h	60	h
	Exercise		20 students		0	SCH	0	h	0	h
		or seminar	15 students		0	SCH	0	h	0	h
	Supervise	ed self-study	60 students		0	SCH	0	h	0	h
	have lea own bel themselv	rned to analys haviour/percep wes, to work so	connection betwee se entrepreneuria ption more reali accessfully in a to sensibly with his	l measu istically. team and	res fror They I to rea	n differe can use	ent perspect e methods	tives. The	ey can eva vate empl	aluate the oyees an
3	profession protection reference manager excellen	onal and methon, energy ares, intercultu	nning, motivatio odological comp nd resource eff ral managemen nagement, targe	etence, g iciency, t, globa t trackin	general sustai al deve	legal iss nable e elopmen	ues, occup conomic t and pr ling, balar	ational sata activities, oduction aced score	fety, envir code of strategies e card, te	conmental German , project
_	Forms of		0		nflict 1		nent, stre	ss and t	time mar	
4	_	nication in the	event of a crisis.		nflict 1		nent, stre	ss and t	time mar	
4	Lectures	nication in the	event of a crisis.		nflict 1		ment, stre	ss and t	time mar	
5		teaching:	event of a crisis. exercises ts:		nflict 1		nent, stre	ss and t	time mar	
	Participat	teaching: s, case studies, tion requiremen	event of a crisis. exercises ts:		nflict 1		ment, stre	ss and t	time mar	
	Participat Formal: Content: Forms of	teaching: s, case studies, tion requiremen None assessment:	event of a crisis. exercises ts:			managei		ss and t	ime mar	
5	Participal Formal: Content: Forms of Written Prerequis	ication in the teaching: s, case studies, tion requirement None None assessment: examination, site for the awar	event of a crisis. exercises ts: e e combination exa			managei		ss and t	ime mar	
6	Participal Formal: Content: Forms of Written Prerequis Module	teaching: s, case studies, tion requirement None None assessment: examination, of the for the awar examination p	event of a crisis. exercises ts: e e combination exad d of credit points:	mination	n or ora	nanager I examir		ss and t	ime mar	
6	Participat Formal: Content: Forms of Written Prerequis Module Applicati Electrica	incation in the teaching: s, case studies, tion requirement None None assessment: examination, exite for the awar examination pon of the modu	event of a crisis. exercises ts: e e combination exa	mination g study p	n or ora	l examin	nation			nagement
5	Participat Formal: Content: Forms of Written Prerequis Module Applicati Electrica M.Sc. Importan	iteaching: s, case studies, tion requirement None Rassessment: examination, site for the awar examination p on of the modu al Engineering	exercises ts: e combination exact d of credit points: pass le (in the following	mination g study panical En	n or ora	l examin	nation			nagement
5 6 7 8	Participat Formal: Content: Forms of Written Prerequis Module Applicati Electrica M.Sc. Importan accordin	ication in the teaching: s, case studies, tion requirement None None assessment: examination, site for the awar examination pron of the modulal Engineering to MRPO	event of a crisis. exercises ts: e e combination exact d of credit points: bass le (in the following M.Eng., Mecha	mination g study panical En	n or ora	l examin	nation			nagement
5 6 7 8	Participat Formal: Content: Forms of Written Prerequis Module Applicati Electrica M.Sc. Importan accordin	incation in the teaching: s, case studies, tion requirement None None assessment: examination, of the for the awar examination pron of the modulal Engineering to MRPO Officer:	event of a crisis. exercises ts: e e combination exa d of credit points: bass le (in the following g M.Eng., Mecha for the final grade:	mination g study panical En	n or ora	l examin	nation			nagement
5 6 7 7 8 8	Participat Formal: Content: Forms of Written Prerequis Module Applicati Electrica M.Sc. Importan accordin Module G Prof. Dr	incation in the teaching: s, case studies, tion requirement None None assessment: examination, of the for the awar examination pron of the modulal Engineering to MRPO Officer:Ing. Bruno F	event of a crisis. exercises ts: e e combination exa d of credit points: bass le (in the following g M.Eng., Mecha for the final grade:	mination g study panical En	n or ora	l examin	nation			nagement
5 6 7 8 9	Participat Formal: Content: Forms of Written Prerequis Module Applicati Electrica M.Sc. Importan accordin Module O Prof. Dr	incation in the teaching: s, case studies, tion requirement None None sassessment: examination, examination properties of the awar examination properties of the grade ag to MRPO Officer:Ing. Bruno Formation:	event of a crisis. exercises ts: e e combination exact d of credit points: bass le (in the following M.Eng., Mecha for the final grade:	mination g study pr nical En	n or ora	l examin	nation			nagement
5 6 7 7 8 8	Participat Formal: Content: Forms of Written Prerequis Module Applicati Electrica M.Sc. Importan accordin Module O Prof. Dr	ication in the teaching: s, case studies, ton requirement None None assessment: examination, of the for the awar examination properties of the grade ag to MRPO Officer:Ing. Bruno Formation: re will be annoted to the studies of the grade agent of the grade a	event of a crisis. exercises ts: e e combination exa d of credit points: bass le (in the following g M.Eng., Mecha for the final grade:	mination g study pr nical En	n or ora	l examin	nation			nagemen

ivias	ter Thesis								M.A.	
Iden	tification ber:	Workload:	Credits:	Stud	y semest	er:	Frequency	of the	Durati	on:
2034	4	720 h	24	3rd	sem.		each sem	ester	20 we	eks
1	Course:		Planned grou	p sizes	Scope	e	Actual of time/cla teaching	ssroom	Self-stu	dy
	Lecture		60 students		0	SCH	0	h	720	h
	Tuition in	seminars	30 students		0	SCH	0	h	0	h
	Exercise		20 students		0	SCH	0	h	0	h
	Practical of	or seminar	15 students		0	SCH	0	h	0	h
	Supervise	d self-study	60 students		0	SCH	0	h	0	h
2	in the int	•	y contexts, wor	king inde	pendent	ly and ac	ecording to	o scientifi	c methods	
3										
3	The mas	ter thesis is me with a de	an independer scription and ex onceptual or de sible.	kplanation	of its so	olution. I	t can also	be detern	nined by ar	n empirica
4	The mas	ter thesis is me with a de tion or by c forms is poss	scription and exonceptual or de	kplanation	of its so	olution. I	t can also	be detern	nined by ar	n empirica
	The mas programminvestigated of these forms of Written of	teaching:	scription and exonceptual or desible.	xplanation sign tasks	of its so	olution. I	t can also	be detern	nined by ar	n empirica
4	The mass programminvestigated of these forms of Written of Participated	ter thesis is me with a de tition or by c forms is poss teaching: composition ion requireme	scription and exonceptual or desible. with faculty tutnts:	xplanation sign tasks	of its so	olution. I	t can also	be detern	nined by ar	n empirica
	The mas programminvestigated of these forms of Written of Participated Formal:	teaching: composition ion requireme	scription and exonceptual or desible. with faculty tutnts:	splanation sign tasks oring	of its so	olution. I n evalua	t can also tion of ex	be detern isting sou	nined by ar	n empirica
4 5	Forms of Written of Participat Formal:	teaching: composition ion requireme Note	scription and exonceptual or desible. with faculty tutnts:	splanation sign tasks oring	of its so	olution. I n evalua	t can also tion of ex	be detern isting sou	nined by ar	n empirica
4 5	Forms of Written of Participat Formal:	teaching: composition ion requireme	scription and exonceptual or desible. with faculty tutnts:	splanation sign tasks oring	of its so	olution. I n evalua	t can also tion of ex	be detern isting sou	nined by ar	n empirica
5 6	Forms of Written of Participat Formal: Content:	teaching: composition ion requireme Not assessment:	scription and exonceptual or desible. with faculty tutnts:	oring from the s	of its so	olution. I n evalua	t can also tion of ex	be detern isting sou	nined by ar	n empirica
4 5 5 7	Forms of Written of Participat Forms of Prerequisi	teaching: composition ion requireme Nor cossessment:	with faculty tutnts: ne ordinated topic for and of credit point	eoring from the s	of its so s or by a	olution. In evalua	t can also tion of ex	be detern isting sou	nined by ar	n empirica
4 5 6 7	Forms of Written of Participat Formal: Content: Forms of Prerequisi	teaching: composition ion requireme Not assessment: ite for the awa	with faculty tut nts: ne ordinated topic f	oring from the s	of its so s or by a student's	special s	t can also tion of ex subject are	be determ isting sou	nined by an arces. A co	n empirica ombinatio
4 5 6 7	Forms of Written of Participate Formal: Content: Forms of Prerequisite Electrical M.Sc.	teaching: teaching: composition ion requireme Non coassessment: ite for the awa on of the mod l Engineerin	with faculty tut nts: ne ordinated topic for and of credit point ule (in the follow g M.Eng., Mecl	oring from the s ing study p hanical En	of its so s or by a student's	special s	t can also tion of ex subject are	be determ isting sou	nined by an arces. A co	n empirica ombinatio
4 5 5 6 6 7 8 8	Forms of Written of Participate Formal: Content: Forms of Prerequisite Electrica M.Sc. Importance	teaching: teaching: composition ion requireme Non coassessment: ite for the awa on of the mod l Engineerin	with faculty tut nts: ne ordinated topic f	oring from the s ing study p hanical En	of its so s or by a student's	special s	t can also tion of ex subject are	be determ isting sou	nined by an arces. A co	n empirica ombinatio
4 5 7 8	Forms of Written of Participate Formal: Content: Forms of Prerequisite Electrica M.Sc. Importance	teaching: teaching: composition ion requireme Nor Coc assessment: ite for the awa on of the mod al Engineerin ce of the grade g to MRPO	with faculty tut nts: ne ordinated topic for and of credit point ule (in the follow g M.Eng., Mecl	oring from the s ing study p hanical En	of its so s or by a student's	special s	t can also tion of ex subject are	be determ isting sou	nined by an arces. A co	n empirica ombinatio
4 5 6 7 8	Forms of Written of Participate Formal: Content: Forms of Prerequisis Electrica M.Sc. Important accordin Module C. Prof. Dr.	teaching: teaching: teaching: composition ion requireme Not assessment: itte for the awa on of the mod l Engineerin tee of the grade g to MRPO Officer: -Ing. Jens H	with faculty tut nts: ne ordinated topic to urd of credit point ule (in the follow g M.Eng., Mecl	oring from the s ing study p hanical En	of its so s or by a student's	special s	t can also tion of ex subject are	be determ isting sou	nined by an arces. A co	n empiric.
4 5 6 7 8 9	Forms of Written of Participate Formal: Content: Forms of Prerequisite Electrica M.Sc. Importance according Module C. Prof. Dr. Other info	teaching: teaching: composition ion requireme Not assessment: ite for the awa on of the mod l Engineerin te of the grade g to MRPO Officer: -Ing. Jens H ormation:	with faculty tut nts: ne ordinated topic for the follow g M.Eng., Mecl	oring from the series: ing study per hanical Ende:	of its so s or by a student's	special s	t can also tion of ex subject are	be determ isting sou	nined by an arces. A co	n empiric.
4 5	Forms of Written of Participate Formal: Content: Forms of Prerequisite Electrica M.Sc. Importance according Module C. Prof. Dr. Other info	teaching: teaching: teaching: composition ion requireme Nor Coor assessment: ite for the awa on of the mod al Engineerin tee of the grade g to MRPO officer: -Ing. Jens H ormation: e will be ann	with faculty tut nts: ne ordinated topic to urd of credit point ule (in the follow g M.Eng., Mecl	oring from the series: ing study per hanical Ende:	of its so s or by a student's	special s	t can also tion of ex subject are	be determ isting sou	nined by an arces. A co	n empirica ombinatio

Hum	an-Machin	ne Interaction								MMI	
Ident numb	ification er:	Workload:		Credits:	Study	semeste	er:	Frequency offer	of the	Duratio	on:
2030				6	1st or	or 2nd sem.		Annual (Winter)		1 semester	
1	Course:		Planned group sizes			Scope		Actual contact time / classroom teaching		Self-study	
	Lecture		60	students		0	SCH	0	h	0	h
	Tuition in	seminars	30	students		4	SCH	60	h	120	h
	Exercise		20) students		0	SCH	0	h	0	h
	Practical of	or seminar	15	students		0	SCH	0	h	0	h
	Supervise	d self-study	60	students		0	SCH	0	h	0	h
2	Learning	outcomes/comp	eten	ces:						1	

Students design, implement and evaluate human-machine interfaces in a methodical way. In doing so, they observe and use the possibilities and limits of the human being and take into account the applicable standards and regulations. They assess which design approaches and which technical ways of implementation can be expected to be effective and efficient. They can develop the components of such human-machine interfaces on the basis of existing hardware and software libraries and turn them into a functional system that has been tested.

3 Contents:

- Continuous theme: Applications related to electrical engineering and in particular power engineering (building automation, smart home, demand-side management, electric vehicles, grid control, control and maintenance, ...)
- Models of human perception and action
- Attention, human error
- Disabilities and accessibility
- Quality characteristics, standards, basic concepts, procedure models
- Methods of requirements analysis, design and prototyping of human-machine interfaces
- Methods for the investigation of human-machine interfaces, statistical evaluation
- Overview of programming techniques: event-based programming, web programming, multitouch programming
- Sensors and actuators for mobile computing and pervasive computing
- Virtual reality and augmented reality
- Information visualisation
- Persuasive computing, gamification
- Basic concepts and applications of machine learning for "intelligent" human-machine interfaces

The development of solutions for partial aspects of problems from practice, integration and testing in experiments is integrated into the seminar. Development platform: current PC peripherals and/or smartphone/tablet technology.

4	Forms of teaching:
	Seminar-based teaching
5	Participation requirements:

	Formal:	None
	Content:	None
6	Forms of assessm	ent:
	Written examina	ation or oral examination
7	Prerequisite for th	e award of credit points:
	Module examina	ation pass
8	Application of the	module (in the following study programmes)
	Electrical Engin	eering M.Eng.
9	Importance of the	grade for the final grade:
	according to MF	RPO
10	Module Officer:	
	Prof. Dr. rer. na	t. Jörn Loviscach
11	Other information	
	Literature will b	e announced at the beginning of the course.
12	Language:	
	German	

Meas	suring Syst	ems							MSS	
Identi	ification per:	Workload:	Credits:	Study	semest	er:	Frequency offer	of the	Durati	on:
2019		180 h	6	1st o	r 2nd so	em.	Annual (Summer)	1 sem	ester
1	Course:		Planned group siz	zes	Scope	e	Actual c time / cl teaching	assroom	Self-stu	dy
	Lecture		60 students		2	SCH	30	h	60	h
	Tuition in	seminars	30 students		1	SCH	15	h	75	h
	Exercise		20 students		0	SCH	0	h	0	h
	Practical of	or seminar	15 students		0	SCH	0	h	0	h
	_	d self-study	60 students		0	SCH	0	h	0	h
2	_	outcomes/comp								
		analysis capal								
			essing, especially							
			tence of virtual m	neasurii	ng and	sensor s	ystems			
2		m solving skil	Is in a team							
3	Contents:		1 . 1							
		nentals of sign signal proces								
	_		ment technology							
			uring and sensor s	systems	2					
			ne systems on mic	•						
	- Scienti		ie systems on mie	лоргос	CBBOIB					
4	Forms of t	teaching:								
	Lecture,	seminar teach	ing							
			nall groups (2 to 3	5)						
5		on requirement	s:							
	Formal:	None								
	Content:	None	;							
6		assessment:	m omol o							
7			r oral examination of credit points:	1						
7	_	examination p	-							
8			e (in the following	study ni	Ogramn	nes)				
U		l Engineering		zaay pi	251 MIIIII)				
9			for the final grade:							
	_	g to MRPO								
10	Module O	fficer:								
			Westerwalbesloh							
11	Other info									
			unced at the begin							
	Participa	nts should hav	ve their own licen	ce for l	LabVIE	W for s	elf-study			
12	Language	•								
	German									

Mic	rocontrolle	rs and Applic	eations						MIC				
	tification	Workload:	Credits:	Stud	y semes	ter:	Frequenc	y of the	Durati	on:			
202	1	180 h	6	1st o	or 2nd s	em.	Annual (Winter)		1 sem	ester			
1	Course:	l	Planned group s	izes	Scop	e	Actual time / c teachin	lassroom	Self-stu	dy			
	Lecture		60 students		2	SCH	30	h	60	h			
	Tuition ir	seminars	30 students		1	SCH	15	h	30	h			
	Exercise		20 students		0	SCH	0	h	0	h			
	Practical	or seminar	15 students		1	SCH	15	h	30	h			
	Supervise	ed self-study	60 students		0	SCH	0	h	0	h			
2	Learning	outcomes/com	petences:		-1	-1			-	•			
			erent analogue and	d digita	l interfa	aces and	evaluate	them.					
3	Contents:												
	Analogu Digital p	gramming e and digital processing and s:	interfaces d dissemination of				nd digital	periphery					
4	Forms of	teaching:											
			ed teaching, practi	ical cou	rse								
5		ion requiremen											
	Formal:	Non											
	Content:	Non	ie										
6		assessment:		*.1	1.		. ,.	C					
7			nation; in each card of credit points:	se with	prenm	mary exa	imination	performan	ice				
7	_		pass with prelimit	aoru ov	minati	on							
8			ile (in the following										
0		l Engineering	, ,	, study p	rogramm	iles)							
			for the final grade:										
9	accordin	-											
9		S to Min O											
9	Module C												
			s Hesse										
	Prof. Dr.	Officer: -Ing. Thomas ormation:		inning	of the c	ourse.							
10	Prof. Dr.	Officer: -Ing. Thomas ormation: re will be ann	s Hesse ounced at the beg	inning	of the c	ourse.							

	linear Cont	rol Systems							NLR				
Iden num	tification ber:	Workload:	Credits:	Study	semest	er:	Frequency offer	of the	Duration	on:			
202	0	180 h	6	1st o	r 2nd s	em.	Annual (Summer)	1 sem	ester			
1	Course:		Planned group si	zes	Scope	e	Actual c time / cl teaching	assroom	Self-stu	dy			
	Lecture		60 students		2	SCH	30	h	60	h			
	Tuition in	seminars	30 students		1	SCH	15	h	30	h			
	Exercise		20 students		0	SCH	0	h	0	h			
	Practical	or seminar	15 students		1	SCH	15	h	30	h			
	Supervise	d self-study	60 students		0	SCH	0	h	0	h			
2		outcomes/comp			•	•	•	•	•	*			
	nonlinea	r, concentrated	ocedures for both d parametric syste	n the an ems	alysıs a	nd synti	nesis of co	ntrol syste	ems and co	ontrols o			
3	Contents:												
	Analysis												
	Lyapunov stability theoryControllability and observability												
		s of nonlinear input/output li	control systems:										
		mput/output n state linearisat											
		state iiiicarisat											
	1 - 1)1TTere	ential flatness	1011										
	- Differe	ential flatness	.01										
4													
4	Forms of	teaching:		cal cour	rse								
4	Forms of Lecture,	teaching:	I teaching, practic	cal cou	rse								
	Forms of Lecture,	teaching: seminar-based	I teaching, practic	cal cou	rse								
	Forms of Lecture, Participat Formal: Content:	teaching: seminar-basection requirement None None	1 teaching, practices:	cal cour	rse								
	Forms of Lecture, Participat Formal: Content: Forms of	teaching: seminar-based ion requirement None None assessment:	d teaching, practices:		rse								
5	Forms of Lecture, Participat Formal: Content: Forms of Written of	teaching: seminar-based ion requirement None None assessment: examination o	d teaching, practices:		rse								
5	Forms of Lecture, Participat Formal: Content: Forms of Written of Prerequise	teaching: seminar-based ion requirement None None assessment: examination o ite for the award	I teaching, practices: continuous practices: r oral examination of credit points:		rse								
5 6 7	Forms of Lecture, Participat Formal: Content: Forms of Written of Prerequis: Module of	teaching: seminar-based ion requirement None None assessment: examination o ite for the award examination p	d teaching, practices: croral examination of credit points: ass	n									
6	Forms of Lecture, Participat Formal: Content: Forms of Written of Prerequise Module of Application	teaching: seminar-based ion requirement None None assessment: examination o ite for the award examination p on of the modul	I teaching, practices: Toral examination of of credit points: ass e (in the following	n study pi	ogramn								
5 6 7 8	Forms of Lecture, Participat Formal: Content: Forms of Written of Prerequis: Module of Application BioMech	teaching: seminar-based ion requirement None None assessment: examination of ite for the award examination p on of the modul natronics M.So	d teaching, practices: r oral examination of of credit points: ass e (in the following e. and Electrical I	n study pi	ogramn								
5 6 7 8	Forms of Lecture, Participat Formal: Content: Forms of Written of Prerequise Module of Application BioMech Important	teaching: seminar-based ion requirement None None assessment: examination of ite for the award examination p on of the modul natronics M.So ce of the grade for	I teaching, practices: Toral examination of of credit points: ass e (in the following	n study pi	ogramn								
5 6 7 8	Forms of Lecture, Participat Formal: Content: Forms of Written of Prerequise Module of Application BioMech Important accordin	teaching: seminar-based ion requirement None None assessment: examination of ite for the award examination p on of the modul natronics M.So ce of the grade to g to MRPO	d teaching, practices: r oral examination of of credit points: ass e (in the following e. and Electrical I	n study pi	ogramn								
5 6 7 8	Forms of Lecture, Participat Formal: Content: Forms of Written of Prerequise Module of Application BioMech Important accordin Module of	teaching: seminar-based ion requirement None None assessment: examination o ite for the award examination p on of the modul natronics M.So ee of the grade of g to MRPO Officer:	I teaching, practices: Toral examination of credit points: ass I (in the following control of the final grade:	n study pi	ogramn								
5 6 7 8 9	Forms of Lecture, Participat Formal: Content: Forms of Written of Prerequise Module of Application BioMech Important accordin Module of Prof. Dr.	teaching: seminar-based ion requirement None None assessment: examination of ite for the award examination p on of the modul natronics M.So be of the grade for g to MRPO Officer: -Ing. Dirk We	I teaching, practices: Toral examination of credit points: ass I (in the following control of the final grade:	n study pi	ogramn								
5 6 7 8	Forms of Lecture, Participat Formal: Content: Forms of Written of Prerequis: Module of Application BioMech Important accordin Module Of Prof. Dr. Other info	teaching: seminar-based ion requirement None None assessment: examination of ite for the award examination p on of the modul natronics M.So be of the grade to g to MRPO Officer: -Ing. Dirk Web	teaching, practices: r oral examination of of credit points: ass e (in the following e. and Electrical For the final grade:	n study pi Enginee	ogramn ring M	Eng.							
5 6 7 8 9	Forms of Lecture, Participat Formal: Content: Forms of Written of Prerequis: Module of Application BioMech Important accordin Module Of Prof. Dr. Other info	teaching: seminar-based ion requirement None None assessment: examination of ite for the award examination pon of the modul natronics M.So is e of the grade to g to MRPO Officer: -Ing. Dirk Web ormation: e will be annoted to the semination of the modul natronics of the grade to	I teaching, practices: Toral examination of credit points: ass I (in the following control of the final grade:	n study pi Enginee	ogramn ring M	Eng.							

Proj	ect 1								PRE1	
Iden	tification ber:	Workload:	Credits:	Stud	y semest	er:	Frequency	of the	Duratio	on:
202	4	180 h	6	1st o	or 2nd so	em.	Annual (Summer)	1 sem	ester
1	Course:		Planned group s	izes	Scope	e	Actual c time / cl teaching	assroom	Self-stud	dy
	Lecture		60 students		0	SCH	0	h	0	h
	Tuition ir	seminars	30 students		0	SCH	0	h	0	h
	Exercise		20 students		0	SCH	0	h	0	h
		or seminar	15 students		1	SCH	15	h	165	h
	_	ed self-study	60 students		0	SCH	0	h	0	h
2		outcomes/cor	npetences:					· ·		
	- Scient	ific work								
		y to work in								
		unication sk	tills							
	- Motiv									
			nking and acting							
3	Contents:									
	_	_	of research and de	velopm	ent task	s in the	respective	chosen sp	pecialisatio	on.
		t manageme	nt							
	- Comm	nunication								
	- Know	ledge manag	gement							
	- Literat	ture review								
		eering work								
	- Presen	tation								
4	Forms of		1.2							
_			1–3 participants							
5		ion requireme								
	Formal:	No								
_	Content:	No	ne							
6		assessment:								
7		ation exam	ard of credit points:							
7	•	examination	•							
8			pass lule (in the following	etudy 5	rograma	nes)				
o	~ ~	on of the mod d Engineerin	-	, stady p	10graiiill	100)				
9			e for the final grade:							
	_	g to MRPO	- B301							
10	Module C									
		Ing. Dirk Z	lielke							
	Other info		- :==							
11		Jimanon.								
11			nounced at the beg	inning	of the co	ourse.				
11		e will be anı	nounced at the beg	inning	of the co	ourse.				

Pro	ject 2								PRE2	
Iden	tification	Workload:	Credits:	Study	y semest	er:	Frequenc	y of the	Duratio	on:
203	1	180 h	6	1st o	r 2nd s	em.	Annual (Winter)		1 sem	ester
1	Course:	l	Planned group si	izes	Scop	e	Actual of time / c	lassroom	Self-stu	dy
	Lecture		60 students		0	SCH	0	h	0	h
	Tuition in	seminars	30 students		0	SCH	0	h	0	h
	Exercise		20 students		0	SCH	0	h	0	h
	Practical	or seminar	15 students		1	SCH	15	h	165	h
	_	ed self-study	60 students		0	SCH	0	h	0	h
2	_	outcomes/com	petences:				· 			
		ific work								
	- Ability	to work in a	team							
		unication ski								
	- Motiva	ation								
	- Interco	onnected thin	king and acting							
3	Contents:									
	Independ	dent solving o	of research and de	velopm	ent tasl	s in the	respective	chosen s	pecialisatio	on.
	- Projec	t managemen	t							
	- Comm	unication								
	- Knowl	ledge manage	ement							
	- Literat	ure review								
	- Engine	eering work								
	- Presen	tation								
4	Forms of	teaching:								
			-3 participants							
5		ion requiremen								
	Formal:	Non	e							
	Content:	Non	e							
6	Forms of	assessment:								
	Project v	vork								
7	Prerequis	ite for the awa	rd of credit points:							
	Module	examination j	pass							
8			ile (in the following	study p	rogramn	nes)				
		l Engineering								
9			for the final grade:							
		g to MRPO								
10	Module C									
		-Ing. Dirk Zi	elke							
11	Other info									
	_		ounced at the begi	inning o	of the c	ourse.				
12	Language	:								
	German									

Sens	or System	s							SSY	
Identi numb	ification er:	Workload:	Credits:	Stud	ly semest	ter:	Frequency offer	y of the	Durati	ion:
2027		180 h	6	1st o	or 2nd s	em.	Annual (Winter)		1 sem	nester
1	Course:		Planned group s	sizes	Scop	e	Actual of time / conteaching	lassroom	Self-stu	ıdy
	Lecture		60 students		2	SCH	30	h	60	h
	Tuition in	n seminars	30 students		1	SCH	15	h	30	h
	Exercise		20 students		0	SCH	0	h	0	h
	Practical	or seminar	15 students		1	SCH	15	h	30	h
	Supervise	ed self-study	60 students		0	SCH	0	h	0	h
2	Deepeni systems	and the outsic	ding knowledge a le world. In the p ontrollers analyse	rocess,						
	- A - R - P - M 2. Digit 3. Sens	or interfaces a	ensors ensors es	ler coup		a micro	controller	board.		
4	Forms of	teaching:								
•		-	ed teaching, pract	ical cou	ırse					
5		tion requiremen								
	Formal:	Non	e							
	Content:	Non	e							
6	Written	assessment: examination, tion performa	combination exa	minatio	n or ora	l examii	nation; eac	h with pre	liminary	
7	_		rd of credit points: pass with prelimi	nary ex	aminati	on				
8	Applicati		le (in the following							
9	Importan		for the final grade:							
10	Module (Officer:	alka							
		Ing. Dirk Zionmation:	CINC							
11	Culci IIII	OLIHUUIVII.								
11	Literatuu		ounced at the beg	oinning	of the c	ourse				

Sma	rt Grids									SG	
Ident	tification ber:	Workl	oad:	Credits:	Stud	y semest	er:	Frequenc offer	y of the	Duratio	on:
2022	2	180 h		6	1st c	or 2nd s	em.	Annual (Summe	r)	1 sem	ester
1	Course:	<u> </u>		Planned group s	sizes	Scop	e		contact lassroom	Self-stud	dy
	Lecture			60 students		2	SCH	30	h	55	h
	Tuition in	n seminar	S	30 students		1	SCH	15	h	22.5	h
	Exercise			20 students		0	SCH	0	h	0	h
	Practical			15 students		1	SCH	15	h	22.5	h
	Supervise			60 students		0	SCH	0	h	0	h
2	Learning	outcome	s/compet	ences:							
	_		_	nt of models a							
				development	of solut	ion stra	tegies, i	mplement	tation and	verificatio	n using a
	simulatio				1	1					
			•	em security and cation of the sy			•	ontrolicae	l anarou au	etame cual	h oc emos
				ration and sma			on or dec	entransec	renergy sy	stems such	n as sma
				ply systems	ii Const	illicis.					
	2,41441	on or o n	018) Sup	pro systems							
3	Contents:										
	Intellige	nt electr	ical ener	gy systems (si	mart gri	ds), sys	tem con	trol and s	ystem servi	ices. Energ	gy
	manager				C			•		·	- ·
	System r	nonitori	ng and i	dentification of	of critica	l situati	ions.				
	Improve	ment of	the trans	smission prope	erties of	electric	cal powe	r transmis	ssion. Use	of FACTS	5.
	-										
4	Forms of			. 1. 1							
-				teaching and p	practical	.S					
5	Participat Formal:	ion requi	None None								
	Content:			e 1060, Electri	ool Note	vorka f	rom DA	dograo pr	o oromno l	PCE or ac	uivalant
	Content.		Module		cai Nei	WOIKS II	IOIII DA	degree pr	ogramme i	NGE of eq	urvaient
				lectrical Netw	orks:						
			1000 2	1000110011110011	5111 5,						
6	Forms of	assessme	ent:								
6	Term pa	per or ex	kam acco	ompanying the	e course				_		
6 7	Term pa	per or exite for the	cam acco	of credit points:							
7	Term par Prerequis Module	per or exite for the examina	kam acco e award o ation pas	of credit points: s and course a	ssessme						
	Term pa Prerequis Module Application	per or exite for the examination of the	cam acco e award o tion pas module (of credit points: s and course a in the following	ssessme		nes)				
7	Term pa Prerequis Module Application Electrication	per or exite for the examination of the all Engine	cam according award of award of award of award of award of the award of awa	of credit points: s and course a fin the following LEng.	ssessme g study p		nes)				
7	Term pa Prerequis Module Application Electrica Important	per or exite for the examination of the langing ce of the	cam according award of the awar	of credit points: s and course a in the following	ssessme g study p		nes)				
7 8 9	Term pa Prerequis Module Applicati Electrica Important accordin	per or exite for the examination of the langing ce of the g to MR	cam according award of the awar	of credit points: s and course a fin the following LEng.	ssessme g study p		nes)				
7	Term pa Prerequis Module Application Electrical Important accordin Module C	per or exite for the examination of the all Engine ce of the g to MR	e award of tion pas module (eering M grade for	of credit points: s and course a fin the following LEng. the final grade:	ssessme g study p		nes)				
7 8 9	Term pa Prerequis Module Application Electrical Important accordin Module C Prof. Dr.	per or exite for the examination of the all Engine ce of the g to MR Officer: Jefficer: Jefficer:	e award of tion pas module (eering M grade for PO	of credit points: s and course a fin the following LEng. the final grade:	ssessme g study p		nes)				
7 8 9	Term pay Prerequis Module Application Electrica Important accordin Module C Prof. Dr. Other info	per or exite for the examination of the discount Engine ce of the g to MR Officer: July 1 Ing. Je ormation	cam accorded award of a tion passion module (exering Margrade for EPO	of credit points: s and course a fin the following LEng. the final grade:	ssessme g study p		nes)				
7 8 9	Term pay Prerequis Module Application Electrica Important accordin Module C Prof. Dr. Other info	per or exite for the examination of the discount of the g to MR Officer: -Ing. Je ormation rids by I	cam accorded award of a tion passion module (exering Margrade for EPO	of credit points: s and course a fin the following LEng. the final grade:	ssessme g study p		nes)				

		ectrical Eng							TET	
	ntification	Workload:	Credits:	Study	semes	ter:	Frequency	of the	Durati	on:
201	iber: 8	180 h	6	1st o	r 2nd s	em.	offer Annual (Winter)		1 sem	ester
1	Course:		Planned group s	sizes	Scop	e	Actual of time / cl	assroom	Self-stu	dy
	Lecture		60 students		2	SCH	30	h	60	h
	Tuition i	n seminars	30 students		2	SCH	30	h	60	h
							0	1.		
	Exercise		20 students		0	SCH	0	h	0	h
	Practical	or seminar	15 students		0	SCH	0	h	0	h
	Supervis	ed self-study	60 students		0	SCH	0	h	0	h
2	Learning	outcomes/co	mnetences:							-
3	Contents	:								
	- N	I athematical	basics and tools							
	 Mathematical basics and tools Maxwell's equations: Formulation in integral and differential form Magneto- and electrostatics, slow-varying electric and magnetic fields and fast-varying electromagnetic fields, electromagnetic waves, eddy currents, induction, nano- and micromagnetism Theoretical description of semiconductor devices (pn-, Schottky junction, field effect 									
		ansistors,)	conducto	raevic	es (pn-,	senouky j			
	tr	ansistors, computation	al methods in theor	retical el	ectrica	l engine	ering			
	- T - P	ansistors, computation heory and p lement Met ossibilities a	al methods in theorems along the contractice of numerical hod (FEM) etc.) and limits of numerical transfer and limits of numerical t	retical el al simula	ectrica ition m	l engine	ering	erence M	ethod (FD	M), Finit
	- T - P	ansistors, computation heory and p lement Met	al methods in theorems along the contractice of numerical hod (FEM) etc.) and limits of numerical transfer and limits of numerical t	retical el al simula	ectrica ition m	l engine	ering	erence M	ethod (FD	M), Finit
4	- C - T E - P	ansistors, computation heory and p lement Met ossibilities a	al methods in theorems along the contractice of numerical hod (FEM) etc.) and limits of numerical transfer and limits of numerical t	retical el al simula	ectrica ition m	l engine	ering	erence M	ethod (FD	M), Finit
4	Forms of Lecture,	ansistors, computation cheory and p lement Met cossibilities a cpplication e teaching: exercise, pi	al methods in theoretice of numerical hod (FEM) etc.) and limits of numerical examples	retical el al simula	ectrica ition m	l engine	ering	erence M	ethod (FD	M), Finit
4 5	Forms of Lecture,	ansistors, computation heory and p lement Met ossibilities a pplication e teaching: exercise, po tion requirem	al methods in theoreractice of numerical hod (FEM) etc.) and limits of numerical examples ractical course ents:	retical el al simula	ectrica ition m	l engine	ering	erence M	ethod (FD	M), Finit
	Forms of Lecture, Participa	ansistors, computation cheory and p lement Met cossibilities a application e teaching: exercise, pi tion requirem	al methods in theoreractice of numerical hod (FEM) etc.) and limits of numerical examples ractical course ents:	retical el al simula	ectrica ition m	l engine	ering	erence M	ethod (FD	M), Finit
5	Forms of Lecture, Participa Formal:	ansistors, computation cheory and p lement Met cossibilities a pplication e teaching: exercise, pr tion requirem No	al methods in theoreractice of numerical hod (FEM) etc.) and limits of numerical examples ractical course ents:	retical el al simula	ectrica ition m	l engine	ering	erence M	ethod (FD	M), Finit
	Forms of Lecture, Participa Formal: Content:	ansistors, computation cheory and p lement Met cossibilities a cpplication e teaching: exercise, p tion requirem No assessment:	al methods in theoreractice of numerical hod (FEM) etc.) and limits of numerical examples reactical course ents: one	retical el al simula rical met	ectrica ation m	l enginee ethods (i	ering	erence M	ethod (FD	M), Finit
5	Forms of Lecture, Participa Formal: Content: Forms of Term pa	ansistors, computation cheory and p lement Met cossibilities a cpplication e teaching: exercise, p tion requirem No assessment: uper, written	al methods in theoretical course ents: one examination or co	retical el al simula rical met	ectrica ation m	l enginee ethods (i	ering	erence M	ethod (FD	M), Finit
5	Forms of Lecture, Participa Forms of Term pa Prerequise	ansistors, computation cheory and p lement Met cossibilities a cpplication e teaching: exercise, pr tion requirem No assessment: cper, written site for the aw	al methods in theoreractice of numerical hod (FEM) etc.) and limits of numerical examples ractical course ents: one one examination or covard of credit points:	retical el al simula rical met	ectrica ation m	l enginee ethods (i	ering	erence M	ethod (FD	M), Finit
5	Forms of Lecture, Participa Formal: Content: Forms of Term pa Prerequis Module	ansistors, computation cheory and p lement Met cossibilities a pplication e teaching: exercise, pr tion requirem No assessment: aper, written site for the aw examination	al methods in theoreractice of numerical hod (FEM) etc.) and limits of numerical examples ractical course ents: One examination or covard of credit points: In pass	retical el al simula rical met	ectrica ation m hods	l enginee ethods (i	ering	erence M	ethod (FD	M), Finit
5 6 7	Forms of Lecture, Participa Formal: Content: Forms of Term participa Application Application Application Contents Conten	ansistors, computation cheory and p lement Met cossibilities a pplication e teaching: exercise, pr tion requirem No assessment: aper, written site for the aw examination	al methods in theoreractice of numerical hod (FEM) etc.) and limits of numerical examples ractical course ents: one examination or covard of credit points: n pass dule (in the following	retical el al simula rical met	ectrica ation m hods	l enginee ethods (i	ering	erence M	ethod (FD	M), Fini
5 6 7	Forms of Lecture, Participa Formal: Content: Forms of Term pa Prerequis Module Applicati Electrica	ansistors, computation cheory and p lement Met cossibilities a pplication e teaching: exercise, pr tion requirem No No assessment: per, written site for the aw examination on of the mo al Engineeri	al methods in theoreractice of numerical hod (FEM) etc.) and limits of numerical examples ractical course ents: one examination or covard of credit points: n pass dule (in the following	retical el al simula rical met mbination	ectrica ation m hods	l enginee ethods (i	ering	erence M	ethod (FD	M), Fini
5 6 7 8	Forms of Lecture, Participa Formal: Content: Forms of Term pa Prerequis Module Applicati Electrication	ansistors, computation cheory and p lement Met cossibilities a capplication e teaching: exercise, p tion requirem No cassessment: cassessment: cassessment capper, written site for the aw examination con of the mo cal Engineeri ce of the grace ag to MRPO	al methods in theoretactice of numerical hod (FEM) etc.) and limits of numerical examples ractical course ents: one one examination or covard of credit points: n pass dule (in the following mg M.Eng. le for the final grade:	retical el al simula rical met mbination	ectrica ation m hods	l enginee ethods (i	ering	erence M	ethod (FD	M), Fini
5 6 7 8	Forms of Lecture, Participa Formal: Content: Forms of Term pa Prerequis Module Applicati Electricati Important accordin	ansistors, computation cheory and p lement Met cossibilities a capplication e teaching: exercise, p control on requirem No cassessment: cassessment: cassessment con of the aw examination con of the mo cal Engineeri ce of the grace ag to MRPO Officer:	al methods in theoretactice of numerical hod (FEM) etc.) and limits of numerical examples ractical course ents: one one examination or covard of credit points: n pass dule (in the following mg M.Eng. le for the final grade:	retical el al simula rical met mbination	ectrica ation m hods	l enginee ethods (i	ering	erence M	ethod (FD	M), Fini

		Literature will be announced at the beginning of the course.
1	2	Language:
		German

Elec	tive Modul	WM											
Iden	tification ber:	Workload:		Credits:	Study	Study semester:			Frequency of the offer		ion:		
9020	6	180 h		6	1st o	1st or 2nd sem.		each semester		1 semester			
1	Course:			Planned group si	zes	Scope		Actual contact time / classroom teaching		Self-str	udy		
	Lecture		(50 students			SCH		h		h		
	Tuition in	seminai	rs :	30 students			SCH		h		h		
	Exercise		,	20 students			SCH		h		h		
	Practical of	or semin	ar	15 students		0	SCH	0	h	0	h		
	Supervised self-study		udy	60 students			SCH		h		h		
2	Learning	outcome	s/compete	ences:			1	1	-	•	•		
3	Contents:												
4	Forms of	teaching	:										
5		Participation requirements:											
	Formal:												
	Content:												
6	Forms of	assessme	ent:										
7	Prerequisi	te for th	e award o	f credit points:									
8	Application	on of the	module (in the following	study pr	ogramn	nes)						
	Electrica												
9	Importance	e of the	grade for	the final grade:									
10	Module C												
	Prof. Dr.			elke									
11	Other info	ormation	:										
12	Language												
	German												

Con	ompulsory Elective 1									WPF1	WPF1	
Ident	ification Workload		:			y semest	er:	y of the	e Duration:			
2025	5	180 h				or 2nd s	em.	offer Annual (Summer)		1 sem	1 semester	
1	Course:	!	P	lanned group siz	Scope		Actual contact time / classroom teaching		Self-study			
	Lecture		6) students		0	SCH	0	h	0 h		
	Tuition in	seminars	30) students		4	SCH	60	h	120	h	
	Exercise		20) students		0	SCH	0	h	0	h	
	Practical of	or seminar	1:	5 students		0	SCH	0	h	0	h	
	Supervised self-study) students		0	SCH	0	h	0	h	
2	Learning	outcomes/co	ompeter	nces:								
3	Contents:											
4	Forms of	teaching:										
-	Participation requirements:											
5												
	Formal: None Students can attend any module from the programme syllabus of the consecutive master's degree study programmes at Bielefeld University of Applied Sciences to prior arrangement with the programme directors. The selected module must not be compulsory module of the respective specialisation taken.									ciences b		
6	Forms of	assessment:										
7	_	ite for the avexaminatio		credit points:								
8	Application	Application of the module (in the following study programmes) Electrical Engineering M.Eng.										
9	Importance		de for t	he final grade:								
10	Module C											
11	Other info		Zieike									
11			nnound	ed at the begi	nning (of the c	ourse					
12	Language			13 41 410 0081		0						
	German											

Con	Compulsory Elective 2										WPF2	
Ident	ification Workloa		oad:	Credits:		Study semester: Frequenc offer				Durati	Duration:	
2032	2	180 h		6	1st c	or 2nd s	em.	Annual (Winter)		1 semester		
1	Course:			Planned group s	izes	Scop	e	Actual time / c teachin	lassroom	Self-stu	dy	
	Lecture			60 students		0	SCH	0	h	0	h	
	Tuition in	seminai	rs .	30 students		4	SCH	60	h	120	h	
	Exercise			20 students		0	SCH	0	h	0	h	
	Practical of	or semin	ar	15 students		0	SCH	0	h	0	h	
	Supervise	d self-st	udy	60 students		0	SCH	0	h	0	h	
2	Learning	outcome	s/compe	etences:		<u> </u>	<u>.</u>				,	
3	Contents:											
4	Forms of	teaching	:									
5	Participation requirements:											
	Formal: None											
	Content: Students can attend any module from the programme syllabus of the con master's degree study programmes at Bielefeld University of Applied Scie prior arrangement with the programme directors. The selected module must compulsory module of the respective specialisation taken.								ciences b			
6	Forms of	assessm	ent:									
7	Prerequisi	ite for th	e award	of credit points:								
	Module 6	examina	ation pa	iss								
8				e (in the following	study p	rogramn	nes)					
	Electrica	l Engin	eering l	M.Eng.								
9	Importance of the grade for the final grade:											
	accordin		RPO									
10		Module Officer:										
	Prof. DrIng. Dirk Zielke Other information:											
11					11	. £ 41. ·						
10			e annou	inced at the beg	ınnıng (or the c	ourse.					
12	Language	•										
	German											

Wid	e Area Ne	works and I	Γ Security						WIS							
Iden num	tification ber:	Workload:	oad: Credits:		/ semest	er:	Frequency offer	y of the	Durati	on:						
202	3	180 h	6	1st o	r 2nd s	em.	Annual (Summer)		1 sem	ester						
1	Course:		Planned group s	Planned group sizes		e	Actual of time / cl	assroom	Self-stu	dy						
	Lecture		60 students		2	SCH	30	h	60	h						
	Tuition in	n seminars	30 students		1	SCH	15	h	30	h						
	Exercise		20 students		0	SCH	0	h	0	h						
	Practical	or seminar	15 students		1	SCH	15	h	30	h						
	_	ed self-study outcomes/com	60 students		0	SCH	0	h	0	h						
	- S ca - T	calculate components of encryption.														
3	Contents: - Structure and function of local and wide area networks, - Protocols and IP addressing concepts (IPv4/IPv6), - Attacks on network security, - Risk analysis and building a secure infrastructure, - Security with AAA and firewalls, - Cryptography and virtual private networks (VPN) - Step-by-step configuration of a protected network environment.															
4		teaching:														
			ed teaching, pract	ical cou	rse											
5	Formal:	nion requireme Nor	ne													
	Content: None															
6		Forms of assessment:														
	Written examination, combination examination or oral examination															
7	Prerequisite for the award of credit points:															
	Module examination pass and course assessment															
	Application of the module (in the following study programmes)															
8	Electrical Engineering M.Eng.															
8					Importance of the grade for the final grade:											
9	Importan	ce of the grade														
	Importan accordin	ce of the grade														
	Importan accordin Module (ce of the grade	for the final grade:													

11	Other information:
	Literature will be announced at the beginning of the course. A script will be provided. Each student becomes a member of a Cisco class and has access to a simulation environment and extensive online curricula. Certificates can be issued for successful participation in Cisco final exams.
12	Language: German