Appendix B:

Module catalogue

for the study programme Mechanical Engineering (M.Sc.)

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	omation S	ystems 							AUS	
	itification iber:	Workload:	Credits:	Stud	y seme:		Frequency offer	of the	Duratio	on:
200)5	180 h	6	1st o	r 2nd s		Annual (Winter)		1 sem	
1	Course:	'	Planned group	sizes	Scop	ре	Actual co	ssroom	Self-stu	ıdy
	Lecture		60 students		2	weekly hours	30	h	60	h
	Seminar	lessons	30 students		1	weekly hours	15	h	30	h
	Exercise		20 students	20 students		weekly hours	0	h	0	h
			15 students		1	weekly hours	15	h	30	h
	Supervis	Supervised self-study 60 students Learning outcomes/competences:			0	weekly hours	0	h	0	h
	-	s solutions.	ical solutions, a	na to e\	/aluate	and crit	ically com	ipare the	eir own an	a othe
3			D		C I'		. 1. 2 (1)			
			Description and	-					•	
			nain (action p	-		•		•		
			monic balance.	-					-	
	Sensors	and actua	tors: Process	measu	rement	t techno	ology. Ele	ectric di	rive tech	nology
	convert	ers as actuato	ors. Digital com	munica	tion te	chnology	/ (bus sys	tems). Fo	ormal des	ign and
	descrip	tion methods,	especially Petr	ri nets						
	Introduc			111010.						
	synthes	ction to speci	al languages fo		ammin	g (PLC a	and Micro	controlle	er) and ha	ırdware
		ction to speci is (VHDL).	al languages fo		ammin	g (PLC a	and Micro	controlle	er) and ha	ndware
4		is (VHDL).		or progr		g (PLC a	and Micro	controlle	er) and ha	ardware
	Lecture	is (VHDL). teaching: , seminar less	ons and practic	or progr		g (PLC a	and Micro	controlle	er) and ha	nrdware
	Lecture Participa	is (VHDL). teaching: , seminar less tion requireme	ons and practionts:	or progr		g (PLC a	and Micro	controlle	er) and ha	ardware
	Lecture Participa Formal:	is (VHDL). teaching: , seminar less tion requireme None	ons and practionts:	or progr		g (PLC a	and Micro	controlle	er) and ha	ardware
5	Lecture Participa Formal: Content:	is (VHDL). teaching: , seminar less tion requireme None	ons and practionts:	or progr		g (PLC a	and Micro	controlle	er) and ha	ardware
5	Participal Formal: Content: Forms of	is (VHDL). teaching: , seminar less tion requireme	ons and practionts:	or progr		g (PLC a	and Micro	controlle	er) and ha	ardware
5	Participa Formal: Content: Forms of Written	is (VHDL). teaching: , seminar less tion requireme	ons and practionts:	cal cour		g (PLC a	and Micro	controlle	er) and ha	ardware
5	Lecture Participa Formal: Content: Forms of Written Prerequi	is (VHDL). teaching: , seminar less tion requireme	ons and practions: e or oral examina and of credit points	cal cour		g (PLC a	and Micro	controlle	er) and ha	ardware
5 6 7	Lecture Participa Formal: Content: Forms of Written Prerequi Module Applicati	is (VHDL). teaching: , seminar less tion requireme	ons and practionts: Dr oral examinal or oral examinal pass ule (in the followir	cal cour	se	mmes)		controlle	er) and ha	ardware
5 6 7	Lecture Participa Formal: Content: Forms of Written Prerequi Module Applicati BioMec	is (VHDL). teaching: , seminar less tion requireme None None assessment: examination osite for the awa examination on of the mode	ons and practionts: e or oral examinator of credit point pass ule (in the followings). and Mecha	cal cour	se	mmes)		controlle	er) and ha	ardware
5 6 7 8	Lecture Participa Formal: Content: Forms of Written Prerequi Module Applicati BioMec Importar	is (VHDL). teaching: , seminar less tion requireme	ons and practionts: Dr oral examinal or oral examinal pass ule (in the followir	cal cour	se	mmes)		controlle	er) and ha	ardware
5 6 7 8	Lecture Participa Formal: Content: Forms of Written Prerequi Module Applicati BioMec Importar accordi	is (VHDL). Iteaching: , seminar less tion requireme None None Seasessment: examination of the awa examination of the mode hatronics (M. Jace of the grading to MRPO	ons and practionts: e or oral examinator of credit point pass ule (in the followings). and Mechae	cal cour	se	mmes)		controlle	er) and ha	ardware
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5 6 7 8 9	Lecture Participa Formal: Content: Forms of Written Prerequi Module Applicati BioMec Importar accordi Module of Prof. Dr.	is (VHDL). teaching: , seminar less tion requireme	ons and practionts: Dr oral examinal and of credit point pass alle (in the following Sc.) and Mechalle for the final grant and grant sections.	cal cour	se	mmes)		controlle	er) and ha	ardware
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Fibre	e Compos	sites							FVW	
	tification	Workload:	Credits:	Stud	y semes		Frequency	of the	Durati	on:
numl 200		180 h	6	1st o	r 2nd s	sem.	offer Annual (Winter)		1 sem	l.
1	Course:		Planned group	sizes	Scop	pe	Actual continued time/class	ssroom	Self-stu	udy
	Lecture		60 students		2	weekly	30	h	60	h
	Seminar	lessons	30 students		1	weekly hours	15	h	30	h
	Exercise		20 students		0	weekly hours	0	h	0	h
	Practical	or seminar	15 students		1	weekly hours	15	h	30	h
		ed self-study outcomes/cor	60 students		0	weekly hours	0	h	0	h
	knowled		es and the spectal evaluation of local for fibre (f the po	ssible a	applicati	ons. Build	ing on th	nis, they le	earn the
	the use	nents. With the of fibre comp ses and select	e knowledge of osites in practic	the stre ce. Furtl	ngth ci nermor	riteria, it i e, they le	s now pos earn abou	sible for t selecte	them to e	evaluate acturing
3	the use process Contents Cha Strue Spe Mac Cla Stre Fati Spe App	nents. With the of fibre compess and select services and select services of fibre ecial properties cromechanics cromechanics sic laminate ength criteria gue behavious ecial features olications / Hy	e knowledge of osites in practic special test me of constructive I composites (files and application mechanical best mechanica	the streece. Furthethods ightweicher and ons of the havious pehavious axial loposite p	ngth creater more that are ght destinated and ght destinated and greater than the greater t	riteria, it i re, they le e importa sign a types) omposite idirectio ultilayer	s now pos earn abou ant for fibi e plastics nally reinf laminates	esible for t selecte re compo	them to e ed manufa osite mate	evaluate acturing erials.
4	the use process Contents Contents Structure Miccurrents Contents Contents Contents Structure Approximately a contents Approximately a content of the content of t	nents. With the of fibre comples and select services and select services aracteristics of a cucture of fibre ecial properties fromechanics aromechanics sic laminate ength criteria gue behavious cial features olications / Hyteaching:	e knowledge of osites in practic special test me of constructive I composites (files and application mechanical between theory for static, multipur of fibre composition of joining technologies and practic materials	ightwei bre and ons of the ehavious ehavious ehavious ehavious enavial lo posite p	ngth creater and that are ght deal matrix fibre cour of un ur of mads lastics and ma	riteria, it i re, they le e importa sign a types) omposite idirectio ultilayer	s now pos earn abou ant for fibi e plastics nally reinf laminates	esible for t selecte re compo	them to e ed manufa osite mate	evaluate acturing erials.
4	the use process Contents Cha Strue Spe Mac Cla Stre Fati Spe App Forms of Lecture Participa Formal:	nents. With the of fibre comples and select seracteristics of a racteristics of a racteristic from echanics of a racterial features of a racteristic features of a racteri	e knowledge of osites in practice as special test me of constructive I composites (files and applications mechanical between theory for static, multipur of fibre composite of joining technologies and practice ons and practice on the practice of the prac	ightwei bre and ons of the ehavious ehavious ehavious ehavious enavial lo posite p	ngth creater and that are ght deal matrix fibre cour of un ur of mads lastics and ma	riteria, it i re, they le e importa sign a types) omposite idirectio ultilayer	s now pos earn abou ant for fibi e plastics nally reinf laminates	esible for t selecte re compo	them to e ed manufa osite mate	evaluate acturing erials.
4 5	the use process Contents Cha Strue Spe Man Cla Stre Fati Spe App Forms of Lecture Participa Formal: Content: Forms of	nents. With the of fibre comples and select serial select serial properties cromechanics of the cromechani	e knowledge of osites in practice as special test me of constructive I composites (files and application as mechanical between theory for static, multipur of fibre composite of joining technologies and practice ons and practice on the practice of the practi	ightwei bre and ons of the ehavious ehavious ehavious enavial lo posite p nology a	ngth creater and that are ght deal matrix fibre cour of un ur of mads lastics and ma	riteria, it i re, they le e importa sign a types) omposite idirectio ultilayer	s now pos earn abou ant for fibi e plastics nally reinf laminates	esible for t selecte re compo	them to e ed manufa osite mate	evaluate acturing erials.
4 5 6	the use process Contents Contents Structure Mainum Clate Structure Appr Forms of Lecture Participa Forms of Written of Prerequise	nents. With the of fibre comples and select serial properties aracteristics of a cucture of fibre ecial properties fromechanics aromechanics aromech	e knowledge of osites in practice is special test me of constructive I composites (files and applications mechanical between theory for static, multipur of fibre composite of joining technologies and practice ints:	the streece. Further thods ightweithods ons of the chavious dehavious dehavi	ngth creater and that are ght deal matrix fibre cour of un ur of mads lastics and ma	riteria, it i re, they le e importa sign a types) omposite idirectio ultilayer	s now pos earn abou ant for fibi e plastics nally reinf laminates	esible for t selecte re compo	them to e ed manufa osite mate	evaluate acturing erials.
4 5 6	the use process Contents Contents Contents Structure Macure Fatti Special Speci	nents. With the of fibre comples and select seracteristics of a cucture of fibre ecial properties fromechanics cromechanics sic laminate ength criteria gue behavious ecial features oblications / Hyteaching: , seminar less tion requireme None assessment: exam, project site for the away examination on of the modules.	e knowledge of osites in practice is special test me of constructive I is composites (files and applications mechanical between theory of for static, multipart of fibre composite of joining technologies and practice ons and practice on the practice of the practice o	the streece. Furthethods ightweithods ightweithods on softe havious echavious echaviou	ngth creater more that are ght destinated and made and ma	riteria, it i re, they le e importa sign a types) omposite idirectio ultilayer	s now pos earn abou ant for fibi e plastics nally reinf laminates	esible for t selecte re compo	them to e ed manufa osite mate	evaluate acturing erials.
4 5 6 7	the use process Contents Contents Strue Spe Mic Mar Cla Stre Fati Spe App Forms of Lecture, Participa Formal: Content: Forms of Written of Written of Applicati Mechan Importan	nents. With the of fibre composes and select seracteristics of a cucture of fibre ecial properties fromechanics sic laminate ength criteria gue behavious ecial features oblications / Hyteaching: , seminar less tion requireme None assessment: exam, project site for the awa examination on of the modulical Engineer	e knowledge of osites in practice is special test me of constructive I is composites (files and applications mechanical between theory of for static, multipart of fibre composite of joining technologies and practice ons and practice on the practice of the practice o	ightwei bre and ons of the havious sehavious s	ngth creater more that are ght destinated and made and ma	riteria, it i re, they le e importa sign a types) omposite idirectio ultilayer	s now pos earn abou ant for fibi e plastics nally reinf laminates	esible for t selecte re compo	them to e ed manufa osite mate	evaluate acturing erials.

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

Finit	e Element	s 2							FE2	
lden num	tification ber:	Workload:	Credits:	Stud	y seme:	ster:	Frequence offer	cy of the	Durati	on:
200	3	180 h	6	1st o	r 2nd s	sem.	Annual (Summe	er)	1 sem	l.
1	Course:		Planned group	sizes	Scop	ре	time/cla teachin	contact assroom	Self-stu	udy
	Lecture		60 students		2	weekly hours	30	h	60	h
	Seminar I	essons	30 students		1	weekly hours		h	30	h
	Exercise		20 students		0	weekly hours	0	h	0	h
		or seminar	15 students		1	weekly hours		h	30	h
		ed self-study	60 students		0	weekly hours	0	h	0	h
2	Learning	outcomes/cor	npetences:							
	Students	s learn the the	eoretical and pr	actical	basics	of the fi	nite elem	ent meth	od for an	alysing
	non-line	ar, thermal ar	nd dynamic beh	aviour						
3	Contents	:								
			train hardening al analysis, fibre				-		-	ability,
4	Forms of	teaching:								
7			ons and practic	al cour	se					
5		ion requireme								
Ü	Formal:	None	9							
	Content:	Finite	e elements elast	ostatic	s, mac	hine dyn	amics			
6	Forms of	assessment:								
	Written									
			or oral examinat							
7	-	ite for the awa	rd of credit points							
7	Module	ite for the awa examination _l	rd of credit points pass	S:						
7	Module Application	ite for the awa examination on of the modu	rd of credit points pass ule (in the followin	S:	progra	mmes)				
8	Module Application Mechan	ite for the awa examination pon of the modu ical Engineer	rd of credit points pass ule (in the followin ing (M.Sc.)	s: g study	progra	mmes)				
	Module Application Mechan Important	ite for the awa examination pon of the modu ical Engineer ce of the grade	rd of credit points pass ule (in the followin	s: g study	progra	mmes)				
8	Module Application Mechan Important accordin	ite for the awa examination pon of the modu ical Engineer ce of the grade ng to MRPO	rd of credit points pass ule (in the followin ing (M.Sc.)	s: g study	progra	mmes)				
8	Module Application Mechan Important accordin Module c	examination point of the modulical Engineer ce of the grade ong to MRPO cordinator:	rd of credit points pass ule (in the followin ing (M.Sc.) e for the final grac	s: g study	progra	mmes)				
8 9 10	Module Application Mechan Important accordin Module of Prof. Dr.	examination point of the modulical Engineer ce of the gradeing to MRPO oordinator: -Ing. Paul Die	rd of credit points pass ule (in the followin ing (M.Sc.) e for the final grac	s: g study	progra	mmes)				
8	Module Application Mechan Important accordin Module of Prof. Dr. Other info	examination point of the modulical Engineer of the gradeing to MRPO oordinator: -Ing. Paul Die ormation:	rd of credit points pass ule (in the followin ing (M.Sc.) e for the final grac	s: g study de:			2			
8 9 10	Module Application Mechan Important accordin Module of Prof. Dr. Other info	examination pon of the modulical Engineer ce of the gradeng to MRPO coordinator: Ing. Paul Diecormation: e will be annotes	rd of credit points pass ule (in the followin ing (M.Sc.) e for the final grac	s: g study de:			Э,			

Colle	oquium								МКО	
ldent numl	tification ber:	Workload:	Credits:	Stud	y seme	ster:	offer	cy of the	Durati	on:
203	3	180 h	6	3rd	or 4th s	sem.	each se	emester		
1	Course:		Planned group	sizes	Scop	ре		contact assroom ng	Self-stu	udy
	Lecture		60 students		0	weekly hours	0	h	180	h
	Seminar I	essons	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	′ O	h	0	h
2	_	outcomes/co oquium com	mpetences: plements the m	aster th	nesis a	·	be asses	ssed indep	endently	v. It serves
			r the candidate of the master t				_	•	-	
		•	non-subject-re							
	practice Contents									
3			nesis according	to the	topic					
	- Disp		ne procedure in			on of the	thesis a	ind the qu	estions th	nat arose
4	Forms of	teaching:								
			the master thes	sis						
5		tion requireme								
	Formal:	None	tment of the ma	etor the	ocio					
6	Content:	assessment:	unencor the ma	15161 1116	5313					
O		mination								
7	Prerequis	site for the awa	ard of credit point	S:						
8	Application	on of the mod	ule (in the followin	ng study	progra	mmes)				
	Electrica	al Engineerin	g (M.Eng.), Rese	earch M	laster [Data Scie	ence, Me	echanical (Engineeri	ng
			tion and Simula		.Sc.)					
9	accordir	ng to MRPO	e for the final grad	de:						
10		coordinator:								
44	N.N. Other info	ormation								
11			ounced at the b	eginnir	na of th	A COURS	ے			
		C MIII DE GITT	our look at tile D	,~yıı ıı ili	19 01 11	ic cours	√ .			
12	Languag	e:								

Man	agement	Skills							MMK	
Ident numl	tification ber:	Workload:	Credits:	Stud	y seme:	ster:	Frequence offer	cy of the	Duratio	on:
200		180 h	6	1st o	r 2nd s	sem.	Annual (Summe	er)	1 sem	
1	Course:	<u>'</u>	Planned group	sizes	Scop	ре		contact assroom	Self-stu	ıdy
	Lecture		60 students		2	weekly hours		h	60	h
	Seminar	lessons	30 students		2	weekly hours	30	h	60	h
	Exercise		20 students		0	weekly hours	0	h	0	h
		or seminar	15 students		0	weekly hours	0	h	0	h
2		ed self-study outcomes/cor	60 students		0	weekly hours	0	h	0	h
	and soo	cial mission. Totives. They cannot be the city of the cannot be the case of th	understand the hey have lear lear lear lear lear lear lear lea	ned to eir own l s and th	analys oehavi nemse	e entrep our/perd lves, to v	oreneuria ception n work suc	nl measure nore realistices	es from d stically. Th in a team	lifferent ney can and to
3	Contents									
	manage occupa econom develop tracking manage	ement, social, tional safety, nic activities, oment and p g and contro	planning, m professional a environmental code of Ga roduction strated billing, balance et managemen	and me protect erman tegies, d scor	thodol ion, er refere projec e card	logical c nergy an ences, in et manaç d, techr	competer od resour ntercultu gement, nology e	nce, generce efficient ral mana self-mane excellence	eral legal ency, sust agement, agement, e level, o	issues, ainable global target change
4		teaching: s, case studie	s, exercises							
5		tion requireme None	nts:							
6	Forms of	assessment:	combination ex	aminati	on or o	oral exar	nination			
7	Prerequi		rd of credit point							
8	Applicat Electric	ion of the modu	oass lle (in the followir g (M.Eng.), Mec			•	1.Sc.) and	d Optimisa	ation and	
	Importar		e for the final gra	de:						
9	i accordi									
9 10	Module (coordinator:	üsgen							
	Module of Prof. Dr. Other inf	coordinator: -Ing. Bruno H formation:	üsgen ounced at the b	eginnin	g of th	e course) .			

Mas	ter Thesis								M.A.	
ldent numl	tification ber:	Workload:	Credits:	Stud	y semes	ster:	Frequeno offer	cy of the	Duratio	on:
203	4	720 h	24	3rd	or 4th s	em.	each se	mester	20 we	eks
1	Course:		Planned group	sizes	Scop	е		contact assroom	Self-stu	ıdy
	Lecture		60 students		0	weekly hours	_	h	720	h
	Seminar	lessons	30 students		0	weekly hours		h	0	h
	Exercise		20 students		0	weekly hours	0	h	0	h
		or seminar	15 students		0	weekly hours	0	h	0	h
2		ed self-study outcomes/cor	60 students		0	weekly hours	0	h	0	h
	practice subject-	e-oriented tas	sis, each candi sk from his/her s ails and in the c methods.	subject	area v	vithin a s	specified	d period o	f time, bo	th in its
3	study pr by an er	ster thesis is rogramme wit mpirical inves	an independen h a description tigation or by co on of these forn	and ex oncept	planati ual or d	on of its	solution	. It can als	o be dete	rmined
4		teaching:	with faculty tuto	rina						
5		tion requireme	nts:		studer	nt's spec	cial subje	ect area		
6	Forms of	assessment:								
7	Prerequis	site for the awa	rd of credit points	S:						
8	Electrica (M.Sc.) a	al Engineering and Optimisat	ule (in the followin g (M.Eng.), Rese tion and Simulat	arch M tion (M.	aster D		ence, Me	echanical (Engineeri	ng
9	accordi	ng to MRPO	e for the final grac	de:						
10	N.N.	coordinator:								
11		ormation: re will be anno	ounced at the b	oginnir	of th	0.001100				
		o wiii bo arii k	builded at the b	eanni	ig oi ii i	e Course	7.			

	ti-Body Si	mulation							MKS	
	tification ber:	Workload:	Credits:	Stud	y seme	ster:	Frequenc offer	y of the	Duratio	on:
201		180 h	6	1st o	r 2nd s	sem.	Annual (Summer	·)	1 sem.	
1	Course:		Planned group	sizes	Scop)e	Actual c time/cla teaching	ssroom	Self-stu	dy
	Lecture		60 students		2	weekly hours		h	60	h
	Seminar	lessons	30 students		0	weekly	0	h	0	h
	Exercise	,	20 students	20 students		weekly hours	15	h	30	h
		l or seminar	15 students		1	weekly hours	15	h	30	h
	Supervis	sed self-study	60 students		0	weekly hours	0	h	0	h
3	- Conc - Coord - Coerd - Exam - Nume - Equat - Lagra - Force	anisms (definents in plane before the system condition ples for the sterical solution inge multiplier and control et and contr	s, generalised c s andardised des of the kinemation of dynamics u s	coordina cription	n of me		ns			
	- Euler - Exam	al systems parameters ples for the st	andardised des	cription	n of sp	atial syst	ems			
4		r lessons with ation requireme None		oractica	al train	ing on th	e compu	ter		
4 5	Formal:		`							
5	Formal: Content: Forms of	None fassessment:	combination ex	aminat	ion, pe	rforman	ce examir	nation or	oral exam	ninatior
5	Formal: Content: Forms of Written Prerequi Module	None f assessment: examination, site for the awa examination	combination ex rd of credit points pass	S:	-		ce examir	nation or	oral exam	nination
5 6 7	Formal: Content: Forms of Written Prerequi Module Applicat	None f assessment: examination, site for the awa examination ion of the moduling from the moduling fro	combination ex	s: g study	progra	mmes)				
	Formal: Content: Forms of Written Prerequi Module Applicat BioMec (M.Sc.)	None f assessment: examination, site for the awa examination ion of the modulatronics (M.S.	combination ex rd of credit points pass ule (in the followin	s: g study I Engin	progra	mmes)				

11	Other information:
	Literature will be announced at the beginning of the course.
	Literature:
	Rill, G.:.: Schaeffer, T.: "Grundlagen und Methodik der Mehrkörpersimulation", Vieweg +Teubner Verlag, ISBN 978-3-8348-0888-2,2010.
	Haug, E.J.H: "Computer-Aided Kinematics and Dynamics of Mechanical Systems", Volume 1. Basic Methods, Allyn And Bacon, ISBN 0-205-11669-8 (v.1) 1989.
12	Language:
	German

Idon	tiphysics S	Simulation							MPH	
num	tification	Workload:	Credits:	Study	y semes		Frequency offer	of the	Durati	on:
204		180 h	6	1st o	r 2nd s	em.	Annual (Winter)		1 sem	
1	Course:		Planned group	sizes	Scop	е	Actual contact time/classroom teaching		Self-stu	ıdy
	Lecture		60 students		2	weekly hours	30	h	60	h
	Seminar	lessons	30 students	30 students		weekly hours	0	h	0	h
	Exercise		20 students		2	weekly hours	30	h	60	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
	equatio method differen	ns and ider ological prod tial equation	nsfer, electrody tify the coupli cedure for the s and can use ns in a target-or	ng terr modelli e free	ns in ng and and c	multi-ph d numer commerc	nysics pro rical simu	oblems. lation of	They kn	ow the I partia
3	- Ti st - N - B b	efinition of m reatment of ty ructure intera umerical solu est practice i oundary con	ultiphysics via c pical couplings action, etc.) and ation methods (e n modelling (CA ditions, develop simulation using	s (e.g. el their ap especial D for si ment of	ectro-foplication oplication lly FEM mulation solution	thermal \ ons in pr) on, appro on strate	WW, fluid ractice opriate dis gies, etc.)	-thermal scretisati	on, doma	
		ppiication ex								
4		teaching: , seminar less	·	ses on t	:he cor	nputer				
4 5	Lecture Participa Formal:	, seminar less tion requireme Non	sons with exerci	ses on t	he cor	nputer				
	Lecture Participa Formal: Content: Forms of Project	, seminar less tion requirement Non Non assessment:	sons with exercing ents: e		he cor	nputer				
5	Participa Formal: Content: Forms of Project Prerequi Module	, seminar less tion requirement Non Non assessment: work site for the away examination	cons with exercisents: e e ard of credit point pass	S:						
5 6 7 8	Lecture Participa Formal: Content: Forms of Project Prerequi Module Applicat Mechar	, seminar less tion requirement Non Non assessment: work site for the away examination on of the moduical Enginee	sons with exercisents: e e ard of credit point pass ule (in the followin ring (M.Sc.) and	s: ng study Optimis	prograr	mmes)	ulation (M	.Sc.)		
5 6 7 8	Lecture Participa Formal: Content: Forms of Project Prerequi Module Applicat Mechar Importar accordi	, seminar less tion requirement Non Non assessment: work site for the away examination of the modulical Engineer of the grading to MRPO	sons with exercisents: e e ard of credit point pass ule (in the followin	s: ng study Optimis	prograr	mmes)	ulation (M	.Sc.)		
5	Lecture Participa Formal: Content: Forms of Project Prerequi Module Applicat Mechar Importar accordi Module Prof. Dr. Other inf	, seminar less tion requirement Non Non Non assessment: work site for the away examination on of the modulical Engineer of the grading to MRPO coordinator: rer. nat. Lars formation:	eons with exercisents: e e ard of credit point pass ule (in the following (M.Sc.) and e for the final grad	s: ng study Optimis de:	prograr sation a	mmes) and Simu		.Sc.)		

	nputationa	al Fluid Dynan	nics 2						CFD2	
lden num	tification ber:	Workload:	Credits:		y semes		Frequency offer	of the	Duratio	on:
200	8	180 h	6	1st o	r 2nd s	em.	Annual (Winter)		1 sem	
1	Course:	!	Planned group s	izes	Scop	е	Actual co	sroom	Self-stu	ıdy
	Lecture		60 students		2	weekly hours		h	60	h
	Seminar	lessons	30 students		1	weekly hours	15	h	30	h
	Exercise		20 students		0	weekly hours	0	h	0	h
	Practical or seminar		15 students		1	weekly hours	15	h	30	h
	Supervised self-study		60 students mpetences:		0	weekly hours	0	h	0	h
		research topi	eady and turbule cs in the field of (Jana	. norprot	a lo rosult	S. Stade	are rai	ai vvit
3	Expansi method, turbulen commer Impleme	on of the theo extension on the extension of extension of the control of the cont	oretical foundation of the Navier Some control o	tokes mmerc s STA	equat cial too R CCN	ions by ols: Sim 1+ or AN	the ene ulation of NSYS CFX	rgy equ turbule Softwa	ation, ba nt flows re develc	sics of with a
	Forms of									
4	Lactura	teaching:	one and practica	al cour	S-0					•
4 5		teaching:	ons and practica	al cour	se					•
		teaching: seminar less tion requireme	nts:							•
	Participa Formal: Content: Forms of	teaching: seminar less tion requireme None Cont assessment:	nts:							•
5	Participa Formal: Content: Forms of Written of Prerequisi Module	teaching: seminar less tion requireme None Cont assessment: examination osite for the awa examination	nts: ent of the lecture or project work rd of credit points: pass	e CFD	1 (1187)				•
5	Participa Formal: Content: Forms of Written of Prerequisi Module Applicati	teaching: seminar less tion requireme None Cont assessment: examination osite for the awa examination	nts: ent of the lecture or project work rd of credit points: pass ule (in the following	e CFD	1 (1187)				•
5 6 7	Participa Formal: Content: Forms of Written of Prerequis Module Applicati Mechan Importan	teaching: seminar less tion requireme None Cont assessment: examination osite for the awa examination on of the modulical Engineer	nts: ent of the lecture or project work rd of credit points: pass ule (in the following	e CFD	1 (1187)				•
5 6 7 8	Participa Formal: Content: Forms of Written of Prerequisi Module Applicati Mechan Importan accordii Module of	teaching: a seminar less tion requireme	ents: ent of the lecture or project work rd of credit points: pass ule (in the following ing (M.Sc.) e for the final grade	e CFD	1 (1187)				•
5 6 7 8 9	Participa Formal: Content: Forms of Written of Prerequisi Module Applicati Mechani Importan accordii Module of Prof. Dr. Other inf	teaching: seminar less tion requireme None Cont assessment: examination of the awa examination on of the modulical Engineer ce of the grade ng to MRPO coordinator: rer. nat. Mart ormation:	ents: ent of the lecture or project work rd of credit points: pass ule (in the following ing (M.Sc.) e for the final grade	e CFD	1 (1187) mmes)	Э.			•

Proj	ect Modul	e 1							MPR1		
	Identification Worklo		Credits:	Stud	y semes	ster:	Frequency of the offer		Duratio	Duration:	
2007		180 h	6	1st c	1st or 2nd sem.		Annual (Summer)		1 sem.	1 sem.	
1	Course:		Planned group sizes		Scope		Actual contact time/classroom teaching		Self-study		
	Lecture		60 students		0	weekly hours	0	h	0	h	
	Seminar lessons		30 students		4	weekly hours		h	120	h	
	Exercise		20 students		0	weekly hours	0	h	0	h	
		or seminar	15 students		0	weekly hours		h	0	h	
	Supervised self-study		60 students		0	weekly hours	0	h	0	h	
2	The stud	Learning outcomes/competences: The students are able to work on scientific problems from the field of mechan within the framework of a project.							nical engir	neering	
3	Familiari	Contents: Familiarisation with current research and coumentation and presentation of results				nent top	ics, proje	ct manag	jement,		
4	Forms of	teaching: lessons	ileseritation or i	esuits.							
5	Participa Formal:	tion requireme None None)								
6		assessment:									
7	Module	examination									
8	Mechan	ical Engineer			progran	mmes)					
9	accordi	ng to MRPO	e for the final grad	de:							
10	Prof. Dr.	coordinator: rer. nat. Marti	in Petry								
11			ounced at the b	eginnir	ng of th	e course) .				
12	German										

Proj	ect Modul	e 2							MPR2		
	Identification Workloa number:				y semes		Frequency of the offer		Duratio	Duration:	
2002		180 h	6	1st c	1st or 2nd sem.		Annual (Winter)		1 sem.	1 sem.	
1	Course:		Planned group sizes		Scope		Actual contact time/classroom teaching		Self-study		
	Lecture		60 students		0	weekly hours	0	h	0	h	
	Seminar lessons		30 students		4	weekly hours	60	h	120	h	
	Exercise		20 students		0	weekly hours	0	h	0	h	
		or seminar	15 students		0	weekly hours		h	0	h	
	Supervised self-study		60 students		0	weekly hours	0	h	0	h	
2	The stud	Learning outcomes/competences: The students are able to work on scientific problems from the field of mechan within the framework of a project.							nical engir	neerinç	
3		sation with cu	urrent research		velopn	nent top	ics, projed	ct manag	jement,		
4	Forms of	teaching: lessons	resentation of I	resuits.							
5	Formal:	tion requireme None None)								
6	Content: Forms of Project v	assessment:	•								
7	Module	examination									
8	Mechan	ical Engineer			progran	mmes)					
9	accordi	ng to MRPO	e for the final grad	de:							
10	Prof. Dr.	coordinator: rer. nat. Marti	in Petry								
11			ounced at the b	eginnir	ng of th	e course) .				
12	German										

I - I	tems Simu			Ot l		-4	<u></u>		SYS	
	itification ber:	Workload:	Credits:	Study	y seme		Frequency of the offer		Duration:	
2009		180 h	6	1st o	r 2nd s	sem.	Annual (Summer)		1 sem.	
1	Course:		Planned group sizes		Scop	ре	Actual contact time/classroom teaching		Self-stud	dy
	Lecture		60 students		2	weekly hours		h	60	h
	Seminar lessons		30 students	30 students		weekly hours	30	h	60	h
	Exercise	;	20 students		0	weekly hours	0	h	0	h
	Practica	l or seminar	15 students	15 students		weekly hours	0	h	0	h
	Supervised self-study		60 students		0	weekly hours	0	h	0	h
3	apply these to new problems. They know how to prepare the models create them on common system simulators, such as Matlab/Simulink. They can also experiments systematically and carry them out in a targeted manner. Furtionable to assess the opportunities, limits and problems of a numerical simulation analyse the results professionally. Contents: Introduction (definitions, types of simulation, process models, goals) Modelling methods (balance-space based, formalisms for mech./election disciplinary techniques, experimental modelling) Model preparation for simulation (transfer to state representation, blooking arisation, treatment of algebraic loops and structural singularities,							can also er. Furthe cal simul goals) ch./elect	o plan sime ermore, th ation as v	ulatio ey ar well a
	- N	Model prepara	eatment of algel	oraic lo	ops ar	nd structi	ural singul	arities, d	escriptor f	
	- N lin - S - S	flodel prepara nearisation, tre imulation prod imulation exp pplication exa	eatment of algel cedures (classifi eriments (planni	oraic lo cation,	ops ar select	nd structi	ural singul ria, num. p	arities, d roblems	escriptor f	
1	- M lin - S - S - A	flodel prepara nearisation, tre imulation prod imulation exp	eatment of algeb cedures (classifi eriments (planni amples	oraic lo cation,	ops ar select	nd structi	ural singul ria, num. p	arities, d roblems	escriptor f	
	- M lin - S - S - A Forms of Lecture	Model prepara nearisation, tre imulation prod imulation exp pplication exa f teaching: es and computation requireme None	eatment of algeb cedures (classifi eriments (planni amples eer seminars nts:	oraic lo cation,	ops ar select	nd structi	ural singul ria, num. p	arities, d roblems	escriptor f	
1	- M lir - S - S - A Forms of Lecture Participa Formal: Content: Forms of Term pa	Model prepara nearisation, tre imulation prod imulation exp pplication exa f teaching: es and computation requireme None None f assessment: aper, written e	eatment of algebreedures (classificeriments (planniumples er seminars ets: e	oraic lo cation, ng, imp	ops ar select blemer	nd structi ion crite itation ar	ural singul ria, num. p nd follow-	arities, d roblems up)	escriptor f	form)
5	- M lir - S - S - A Forms of Lecture Participal Formal: Content: Forms of Term pay work, or Prerequi Module	Model prepara nearisation, tre imulation procimulation expension examination expension examination requirements assessment: aper, written examination examination examination examination examination	eatment of algebratements (classificedures (classificedures) (planning amples) er seminars	nbination durings:	ops ar select blemer on exa g the c	nd structi ion crite itation ar mination	ural singul ria, num. p nd follow-	arities, d roblems up)	escriptor f	form)
5	- M lir - S - S - A Forms of Lecture Participa Formal: Content: Forms of Term pa work, or Prerequi Module Applicat	flodel prepara nearisation, tre imulation procimulation expenses and computation requireme None assessment: aper, written exper, written examination item modulion of the modulion.	eatment of algebredures (classificeriments (planning) amples eer seminars ets: ecs examination, con n or examination rd of credit points	nbination durings:	ops ar select olemen	mination course	ural singul ria, num. p nd follow-	arities, d roblems up)	escriptor f	projec
3	- M lir - S - S - A Forms of Lecture Participal Formal: Content: Forms of Term payork, or Prerequi Module Applicat BioMed (M.Sc.)	Model prepara nearisation, tre imulation procimulation expension examination examination requireme None assessment: aper, written examination site for the awa examination ion of the model.	eatment of algebratements (classificedures (classificedures) (planning amples) er seminars er	nbination durings: g study I Engine	ops ar select olemen	mination course	ural singul ria, num. p nd follow-	arities, d roblems up)	escriptor f	projec
5	- M lir - S - S - A Forms of Lecture Participa Formal: Content: Forms of Term pa work, or Prerequi Module Applicat BioMec (M.Sc.) Importar accordi	Model prepara nearisation, tre imulation procimulation expension examination examination requirements assessment: aper, written examination site for the aware examination ion of the modulation of the grade control of t	eatment of algebratments (classificedures (classificedures) (classificedures) (planniamples) er seminars er semina	nbination durings: g study I Engine	ops ar select olemen	mination course	ural singul ria, num. p nd follow-	arities, d roblems up)	escriptor f	projec

12 Language:
German

Tribo	ology								TRI		
Ident	tification ber:	Workload:	Credits:	Study	y semes		Frequency of the offer		Duratio	Duration:	
200		180 h	6	1st o	1st or 2nd sem.		Annual (Winter)		1 sem.		
1	Course:	l.	Planned group	sizes	Scop	е	Actual co		Self-stu	dy	
	Lecture		60 students		2	weekly hours	30	h	60	h	
	Seminar I	lessons	30 students		1	weekly hours	15	h	30	h	
	Exercise		20 students		0	weekly hours	0	h	0	h	
	Practical	or seminar	15 students		1	weekly hours	15	h	30	h	
	Supervise	ed self-study	60 students		0	weekly hours	0	h	0	h	
	of the field of knowledge. They are able to analyse and evaluate tribosystems. From the determination of influencing factors, it is possible for the students to develop suitable measures for system optimisation with regard to friction and wear. They will be able to independently work out case studies and scientifically interpret and explain them in the context of tribology.								suitable		
	context	of tribology.	out case studi	es and	scien	tifically i		-			
3	Context Contents Friction: moveme Wear an Lubricat Measure	of tribology. Types and ment influences and tear: Types tion: Classificatement of frictions.	echanisms of fr	riction. I tions of istic val	Dry and wear. I lues, lu	d media Damage bricatior	friction. M mechanish	aterial, some which we have a second control of the	urface an	in the	
3	Context Contents Friction: moveme Wear an Lubricat Measure tribologi Forms of	of tribology. Types and ment influences and tear: Types ion: Classification: Classification of friction of the cal systems.	echanisms of fr s. and manifestat ation, character on, wear and lu	riction. I tions of istic val bricant	Dry and wear. I lues, lu param	d media Damage bricatior	friction. M mechanish	aterial, some which we have a second control of the	urface an	in the	
	context Contents Friction: moveme Wear an Lubricat Measure tribologi Forms of Lecture,	of tribology. Types and ment influences and tear: Types ion: Classification: Classification of friction of the cal systems.	echanisms of fr s. and manifestat ation, character on, wear and lu ons and practic nts:	riction. I tions of istic val bricant	Dry and wear. I lues, lu param	d media Damage bricatior	friction. M mechanish	aterial, some which we have a second control of the	urface an	in the	
4	context Contents Friction: moveme Wear an Lubricat Measure tribologi Forms of Lecture, Participat Formal: Content: Forms of Term pa	of tribology. Types and ment influences and tear: Types and tear and	echanisms of fr s. and manifestat ation, character on, wear and lu ons and practic nts:	tions of tions of istic val bricant cal cour	Dry and wear. I lues, lu param	d media Damage brication eters. Se	friction. M mechanish methods elected ex	aterial, some sms. Wears.	urface an	d sation.	
4 5	Context Contents Friction: moveme Wear an Lubricat Measure tribologi Forms of Lecture, Participat Formal: Content: Forms of Term pa examina Prerequis Module	of tribology. Types and ment influences and tear: Types and tear of friction call systems. Iteaching: Itea	echanisms of freelings. and manifestate ation, character on, wear and lute ons and practice ons. examination, corrected of credit points pass and course	tions of istic value bricant cour mbinations:	Dry and wear. I lues, lu param se	d media Damage brication eters. Se	friction. M mechanish methods elected ex	aterial, some sms. Wears.	urface an	d sation.	
4 5 6	context Contents Friction: moveme Wear an Lubricat Measure tribologi Forms of Lecture, Participat Formal: Content: Forms of Term pa examina Prerequis Module Applicati Mechan	of tribology. Types and ment influences and tear: Types and tear and t	echanisms of from the control of credit points pass and course pass and course le (in the following (M.Sc.)	riction. I tions of istic val bricant cal cour mbinations: e asses g study	Dry and wear. I lues, lu param se	d media Damage brication eters. Se	friction. M mechanish methods elected ex	aterial, some sms. Wears.	urface an	d sation.	
4 5 6	context Contents Friction: moveme Wear an Lubricat Measure tribologi Forms of Lecture, Participal Formal: Content: Forms of Term pa examina Prerequis Module Applicati Mechan Importan accordin	of tribology. Types and ment influences and tear: Types and tear and	echanisms of from the control of credit points and course and cour	riction. I tions of istic val bricant cal cour mbinations: e asses g study	Dry and wear. I lues, lu param se	d media Damage brication eters. Se	friction. M mechanish methods elected ex	aterial, some sms. Wears.	urface an	d sation.	
4 5 6 7 8	Context Contents Friction: moveme Wear an Lubricat Measure tribologi Forms of Lecture, Participat Formal: Content: Forms of Term pa examina Prerequis Module Applicati Mechan Importan accordir Module of	Types and ment influences and tear: Types and teaching: Iteration seminar less tion requirement of friction assessment: Iteration assessment: Iteration assessment: Iteration and the modulical Engineer and to MRPO accordinator:	echanisms of from the chanisms of from the chanisms of from the change of the change o	riction. I tions of istic val bricant cal cour mbinations: e asses g study	Dry and wear. I lues, lu param se	d media Damage brication eters. Se	friction. M mechanish methods elected ex	aterial, some sms. Wears.	urface an	d sation.	
4 5 6 7 8 9	context Contents Friction: moveme Wear an Lubricat Measure tribologi Forms of Lecture, Participat Formal: Content: Forms of Term pa examinat Prerequis Module Applicati Mechan Importan accordir Module of Prof. Dr. Other infe	Types and ment influences and tear: Types and tearing: teaching: teaching: teaching: teaching: teaching: teaching: teaching: None assessment: teaching: None assessment: teaching: tearing tear written eation site for the awa examination on of the modulical Engineer ce of the gradeing to MRPO coordinator: lng. Klaus Difformation:	echanisms of from the chanisms of from the chanisms of from the change of the change o	riction. I tions of istic val bricant cal cour mbination s: e asses g study	Dry and wear. I lues, lu param se	d media Damage brication eters. Se	friction. M mechanis n methods elected ex	aterial, some sms. Wears.	urface an	d sation.	

Elec	tive Modu	le								WM	
ldent numb	ification per:	Workload:		Credits:	Study	semes	ter:	Frequency of the offer		Duration:	
9028	3	180 h		6 1st s		em.		Annual (Summer)		1 sem.	
1	Course:		Planned group sizes		sizes	Scope		Actual contact time/classroom teaching		Self-study	
	Lecture		60 students 30 students				weekly hours	,	h		h
	Seminar I	essons					weekly hours	,	h		h
	Exercise		20) students			weekly hours	,	h		h
		or seminar	15	students		0	weekly hours	0	h	0	h
		ed self-study		60 students			weekly hours	′	h		h
2	Learning	outcomes/co	mpe	tences:							
3	Contents	:									
4	Forms of	teaching:									
5	Participat	tion requireme	ents:								
	Formal:										
	Content:										
6		assessment:									
7	Prerequisite for the award of credit points:										
8		on of the mod ical Enginee			g study (orogran	nmes)				
9	Importan	ce of the grad	e for	the final grac	le:						
10		coordinator:									
11	Prof. Dr. Other info	rer. nat. Mart ormation:	in P	etry							
	001 1111										
12	Languag										
	German										