## Appendix B: Module catalogue

## for the study programme Applied Mathematics (B.Sc.)

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Ana	alysis								ANA	
	itification ber:	Workload:	Credits:	Stud	y sem	ester:	Frequen	cy of the	Durati	on:
100	3	450 h	15	1st	1st sem.			-)	2 sem	٦.
1	Course:		Planned grou	p sizes	Scop	oe .	Actual time / classro teachir		Self-stu	ıdy
	Lecture		60 students		8	SCH	120	h	180	h
	Sem. les	ssons	30 students		0	SCH	0	h	0	h
	Exercise	9	20 students		4	SCH	60	h	90	h
	Practica seminar		15 students		0	SCH	0	h	0	h
	Supervi study	sed self-	60 students		0	SCH	0	h	0	h
3	The students know the basic concepts of calculus. They can name and represent these terms. They can apply the knowledge to problems, calculate and state solutions. They can independently identify, formulate, and analyse problems and present solutions.  Contents:									
	•	Real funct integrabilit Functions continuity, Function s series Basics of v	ences and seri ions of one va iy of several v differentiabili equences and ector analysis d curve integr	riable, variabl ity and series s, oper	their es (s d integ s, inte	contir scalar grabilit rchanç	nuity, dif and ve y (doubl	ferential ctor fiel e and tr	ds) and	d their grals)
4		f teaching: e with exer	cises							
5		ation require								
	Formal:	Non								
	Content		lules: 1 Mathematic	al Fou	ındəti	onci				
6	Forms o	f assessmei	1 Mathematic	.ai rou	iiiuati	ons,				
0	Term p	aper, writt	en examinatio	•				, project	work, o	ral
7			award of credit			i the co	Juise			
	Module	examinati				/ proge	ammac)			
8	Applied	l Mathema	tics (B.Sc.)			y progra	ammes)			
9		nce of the g ing to BRPC	rade for the fin	al grad	le:					
10		coordinator:								
11		r. rer. nat. formation:	Jörg Horst							
1.7	other in	UNITED A FIOR!								
11	Literati		announced at	the he	aginn	ina of t	he cour	se .		

Language:
German

Bac	chelor Ti	hesis							ВА	
T al a se	. L: C: L:	10/ a   -   a   -	C d:t	I C44		1	<b>F</b>	£ bla .	Dometic	
	ntification ber:	Workload:	Credits:	Stud	y sem	ester:	rrequer offer	icy of the	Duratio	on:
129	94	360 h	12	7th	sem.		each s	emester	12 we	eks
1	Course:		Planned grou	p sizes	Scor	ре	time /		Self-stu	dy
							classro teachi			
	Lecture		60 students		0	SCH	0	h	0	h
	Sem. les	ssons	30 students		0	SCH	0	h	0	h
	Exercise		20 students		0	SCH	0	h	0	h
	Practica		15 students		0	SCH	0	h	0	h
	seminar Supervis		60 students		0	SCH	0	h	360	h
	study	sed sell	oo staaciits		"	Jen	ľ	''	300	''
2	Learning	g outcomes/o	competences:			•	•	•	•	
			thesis, the o							
	practice-oriented task from his/her special subject area within a specified per of time, both in terms of subject-related details as well as in terms of work									
	independently on interdisciplinary contexts according to scientific methods.									
3	Content	S:								
,			is is usually a	n inde	pende	ent inv	estigati	on with a	mathem	natical-
			natical-busin							
			nd a detaile							
	profess	ionally suit	able cases, i	t can a	also b	e a w	ritten te	erm pape	r with su	ıbject-
	literary	content.								
	F	£ +  - :								
4	Forms o	f teaching:								
5	Participa	ation require	ments:							
5	Formal:		Section 27 RF	PO-BA						
	Content									
6		f assessmen	nt:							
7	Prerequ	isite for the a	award of credit	points	:					
8			odule (in the fo	ollowing	study	/ progr	ammes)			
_		Mathemat								
9	-	_	rade for the fin	ai grad	ie:					
10		ing to BRPC coordinator:	)							
10			nhard Bachma	ann						
11		formation:	mara Daciille	a1111						
11		. 3								
12	Languag	je:								
	Germar									

Dat	abases									DB	
	ntification ber:	Workload	: Credits	:	Stud	y sem	ester:	Frequen	cy of the	Duration	on:
129		150 h	5		4th or 6th sem.					1 sem	1.
1	Course:		Planned gr	oup :	sizes	Scop	e	Actual time / classro teachir		Self-stu	ıdy
	Lecture		60 student	:S		0	SCH	0	h	0	h
	Sem. les	ssons	30 student	:S		4	SCH	60	h	90	h
	Exercise	9	20 student	:S		0	SCH	0	h	0	h
	Practica seminar		15 student	:S		0	SCH	0	h	0	h
	study	sed self-	60 student			0	SCH	0	h	0	h
2	The stu a posit	udents kno ion to mod nship diagr ge.	/competence w the esser lel application am and imp	ntial ons,	to pr	esen	tthese	e in the f	orm of a	n entity	-
	•	Database Relational integrity Database Entity rela Programm		ation rmal cept dels	nal da I forr tual a and terns	ataba ns, lo nd log diagr hip: I	ses gical d gical d ams ntrodu	latabase esign uction to	descript	abase lar	nguage
4	Forms o	f teaching:	l practical p	roar	amm	ina c	OUISE				
5		ation requir		rogi	ammin	ing c	ourse				
•	Formal: Content	: Mo	dules: 98 Principles	of C	Comp	uter	Scienc	ce			
6	Term p		ten examina amination,								
7	Prerequ		award of cre	dit p	oints						
8	Applicat	ion of the n	nodule (in the		owing	study	/ progr	ammes)			
9	Importa	nce of the	grade for the O or SPO if	final	_		tive su	ıbiect			
10	Module	coordinator	:	'5'	2300			,			
11	Dr. math. Elke Koppenrade  Other information:  Literature will be announced at the beginning of the course.  Teaching content is summarised in a script accompanying the lecture.										

Language:
German

Diff	erentia	l Eau	ations							DGL	
Iden num	tification	Work	load:	Credits:	Stud	y sem	ester:	Frequence offer	y of the	Duratio	n:
104	~ ~	360	h	12	3rd	sem.		Annual		2 sem	_
								(Winter)			
1	Course:		F	Planned group	sizes	Scop	e	Actual c	ontact	Self-stud	dy
	classroom										
								teaching	1		
	Lecture			0 students		0	SCH	0	h	0	h
	Sem. les	ssons	3	30 students		8	SCH	120	h	240	h
	Exercise	<u> </u>	2	20 students		0	SCH	0	h	0	h
	Practica	lor		.5 students		0	SCH	0	h	0	h
	seminar										
	Supervi	sed se	lf-   6	0 students		0	SCH	0	h	0	h
2	study Learning	outco	mes/co	mpetences:				1			
	Students possess theoretical and practical competences in dealing with analytically solvable ordinary differential equations and systems of differential equations. They are able to make qualitative assessments about existence and										
										existen	ce and
	uniqueness propositions and the correctness of the assignment.										
3	Content	s:									
5		-	ods for	solving expli	cit an	d imp	licit fir	st-order	ordinar	differer	ntial
		equat	ions			•			•	•	
				point theore							
				encetheore				1.61			
				linear differents	ential	equa	tions a	and first o	rdersy	stems wi	ith
4	Forms o			IIICIEIILS							
	Sem. le		-								
5	Participa	ation re	equirem	ents:							
	Formal:										
	Content	:	Modul	es: Analysis							
				inear Algeb	ra						
6	Forms o	f asse:	ssment:	-incai Aigeb	. u						
				examinatio					project	work, or	al
				nination acc			the c	ourse			
7				ard of credit	points						
8	Module	exam	ination	pass ule (in the fol	lowing	ı etudi	/ nrogr	ammec)			
0				s (B.Sc.)	TOWING	study	progr	aiiiiies)			
9				de for the fina	l grad	e:					
	accord	ing to	BRPO								
10	Module										
1.1	Prof. Di Other in			rg Horst							
11				nounced at t	the he	ainni	na of t	he cours	<b>e</b>		
				summarised						ture.	
12	Languag		, , , , , ,					12 7 9			
	Germar	1		_							

Dig	ital Sigr	nal Proces	ssing						DSIG	
	ntification nber:	Workload:	Credits:	Stud	y sem	ester:	Frequenc	y of the	Duratio	on:
104	14	150 h	5	4th	or 6th	1			1 sem	
1	Course:		Planned group	o sizes	Scop	e	actual of time / classroot teaching	om	Self-stu	dy
	Lecture		60 students		0	SCH	0	h	0	h
	Sem. les	ssons	30 students		4	SCH	60	h	90	h
	Exercise	9	20 students		0	SCH	0	h	0	h
	Practica seminar	•	15 students		0	SCH	0	h	0	h
	study	sed self-	60 students		0	SCH	0	h	0	h
2			competences: e basic knowle							
3	computers and know the problems of the sampling theorem. They will be able to use the Discrete Fourier Transform (DFT) in comparison to the continuous spectral analysis for linear dynamic systems to understand the approximation problem.									
	•	Fourier tra signals Sampling t DFT and lir Fast Fourie Various alg	information, on sformand lin heorem, record discretes ar Transform porithms on digital fi	ear di nstruc systen	fferei tabilit ns, im	ntial ed by of the pulse of	quations, ne contini response	uous sig / freque	nal	
4		f teaching:			,					
5		ation require	ements:							
	Formal:	Mod	lules: 3 Differential I	Equati	ions					
	Content	: Mod 104	lules: 3 Differential I							
6	Term p	f assessmei aper, writt		n, cor	mbine				assessm	ent,
7	Prerequ	isite for the examinati	award of credit	points						
8	Applicat	ion of the m	odule (in the fo	llowing	study	/ progr	ammes)			
9	Importa	nce of the g	rade for the fina	_						
10	Module	coordinator:		graded	elec	tive su	ıbject			
			Jörg Horst				·			
11		formation: ure will be a	announced at	the be	eginni	ng of t	he cours	e.		
12	Languag	je:			_	_				
	Germar	า								

Dis	crete Ma	athematic	cs								DM	
	ntification nber:	Workload:		Credits:	Stud	y sem	ester:	(	Frequenc <sup>o</sup>	y of the	Duration:	
104	16	240 h		8	5th	sem.			Annual (Winter)		1 sem	<b>).</b>
1	Course:		PI	anned group	sizes	Scop	pe .		Actual continue / classroot teaching	om	Self-stu	dy
	Lecture		60	) students		0	SCH		0	h	0	h
	Sem. lessons			) students		4	SCH		60	h	180	h
	Exercise	9	20	) students		0	SCH		0	h	0	h
	Practical or seminar Supervised self-			students		0	SCH		0	h	0	h
2	study	sed self- g outcomes/		) students		0	SCH		0	h	0	h
3	The students know the essential basic concepts and the corresponding fields of application of graph theory, formulate relevant real-world problems (case studies) into discrete graph models and solve them using suitable graph algorithms.											
	•	digraphs Maximum Bipartite g Matchings Eulerian ar	flow rap	of spannin	um c	ost c Iems	irculat		-			vorks
4		f teaching:	2115	and Colour	iiig pi	obiei	<u> </u>					
т			n ac	tive exercis	se cor	npone	ents					
5		ation require										
	Formal:											
	Content	:										
6		f assessme n examinat	-	combination	on exa	amina	ition o	r	oral exa	minatio	n	
7		isite for the examinati		ord of credit   Dass	points							
8	Applied	l Mathema	tics		_		y progr	a	mmes)			
9	accord	ing to BRP(	)	e for the fina	ıl grad	e:						
10	Prof. Di	coordinator: r. Jonas Id										
11	Literati			ounced at t ummarised							ture.	
12	Languag Germar	je:							. , <u>,</u>			

Fin	ancial M	lathemati	cs and Inve	stmen	t Ma	nagem	ent		FMI	
	ntification ber:	Workload:	Credits:	Stud	y sem	ester:	Frequen offer	cy of the	Durat	ion:
109		240 h	8	5th sem	or 6tl I.	n			1 ser	n.
1	Course:		Planned grou	p sizes	Sco	oe	Actual time / classro teachi		Self-st	ıdy
	Lecture		60 students		0	SCH	0	h	0	h
	Sem. les	ssons	30 students		4	SCH	60	h	180	h
	Exercise	)	20 students		0	SCH	0	h	0	h
	Practica seminar		15 students		0	SCH	0	h	0	h
		sed self-	60 students		0	SCH	0	h	0	h
2	The stu mather	idents kno matics and	competences: w basic mathe can apply the							nent.
3	Portfoli Mechai swaps,	stic modell to optimisa nics and va hybrid sec	luation of der			·		its (futur	es, opti	ons,
4		f teaching: essons with	n active exerc	ises ar	nd sm	aller pr	ojects			
5	Participa Formal:	ation require	ements:							
	Content	Fina but 100 104 109 Mat 113 114	vious knowled ancial and Act useful; maths 3 Analysis; 3 Differential 9 Principles of thematics; 9 Linear Algel 0 Linear Option 6 Numerical N	tuarial s skills Equat f Busin bra; misatio Mather	Math of thions; less A	ematic e first t	s" (110 :wo yea	0) is not rs, e.g.,	a prere modules	quisite,
6	Forms o	f assessme	nt:							
-	Term p	aper, writt	en examinatio					, project	work, c	ral
7	examination or examination accompanying the course  Prerequisite for the award of credit points:  Module examination pass									
8	Applicat	ion of the m	nodule (in the fo	ollowing	g stud	y progra	ammes)			
9			tics (B.Sc.) rade for the fin	al grad	le:					
-	accord	ing to BRPC	)	_						
10	Module	coordinator		n						
	_	. ICI. Hac.	Cidadia Cotti	• •						

	The course material is summarised in a script that accompanies the course.
12	Language:
	German

Ger	nder and	d Dive	ersity:	Success Fa	actors	for (	Compa	anies		GUD	
	ntification ber:	Work	load:	Credits:	Stud	y sem	ester:	Frequen	cy of the	Durati	on:
313		150	h	5	5th	sem.	-)	1 sem	٦.		
1	Course:			Planned grou	p sizes	Scor	e	Actual time / classro teachir		Self-stu	ıdy
	Lecture			60 students		2	SCH	30	h	45	h
	Sem. les	ssons		30 students		2	SCH	30	h	45	h
	Exercise	)		20 students		0	SCH	0	h	0	h
	Practica seminar			15 students		0	SCH	0	h	0	h
	Supervis		lf-	60 students		0	SCH	0	h	0	h
3	Learning The stu	idents know and d know Discri are se indep chang are a conce asses are fa discor conce in a c	the ter iversity legal p mination ensitise endent ges in t ble to epts sur s their miliar v eptual id	rms, history y/diversity n rinciples in ton Directive ed to human ly recognise he business independent as genderelevance for with selected diversity made to context.	nanago the co , Gene heter e stere enviro ntly co er mair or prof d theo nanage	emen ntext ral Ac ogene otypil onmei ollect astrea essio ories a	t. of generation English of and of the relevanting a of and application, but a of and, but a of and, but a of and, but a	nder and qual Tre the corp I can de ant infor and dive ctice. proaches	diversity at ment) orate covelop ide mation arity mation the conthis, continuity are continuity and contribution are continuity and contribution are continuity are continuity and contribution are contri	y (e.g. E ntext. eas for p on esta inageme urrent can deve	U Anti- lossible blished ent and
4	<ul> <li>Definitions of terms and delimitation of gender and diversity</li> <li>Concepts and approaches to equal opportunities (e.g. diversity management, gender mainstreaming)</li> <li>Legal bases and political influences (e.g. EU Anti-Discrimination Directive, General Act on Equal Treatment [AGG])</li> <li>Subjective and societal values, attitudes and prejudices in the context of diversity</li> <li>Possible approaches for taking diversity characteristics (e.g. gender and age) into account in selected areas of business (marketing, product development, human resources)</li> <li>Concept for the sustainable introduction of holistic diversity management</li> <li>Case studies and application examples from business practice</li> </ul> Forms of teaching: Lecture, Sem. lessons, presentation, group work, presentation of seminar paper								der and product gement		
5	Participa	ation re	equirem	ients:	·						·
	Formal:										
	Content		None								

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

Prin	ciples o	f Data	Scien	се						GDS		
Iden numl	tification per:	Work	oad:	Credits:	Stud	y sem		Frequenc offer:	y of the	Duratio	n:	
1402		240		8	5. se 6. se	m. or m.				1 sem.		
1	Course:			anned group zes:	Ď	Scop	e:	Actual c time/cla teaching	ssroom	Self-st	udy	
	Lecture	6		) students			SCH		h		h	
	Sem. lessons			) students		4	SCH	60	h	160	h	
	Exercise			) students			SCH		h		h	
	Practical or seminar			students		0	SCH	0	h	0	h	
	Supervised self- study			) students			SCH		h		h	
2	Learning	g outc	omes/c	ompetences	5:							
	<ul><li>ar</li><li>re</li><li>va</li><li>kr</li><li>us</li><li>by</li></ul>	e able gress samp alue, now al se con a str	e to explion and ing, boo gorithm crete exp	plain the basic concepts of scientific thinking presented erences between chance and causality, plain, apply and implement the fundamentals of non-lind the basic principles of simulation-based inference succepts ootstrap distribution, shuffling, permutation distribution ms from the field of machine learning and deep learning examples to put them into practice, know what is under all causal model and by a directed acyclic graph and can							has n, p- g and stood	
3	Content											
	da • Ex • CI • Re • Pr ur • Al	ata co xplora prrelat assific esamp inciple nsupe gorith ompor	llection, tory dat ion bety cation (I ling pro es of ma vised le ms fron ients an	antitative d , data prepa ; a analysis ( ween numer logistic regro cedure (boo achine learn earning, reir n the field o nalysis, clust	ratior analy ical v essior otstra ing ar iforce f data	n) sis of ariable n, non pping nd dee ment a scier	categ es) -linea ) ep lear learni nce/ma	orical and r regression rning (suping) achine lea	I numerion)  pervised  arning (p	cal data learning	,	
4	Forms o		hing:									
	Sem. les											
5	Participa	ation r	equiren	nents:								
	Formal: Content		Module: 1003 Ar 1139 Lii		a;							
6	Form of	asses	sment:									
				examination nation acco					, project	t work, (	oral	
7	•			ward of cred	dit po	ints:						
	Module 6											
8	Applicat Applied			dule (in the (B.Sc.)	follov	ving s	tudy p	rogramm	es):			

9	Importance of the grade for the final grade:
	according to BRPO
10	Module coordinator:
	Prof. Dr. rer. nat. Jörg Horst
11	Other information:
12	Language:
	German

Pri	nciples o	of Con	npute	r Science						INF	
	ntification nber:	Work	load:	Credits:	Stud	y sem	ester:	Frequence	y of the	Durati	ion:
109	98	240 ł	า	8	1st s	sem.		Annual (Winter)		2 sen	<b>n.</b>
L	Course:		P	Planned group		sizes Scope		Actual contact time / classroom teaching		Self-study	
	Lecture		6	0 students		0	SCH	0	h	0	h
	Sem. les	ssons	3	30 students		4	SCH	60	h	40	h
	Exercise	9	2	20 students		0	SCH	0	h	0	h
	Practica seminar		1	15 students		4	SCH	60	h	80	h
	Supervis	sed sel	f- 6	0 students		0	SCH	0	h	0	h
		esignin	g and ir	fication for a nplementing	the mo	odules	in a ge	eneral prog			
	- s e They are	esignin ystema rrors. able to	g and ir itic testi handle		the mo	odules ecifica ware e	in a ge tion an enginee	eneral prog d, if neces ring enviro	sary, res	solving o	ccurr
3	- s e They are	esignin ystema rrors. able to s know	g and ir itic testi handle	nplementing ng based on a professior	the mo	odules ecifica ware e	in a ge tion an enginee	eneral prog d, if neces ring enviro	sary, res	solving o	ccurri
3	- si e They are Students  Content - Ii - P p - Ii si co	esignin ystema rrors. able to s know  s: ntroduc rinciple rogram nforma ystems ompute lgorithi orting, rogram lement rogram nput/ou pplicat	ction: Coes: Basic ming la tion pre er., conver er. m: Defir search ming: C ary data ming la itput, exion of the	nplementing ng based on a professior	nce def f a com mpilers haracte n base: sentation Arrays aple and perator	odules ecifica ware e athem finition puter s, interes, cos, arithon med gram to gram t	n, comp (von Norpreters ding, norpreters ding, norpreters ding, norpreters ding, norpreters ding, norpreters ding norpreters ding norpreters ding norpreters ding norpreters	eneral prog d, if neces ring enviro s in the fie buter classi eumann an s, linkers umber sys number re structuring and debug binary tree lata types, uctures, ful debugger	fication rehitecture, completes, associated inctions	re), ace value tation in taces, and met	e the ursio
	- si e They are Students  Content - Ii - P p - Ii si co	esignin ystema rrors. able to s know  s: ntroduc rinciple rogram nforma ystems ompute lgorithi orting, rogram lement rogram nput/ou pplicat ction to	ction: Coes: Basic ming la tion pre tion pre m: Defin search ming: Cary data ming la itput, exion of the the pro	omputer scie structure of nguages, co sentation: Crsion betwee nition, representations of structures: nguage: Simple development of the structures: nguage: Simple development of the structures of the structure	nce def f a com mpilers haracte n base: sentation Arrays aple and perator	odules ecifica ware e athem finition puter s, interes, cos, arithon med gram to gram t	n, comp (von Norpreters ding, norpreters	eneral prog d, if neces ring enviro s in the fie buter classi eumann an s, linkers umber sys number re structuring and debug binary tree lata types, uctures, ful debugger	fication rehitecture, completes, associated inctions	re), ace value tation in taces, and met	e the ursion
1	- si e They are Students  Content - Ii - P - Ii si co	esignin ystema rrors. able to s know  s: ntroduc rinciple rogram nforma ystems ompute lgorithi orting, rogram lement rogram nput/ou pplicat ction to  f teach	tion: Coes: Basicon presser m: Defin search aming: Carring latton of the the prosection of the the prosection.	a profession opportunities opp	nce def f a com mpilers haracte n bases sentation ia, prog Arrays ial, prog perator perator ent env	finition puter s, interess, cos, arithon med d comprise corrivorum athem	n, comp (von Norpreters ding, norpreters	eneral prog d, if neces ring enviro s in the fie buter classi eumann an s, linkers umber sys number re structuring and debug binary tree lata types, uctures, ful debugger	fication rehitecture, completes, associated inctions	re), ace value tation in taces, and met	e the ursion
	- si e They are Students  Content - Ii - P - Ii si co	esignin ystema rrors. able to s know  s: ntroduc rinciple rogram nforma ystems ompute lgorithi orting, rogram lement rogram nput/ou pplicat ction to  f teach	tion: Coes: Basicon presser m: Defin search aming: Carring latton of the the prosection of the the prosection.	a profession opportunities opp	nce def f a com mpilers haracte n bases sentation ia, prog Arrays ial, prog perator perator ent env	finition puter s, interess, cos, arithon med d comprise corrivorum athem	n, comp (von Norpreters ding, norpreters	eneral prog d, if neces ring enviro s in the fie buter classi eumann an s, linkers umber sys number re structuring and debug binary tree lata types, uctures, ful debugger	fication rehitecture, completes, associated inctions	re), ace value tation in taces, and met	e the ursio

6	Forms of assessment:
	Term paper, written examination, combined examination, project work, oral examination or examination accompanying the course
7	Prerequisite for the award of credit points:
	Module examination pass
8	Application of the module (in the following study programmes)
	Applied Mathematics (B.Sc.)
9	Importance of the grade for the final grade:
	according to BRPO
10	Module coordinator:
	DiplIng. Jens Schönbohm
11	Other information:
	Literature will be announced at the beginning of the course.
	The course material is summarised in a script accompanying the lecture.
12	Language:
	German

	nciples o themati		ss Admir	nistratio	n and I	Busine	ess		BWW	M
	ntification nber:	Workload	: Cred	its: St	udy sem	ester:	Frequenc	cy of the	Duration:	
109	9	240 h	8	1:	st sem.		Annual (Winter	)	2 sem	1.
1	Course:		Planned group sizes		es Sco	ре	Actual contact time / classroom teaching		Self-study	
	Lecture		60 stude	ents	0	SCH	0	h	0	h
	Sem. lessons		30 stude	ents	8	SCH	120	h	120	h
	Exercise	9	20 students		0	SCH	0	h	0	h
	Practica seminar		15 stude	15 students		SCH	0	h	0	h
		sed self-	60 stude	60 students		SCH	0	h	0	h
3	quantit (2) Int Studer technic	tative met terdisciplii its compet ques. udents kno	nermore, the hods in the hods	e optimis ly basic i	sation o research	f econo	omic struentation	and doc	nd proc	esses :ion
	Introdu Role of Operat Econor Overvie of busin Proces Basic to Manage Basics Busines adminis Quantir Investi	the enter ional objectional objection of the finess, invections and record accounts Mathen stration battative met appr	ole framework stment an e product models unting: ting, cost natics Bas	of busing the finance of the finance of the first the fi	ness ope ing, etc itilisation ing and e conte and dec	eration .) on (prod control xt of th cision s	curemen lling ne above upport ir athemat	t, product, product -busines n compar	ction, sa	les):
4	Forms o	f teaching:					LICIAIIS II	econor	THE HEIGS	) <b>.</b>
5		ation requir			, , , , , ,	-				
	Formal:									
	Content	::								
	Forms o	f acceceme	nt: ten examination, combined examination, project work, oral xamination accompanying the course							
6		aper, writ	ten exami					project	work, o	ral
6 7	examin	aper, writ ation or e	ten exami	n accom	panying			project	work, o	ral

8	Application of the module (in the following study programmes)
	Applied Mathematics (B.Sc.)
9	Importance of the grade for the final grade:
	according to BRPO
10	Module coordinator:
	Prof. Dr. rer. nat. Claudia Cottin
11	Other information:
	Literature will be announced at the beginning of the course. Accompanying material will be provided (e.g. short script and calculation examples using Excel)
12	Language:
	German

Prin	nciples	of Financi	al and Actua	rial M	athe	matics	5		GFV	М
	ntification ber:	Workload:	Credits:	Stud	y sem	ester:	Frequen offer	cy of the	Durati	ion:
110	0	240 h	8	5th sem	or 6tl ı.	1			1 sen	n.
1	Course:		Planned grou	Scope		Actual contact time / classroom teaching		Self-stu	ıdy	
	Lecture		60 students		0	SCH	0	h	0	h
	Sem. les	ssons	30 students		4	SCH	60	h	180	h
	Exercise	<u>)</u>	20 students		0	SCH	0	h	0	h
	Practical or seminar		15 students		0	SCH	0	h	0	h
	Supervised self- study		60 students		0	SCH	0	h	0	h
3	The stu	idents kno al mathem	competences: w basic mathe atics and can							ind
4	• Forms o	well as risl Exemplary and valuat building so f teaching:	nematical prir xy cash flows applications ion of fixed-ir ociety savings n exercises ar	of the nterest contra	basio secu acts a	princip rities, c s well a	oles and Ierivativ	l models e financi	in the a al instru	analysis
5					p. c.	, , , , , , , , , , , , , , , , , , , ,				
	Participation requirements:  Formal:  Content:  Basic knowledge of business administration approximately to the extent of the courses in the first two semesters. Knowledge mathematics approximately to the extent of the first 4 semester e.g. modules:  1003 Analysis; 1099 Principles of Business Administration and Business Mathematics; 1043 Differential Equations; 1139 Linear Algebra; 1140 Linear Optimisation; 1186 Numerical Mathematics;								edge in	
6	Forms o	f assessme	1 Stochastics	•						
•	Term p	aper, writt	en examinati kamination ac					, project	work, o	ral
7			award of credit			, trie CC	ui SC			
,		examinati		. 2011103	-					
	Application of the module (in the following study programmes) Applied Mathematics (B.Sc.)									
8				onowing	,	, p. 0 3. 0	,			
8	Applied Importa	Mathema	tics (B.Sc.) grade for the fir			, p. 03. c				
	Applied Importa accord	l Mathema	tics (B.Sc.) grade for the fir O			, p. 0 9. 0	,			

11	Other information:
	Literature will be announced at the beginning of the course. The course material is summarised in a script that accompanies the course.
12	Language:
	German

Inte	erpolati	on ar	nd App	oroximation	า					IUA	
Ider num	itification ber:	Work	cload:	Credits:	Stud	y sem	ester:	Frequenc offer	y of the	Durat	ion:
111	7	240	h	8	5th sem	or 6th	า			1 ser	n.
1	Course:			Planned grou	p sizes	o sizes Scope		Actual contact time / classroom teaching		Self-st	udy
	Lecture			60 students		0	SCH	0	h	0	h
	Sem. lessons			30 students		4	SCH	60	h	180	h
	Exercise			20 students		0	SCH	0	h	0	h
	Practical or seminar			15 students		0	SCH	0	h	0	h
	Supervised self- study		lf-	60 students		0	SCH	0	h	0	h
3	of inter with th	polat ese m oleme	ion and ethod	ar with the d approxima s. They are a ction interpo	tion of Ible to	func estin	tions a nate ar	ınd can s ıd interpr	olve pra	actical p	roblem
	•	Lagra Error Discre Linea Bezie	nge, H estima ete and r, squa r curve	nterpolation lermite and fation in polyr d continuous are and cubic es and applic	Newto nomial Gauss spline ations	n inte inter sian a es. B- s. De (	rpolati polatio pproxi Spline Castelj	on methon n mation s au's algo	ods rithm		
4	Forms o	f teac	ning:	on by ration	arrund	LIOTIS	. Paue	арргохіі	IMIIL		
5	Participa		_	nents:							
5	Formal:										
	Content		1139 1186	Analysis; Linear Algel Numerical N		<u>matic</u> :	S				
6		aper,	writte	n examinatio					project	work, c	ral
7	Prerequ Module	isite fo	r the a	mination ac ward of credit n nass	points	: :	i the Co	Juise			
8	Applicat	ion of	the mo	dule (in the fo cs (B.Sc.)	ollowing	g study	y progra	ammes)			
9		nce of	the gra	ade for the fin	al grad	e:					
10	Module	coordi	nator:	Svetozara Pe	trova						
11	Other information: Literature will be announced at the beginning of the course. Teaching content is summarised in a script accompanying the lecture.										
12	Languag Germar										

Col	loquium	ı								KOL	
	ntification	Workload:	Credits:	Stud	y sem	ester:		requency	y of the	Duratio	on:
num 129	ber:	90 h	3	6th or 7th			offer each semester				
129	U	90 11	3	sem	-	1	e	acrisei	nester		
				Seiii	•						
1	Course:		Planned group	sizes	sizes Scope			Actual c	ontact	Self-stu	dv
			3 3 3 4 4					time /			
								classroo			
					_			teaching		00	T .
	Lecture		60 students		0	SCH	_	0	h	90	h
	Sem. les	ssons	30 students		0	SCH		0	h	0	h
	Exercise	<u>,</u>	20 students		0	SCH	+	0	h	0	h
	Practica		15 students		0	SCH		0	h	0	h
	seminar	•									
	Supervi	sed self-	60 students		0	SCH		0	h	0	h
_	study										
2	_		competences:		!	<b></b>				Th	
			to be assess								
			er the candida								
			esis, its sub its non-su							justify	
			well as assess							justify	CHEIH
	Писре	identity as	WCII 43 433C33	CHCII	Sigiiii	icarice		or pract	icc.		
3	Content	s:									
	- Cont	ent of the t	hesis accordir	na to t	he to	pic					
			he procedure				on o	of the t	hesis ar	nd the	
			arose in the co								
4		f teaching:									
			or the bachel	orthe	sis						
5		ation require									
	Formal:	None	•								
_	Content	: Trea f assessmen	tment of the l	oache	orth	esis					
6			ıt:								
7		amination	award of credit	nointe							
/	rielequ	isite for the a	awaru or credit	points							
8	Applicat	ion of the mo	odule (in the fo	llowing	study	/ proar	am	nmes)			
	Applied		atics (B.Sc.),	_				•	av (B.	Sc.). Fl	ectrical
	Engine	ering (B.En	ig.), Compute	er Enc	jineer	ing (E	3.E	ing.), №	lechani	ical Engir	neering
	(B.Eng.	.), Mechat	ronics (B.Sc.)	), Rer	newal	ole Én	ner	gies (E	B.Eng.)	and Ind	dustria
	_	-	anagement (I	,							
9	•		rade for the fina	ıl grad	e:						
		ing to BRPO									
10		coordinator:									
	N.N.										
11	Other information: Literature will be announced at the beginning of the course.										
1.			innounced at	rue pe	ginni	ng of t	ιne	e course	e		
12	Languag										
	Germar	I									

Cor	nplex A	nalys	is							KAN	4
	ntification lber:	Work	load:	Credits:	Stud	y sem	ester:	Frequen offer	cy of the	Durat	ion:
112	2	240	h	8	5th sem	or 6th	1			1 ser	n.
1	Course:		P	lanned group	sizes	s Scope		Actual time / classro teachir		Self-study	
	Lecture		6	0 students		0	SCH	0	h	0	h
	Sem. lessons			0 students		4	SCH	60	h	180	h
	Exercise			0 students		0	SCH	0	h	0	h
	Practical seminar			5 students		0	SCH	0	h	0	h
2	Supervised self- study Learning outcomes			0 students		0	SCH	0	h	0	h
3		n app		nplex function to concrete			eirairre	erentiab	iity and i	ntegrat	oility
J	•	Comp Möbiu Comp Integ Inver Resid	lex differ ral theo se funct ual theo	formations erentiable fu rems :ions	ınctio	ns					
4	Forms o		_								
_	Sem. le										
5	•	ition r	equireme	ents:							
	Formal: Content		Module	nc:							
			1003 A	Analysis							
6	examin	aper, ation	written or exan	examinatio nination acc	ompa	nying			, project	work, c	ral
7			r the aw nination	ard of credit	points	:					
8	Applicati	ion of	the mod	pass ule (in the fol	llowing	ı study	/ progr	ammes)			
O				s (B.Sc.)	iio wiiilg	, stuu)	, progr	ariiiie3)			
9				le for the fina	l grad	e:					
,	accordi		_		5. 44	J.					
10	Module										
				ard Bachma	nn						
	Other in										
11	Literati			nounced at	the he	qinni	ina of t	he cour	Se		
11	Literatı Languag	ıre wi		nounced at	the be	eginni	ng of t	he cour	se.		

Cry	ptogra	ohy								KRY	
	ntification ber:	Work	cload:	Credits:	Stud	y sem	ester:	Frequenc	y of the	Durat	ion:
113	3	240	h	8	5th sem	or 6th	า			1 ser	n.
1	Course:			Planned grou	p sizes	Scop	pe .	Actual of time / classro teachin	-	Self-st	udy
	Lecture			60 students		0	SCH	0	h	0	h
	Sem. les	ssons		30 students		4	SCH	60	h	180	h
	Exercise	)		20 students		0	SCH	0	h	0	h
	Practical or seminar			15 students		0	SCH	0	h	0	h
	Supervi study	sed se	lf-	60 students		0	SCH	0	h	0	h
2	Learning	goutco	omes/c	ompetences:							•
	of cryp	togra	phy. T	the basic pr hey are able Imber theory	to unc						dures,
	•	Prime Simpl Public Crypt Crypt Crypt	numb e cryp key c ograp ograp	rties of the Z er tests and stosystems for ryptosystem hic application hic application hic hash fundatures	I factor or enci ons of consors o	risatio yptio discre	n metl n ete loga	arithms	uations		
4	Forms o	f teac	hing:								
5	Participa			nents:							
•	Formal:		T '								
	Content	:		ıles: Analysis; Linear Algel	bra						
6	Forms o										
				n exam, con ct work, oral							
7	Prerequ Module			ward of credit n pass	points	:					
8	Applicat	ion of	the mo	dule (in the fo	ollowing	stud <sub>y</sub>	y progr	ammes)			
9		nce of	the gr	ade for the fin	al grad	e:					
10	Module	coordi	nator:	hard Bachma	ann						
11	Other in			a.a baciiile	a1111						
11	Literat	ure w	ill be a	nnounced at						ture.	
12	Languag	je:	. realite la	2 3 4 7 11 10 11 10 10 10 10 10 10 10 10 10 10	u	zenpe	. 45501	و۱۱۱ ۲۱۱ کی۔	2	-3.01	
	Germar	1									

Lin	ear Alge	bra									LA	
	ntification iber:	Workload	l:	Credits:	Stud	y sem	ester:		requenc	y of the	Durati	ion:
113	9	450 h		15	1st s	sem.			Annual (Winter)	1	2 sen	n.
1	Course:		PI	Planned group sizes			e	Actual contact time / classroom teaching		Self-stu	ndy	
	Lecture		60	) students		8	SCH		120	h	180	h
	Sem. les	ssons	30	) students		0	SCH		0	h	0	h
	Exercise			) students		4	SCH		60	h	90	h
	Practica seminar			15 students		0	SCH		0	h	0	h
	Supervis study			) students		0	SCH		0	h	0	h
2				npetences:							_	
	Students have an overview of matrix theory and solution methods for systems of linear equations as a fundamental part of linear algebra											
3	Content											
				and bodies								
				systems of			tions					
				and affine		9						
				ear mapping								
				, eigenvalu								
				nsformation ce and the				111	arronn			
4		f teaching		ce and the	Scalai	proc	iuct					
4		with exe		25								
5		tion requi										
,	Formal:	Τ'										
	Content	: Mo	dule	:S:								
		_		lathematica	al Fou	ndatio	ons					
6		f assessm										
				examinatio						project	work, o	ral
				ination acc			the c	Οl	urse			
7	-			ard of credit	points							
		examina										
8		ion of the Mathem		ile (in the fol (B.Sc.)	ilowing	study	/ progr	ar	mmes)			
9	Importa		grad	e for the fina	ıl grad	e:						
10		coordinato										
10				etozara Pet	rova							
11		formation		2.024141 CC								
				ounced at t	the be	ginni	ing of t	th	e cours	e.		
				ummarised		_	_				ture.	
12	Languag					- 1			, 3			
	Germar	1										

Line	ear Opti	misa	tion							LOPT	
	itification ber:	Work	load:	Credits:	Stud	y sem	ester:	Frequen offer	cy of the	Duratio	on:
114		150	h	5	4th	sem.		Annual(Winter)		1 sem	<b>.</b>
1	Course:			Planned grou	Scop	pe	Actual time / classro teachir		Self-study		
	Lecture			60 students		0	SCH	0	h	0	h
	Sem. les	ssons		30 students		4	SCH	60	h	90	h
	Exercise			20 students		0	SCH	0	h	0	h
	Practica seminar			15 students		0	SCH	0	h	0	h
	Supervised self- study		lf-	60 students		0	SCH	0	h	0	h
2	Learning			ompetences:							
		hem v		ormulate pra e support of						ion tasks	s and
	•	of bas Simple Degei Dualit Sensi Interi	sis, infi ex and neracy y theo tivity a or-poil	c and non-banite case I two-phase and redundary and duals analysis ant method port problen	simple ancy simple	x me		solutions	s, permiss	sibility, c	change
4	Forms o										
	Sem. le										
5	Participa	ation r	equiren	nents:							
	Formal: Content		1139	Analysis; Linear Algel	ora						
6	project	aper, work	writte , oral e	n examination examination	or exa	minat				assessm	ent,
7	Prerequ Module			ward of credit n pass	points	:					
8	Applicat	ion of	the mo	dule (in the fo	llowing	study	y progr	ammes)			
9	Importa accord	nce of ing to	the gra BRPO	ade for the fin	al grad	e:					
10	Module of Prof. Di			Svetozara Pe	trova						
11	Other in										
				nnounced at summarised		_	_			ure	
12	Languag		recrit is	, 3011111011300	a 111 G S	эспри	. accol	- parry III	y cite lect	.urc.	
	Germar										

Log	jistics									LOG	
	ntification	Workload	i: Cred	its:	Stud	y sem	ester:	Frequenc	y of the	Duration	on:
114		150 h	5		4th o	or 6th	1	onei		1 sem	٦.
1	Course:		Planned	Planned group sizes			oe	Actual of time / classrooteachin	om	Self-stu	ıdy
	Lecture		60 stude	ents		0	SCH	0	h	90	h
	Sem. les	ssons	30 stude	ents		4	SCH	60	h	0	h
	Exercise	<u> </u>	20 stude	ents		0	SCH	0	h	0	h
	Practica seminar		15 stude	ents		0	SCH	0	h	0	h
	Supervised se study			60 students		0	SCH	0	h	0	h
2	Learning	outcome:	s/competen	ces:							
3	Students analyse and model concrete problems from different areas of operational logistics (location planning, material logistics, batch size planning, machine allocation planning, distribution logistics) and solve them with the help of suitable procedures.  Contents:  Basic principles of operational location planning (facility location)  Basic principles of material procurement and provision as well as stock-keeping planning  Machine allocation planning, scheduling  Transport and routing problems, vehicle routing  The corresponding (optimisation) models and solution methods are presented for selected problem characteristics of these different logistics areas. Associated case studies are worked on in small project groups (problem analysis, modelling, solution finding).										
4		f teaching	: th active e	vorci	20.000	nnon	onto				
		ation requi		ACI CIS	5C C U I	ilbout	-111.5				
5	Formal:	T I	i cilicilis.								
	Content										
6		f assessm	enti								
6		aper, writ	ten exami	natio	n, cor	nbina	tion ex	aminatio	n, proje	ect work	or oral
7		isite for the examina	e award of o	credit	points:						
8	Applicat	ion of the	module (in atics (B.Sc		llowing	study	/ progra	ammes)			
9	Importa	nce of the	grade for the Oor SPO	ne fina			tive su	biect			
		ind to BKF			Hauci			J			
10	Module (	coordinato	r:		rauec						
	Module of Prof. Dr	coordinato r. Jonas I	r: de		jrauec						
10	Module of Prof. Dr Other in Literati	coordinator. Jonas I formations ure will be	r: de e announce	ed at 1	the be					ture.	
	Module of Prof. Dr Other in Literati	coordinato r. Jonas I formation: ure will be ng conter	r: de	ed at 1	the be					ture.	

Mat	themati	cal Found	ations						MGL	
	ntification ber:	Workload:	Credits:	Stud	y sem	ester:	Frequen offer	cy of the	Durati	on:
116	1	150 h	5	1st s	sem.		Annual (Winte	r)	1 sen	n.
1	Course:		Planned group	p sizes	Scop	oe	Actual time / classro teachir		Self-stu	ıdy
	Lecture		60 students		3	SCH	45	h	67.5	h
	Sem. lessons		30 students		0	SCH	0	h	0	h
	Exercise	2	20 students		1	SCH	15	h	22.5	h
	Practica seminar		15 students		0	SCH	0	h	0	h
	Supervis study		60 students		0	SCH	0	h	0	h
2	The stu	idents mas natics and	competences: ter elementar are able to ap	y proc ply ma	of tecl athen	hnique natical	s and log I techniq	gical reas ues to ba	soning ir asic	1
	•	Elementar Equations	structure of now y proof technic and inequalitie eometry in 2 a	ques es	·		cluding (	complex	numbers	5
4		f teaching:								
		e with exer								
5		tion require	ements:							
	Formal:									
	Content									
6	Term p	ation or ex	en examinatio amination acc	compa	nying			, project	work, o	ral
7	Module	examination								
8	Applied	Mathemat	odule (in the fo tics (B.Sc.)			y progr	ammes)			
9	accordi	ing to BRPC		al grad	e:					
10	Dr. mat	coordinator: ch. Elke Ko								
11		formation:								
			announced at is summarised		_	_			ture.	
12	Languag Germar	je:					. , .			

Mat	:hemati	cal Modell	ing of Proces	sses l	Relev	ant to	o Practi	ce	ММР	•
num		Workload:	Credits:		,	ester:	Frequer offer	ncy of the	Duratio	
130	1	240 h	8	4th	sem.				1 sem	
1	Course:		Planned group	Scope		Actual contact time / classroom teaching		Self-stu	dy	
	Lecture		60 students		0	SCH	0	h	0	h
	Sem. les	ssons	30 students		4	SCH	60	h	180	h
	Exercise	2	20 students		0	SCH	0	h	0	h
	Practica seminar		15 students	0	SCH	0	h	0	h	
2	study	sed self-	60 students competences:	0	SCH	0	h	0	h	
	probler various help of	ns from the model form suitable s	They are able e natural scie malisms and o oftware. In a means of coi	ences can cr dditio	and t eate n, th	the eco simple ley ac	onomy. models quire th	To this e indeper	end, the ndently v	y know vith the
	<ul> <li>Methodology of mathematical modelling</li> <li>Statistical models</li> <li>Linear models</li> <li>Nonlinear models</li> <li>Discrete time models</li> <li>Business process models</li> </ul>									
4		f teaching:								
	Sem. le									
5	-	ation require								
	Formal: Content	sem	e wledge of mat esters. Basic roximately the	knowl	edge	of pro	grammir	ng with M	IATLAB	first 4
6	Term p examin	f assessmen aper, writte ation	t: en examinatio	n, coi	mbina					or oral
7	•	isite for the a examinatio	award of credit on pass	points	:					
8		ion of the mo	odule (in the foics (B.Sc.)	llowing	study	y progr	ammes)			
9	Importa		ade for the fina	al grad	e:					
10	Module	coordinator: Jonas Ide								
11	Other in	formation:	nnounced at	the be	eginn	ina of t	the cour	se.		
12	Languag	je:			- 5					

Mat	themati	cal Pros	eminar						PSE	1
	ntification iber:	Workload	1: Credits:		•	ester:	offer	cy of the	Durat	ion:
116	2	180 h	6	5th	sem.		Annual (Winte	Annual (Winter)		n.
1	Course:		Planned gro	Planned group sizes			Actual time / classro teachi		Self-st	udy
	Lecture		60 students		0	SCH	0	h	0	h
	Sem. les	ssons	30 students			SCH	0	h	0	h
	Exercise	)	20 students		0	SCH	0	h	0	h
	Practica seminar		15 students	5 students		SCH	60	h	120	h
	study	sed self-	60 students s/competences:		0	SCH	0	h	0	h
	Students have improved their skills in the written and oral presentation of subject-related topics by working on a given topic related to mathematics, summarising it in writing, and presenting it in a lecture of approximately one hour.									
3	Content				_					
	Selected topics with mathematical reference									
4		f teaching		ion and	lnroc	ontatio	n of a a	ivon toni	c with	
		uent disc	itten composit	ion and	pres	entatic	лгога у	iven topi	C WILII	
5		ation requi								
	Formal:									
	Content:  Modules: 1003 Analysis; 1099 Principles of Business Administration and Business Mathematics; 1043 Differential Equations; 1098 Principles of Computer Science; 1139 Linear Algebra; 1140 Linear Optimisation; 1186 Numerical Mathematics; 1188 Object-Oriented Programming; 1203 Principles of Physics and Engineering; 1251 Stochastics; 1246 Software Lab 1; 1247 Software Lab 2									
6		f assessm								
7			ent or examina e award of cred			banyın	g tne co	urse		
7	-		tion pass	ic points	•					
8	Applicat	ion of the	module (in the fatics (B.Sc.)	following	g stud	y progr	ammes)			
9	Importa	nce of the	grade for the fi O or SPO if ur			tives	ıhiect			
10	Module	coordinato	r:	_	ا حادل	LIVE SU	ibject			
11		r. phil. Be formation	rnhard Bachm	ann						
ΤŢ			announced a	t tha h	oginn	ing of t	ho cour	20		

12	Language:
	German

Ma	themati	cal Semin	ar						SEM				
	ntification nber:	Workload:	Credits:	Stud	y sem	ester:	Frequent	cy of the	Durati	on:			
116	53	180 h	6	6 6th sem.			Annual (Summer)		1 semester				
1	Course:		Planned grou	p sizes	Scop	ре	actual time / classro teachir		Self-stu	ıdy			
	Lecture		60 students		0	SCH	0	h	0	h			
	Sem. les	ssons	30 students		0	SCH	0	h	0	h			
	Exercise	)	20 students		0	SCH	0	h	0	h			
	Practica seminar		15 students		4	SCH	60	h	120	h			
	study	sed self-	60 students		0	SCH	0	h	0	h			
2	_		competences: to present m	athem	atica	ltopics	s in writir	ıg and oı	ally.				
3	Content		atical topics										
4		f teaching:	atical topics										
_			ten compositio	on and	pres	entatio	on of a gi	ven topi	c with				
		uent discu	•		μ.σσ		, <u></u>	. с сор.	• • • • • • • • • • • • • • • • • • • •				
5		ation require											
	Formal: Modules:												
	1162 Mathematical Proseminar;												
	Content	: Moc	Modules:										
			1003 Analysis;										
		1099 Principles of Business Administration and Business											
		Mathematics;											
		1043 Differential Equations;											
		1098 Principles of Computer Science;											
			1139 Linear Algebra; 1140 Linear Optimisation;										
			6 Numerical M			c•							
			8 Object-Orie			•	יו						
			3 Principles of										
			1 Stochastics			· · · · · · · · · · · · · · · · · · ·							
			6 Software La										
	<u> </u>		7 Software La	b 2									
6		f assessmer											
		s examinat											
7			award of credit	points	:								
0		examination of the m	on pass odule (in the fo	llowing	ı etud	/ nrogr	ammec)						
8			tics (B.Sc.)	MOWING	, stud	y progr	annies)						
9	Importa	nce of the a	rade for the fin	al grad	e:								
,	-	ing to BRPC		g. au									
10		coordinator:											
			nhard Bachma	ann									
11		formation:											
	Literati	ure will be a	announced at	the be	eginn	ing of t	he cours	se.					
12	Languag												
	Germar	1											

Мо	delling a	and S	imulat	ion						MUS	
	ntification ber:	Work	load:	Credits:	Stud	y sem	ester:	Frequenc	y of the	Duratio	on:
117		150	h	5		4th or 6th sem.				1 semester	
1	Course:			Planned group sizes			oe .	Actual of time / classroot teaching	om	Self-stu	dy
	Lecture			60 students		0	SCH	0	h	90	h
	Sem. les			30 students		4	SCH	60	h	0	h
	Exercise	9		20 students		0	SCH	0	h	0	h
	Practica			15 students		0	SCH	0	h	0	h
	seminar		16			0	CCII	0	1.	0	1.
	Supervi study	seu se	11-	60 students		١٠	SCH	١٠	h	U	h
2	Learning	outco	mes/co	mpetences:					I		1
	1.	How o	do I arr d it hav	e, they know ive at a mod ve? nalyse a mod	del for	a tim	ne-vary	ing syste	emand	what sco	ope
3	Content	s:									
	parame identifi Terms: dynami Practic Matlab	etric a catior Ident ic syst al par / Sim	nd non i, ifiabilit tems w t: Lapla ulink, s	Is and mode -parametric  y, controlla ith Gateaux ace transfor simulation of for example	mode bility, gradio mand f multi	obser ent m repre varia	trackir vabilit ethods sentat able mo	ng proble y, identifi s. ion of dif odels, an	m and p cation of ferentia alysis of	earamete of linear I equation f simulat	er ons in
4	Forms o										
5	Participa			nents:							
	Formal:										
	Content	:	Modu		Egust	ione					
6	Forms o	f asse		Differential	∟quat	10115					
U	Term p	aper,	writte	: n examination xamination :	•			•		assessm	ent,
7				vard of credit			c.orr au	ining the	204130		
,	Module										
				dule (in the fo	llowing	study	y progra	ammes)			
8				cs (B.Sc.)							
8											
9	Importa	nce of	the gra	de for the fin							
	Importa accord	nce of ing to	the gra				tive su	bject			
	Importa accord Module	nce of ing to coordi	the gra BRPO ( nator:	de for the fin or SPO if un			tivesu	bject			
9	Importa accord Module	nce of ing to coordi r. rer.	the gra BRPO ( nator: nat. J	de for the fin			tive su	bject			

Language:
German

Noi	nlinear (	Optin	nisatio	n							NLOF	т	
	ntification ber:	Work	load:	Credits:	Stud	y sem	ester:	Frequ		y of the	Durati	on:	
118	32	180	h	6	5th	sem.		Annı (Wir			1 semester		
1	Course:		F	Planned group	sizes	Scop	e .	tim clas			Self-stu	ıdy	
	Lecture		6	0 students		0	SCH	0		h	0	h	
	Sem. les	ssons	(3)	30 students		4	SCH	60		h	120	h	
	Exercise	9		20 students		0	SCH	0		h	0	h	
	Practica seminar			L5 students		0	SCH	0		h	0	h	
	Supervised self- study Learning outcomes			60 students		0	SCH	0		h	0	h	
2								_					
	Studer tasks a	its car nd so	n formul lve ther	late practica musing anal	ıl mod ytica	el sta I or nu	temer Imeric	itsas alme	non thoc	-linear ls.	optimisa	ation	
3	Content	s:											
J			nstraine	ed nonlinear	optim	izatio	n						
			cture of a descent procedure. Selection of the step length										
				decent and conjugate gradient method									
				n algorithm.									
				nonlinear op									
				Itipliers and								ditions	
	•	Nume	rical me	ethods for so	olving	nonli	near d	ptimi	satio	on prob	lems		
				<u>in practice (</u>	case s	studie	s).						
4	Forms o		_										
				ctive exercis	se cor	npone	ents						
5	· ·	ation r	equirem	ents:									
	Formal:		Modul										
	Content	:		es: Analysis;									
				Analysis, Linear Algeb	ra '								
				Numerical M		natics	6						
6	Forms o					, .							
				examinatio						project	work, o	rai	
	examin	ation	or exar	nination acc	ompa	nying	tne c	ourse					
7				ard of credit	points								
0	Applicat	ion of	ination	ule (in the fol	llowing	ı studi	/ nrogr	ammo	26)				
8				s (B.Sc.)	iio wiiiG	Juuy	progr	ammille	.3)				
9				de for the fina	ıl arad	e:							
,	accord	ing to	BRPO	2.0	J. 24								
10	Module	coordi	nator:										
				vetozara Pet	rova								
11	Other in			_									
				nounced at t									
			ntent is	summarised	in a s	script	accor	npany	ying	the lec	ture.		
12	Languag												
	Germar	1											

···	merics o	of Ord	inary [	Differentia	l Equa	ation	s			NDGL		
	ntification nber:	Work	load:	Credits:	Stud	y sem	ester:	Frequence offer	y of the	Duratio	on:	
118	33	240 ł	1	8	5th	or 6th I.	ר			1 sem	ester	
1	Course:		F	Planned grou	p sizes	Scop	oe .	Actual of time / classroot teaching	om	Self-stu	ldy	
	Lecture		$\epsilon$	0 students		0	SCH	0	h	0	h	
	Sem. les	ssons	3	0 students		4	SCH	60	h	180	h	
	Exercise			0 students		0	SCH	0	h	0	h	
	Practica		1	.5 students		0	SCH	0	h	0	h	
	Supervi		f- 6	0 students		0	SCH	0	h	0	h	
2	study Learning	g outco	mes/co	mpetences:			l	<u> </u>				
	The students know the most important methods for solving ordinary differential equations and their possible applications.  They can analyse initial and boundary value problems of ordinary differential equations with regard to numerical solvability and error behaviour, and select appropriate procedures.											
3		Contents:										
	Initial value problems:											
	One-step method, extrapolation method, multi-step method, predictor-corrector method. Stiff differential equations. Consistency, convergence, stability terms.											
				roblems:	ioris. C	JUI 1515	tericy,	Converge	ence, sc	ability te	:1115.	
		-	-	ulti-target	metho	d, dif	ference	e method	, variat	ion meth	nod.	
4	Forms o	f toach	ina:									
4			_									
_	Participa				Sem. lessons							
5		a (10 1 1 C	quirem	ents:								
5	Formal:											
5	Formal: Content		Knowle Algebr Equati Module 1003 A 1043 [ 1139 ]	edge of the a (1139), ons (1043) es: Analysis; Differential Linear Algel	Numei Equat ora;	rical ions;	Mather					
6		:	Knowle Algebr Equati Module 1003 A 1043 I 1139 I 1186 I	edge of the a (1139), lons (1043) es: Analysis; Differential	Numei Equat ora;	rical ions;	Mather					
	Content	ef asses	Knowle Algebr Equati Module 1003 / 1043 [ 1139 [ 1186 [ ssment:	edge of the a (1139), ons (1043) es: Analysis; Differential Linear Algel	Numei Equat ora; lather	rical ions; matics	Mather	matics (1	186) a	nd Diffe	erential	
6	Forms o Term p examin	f asses	Knowle Algebr Equati Module 1003 A 1043 I 1139 I 1186 I ssment: written	edge of the a (1139), sons (1043) es: Analysis; Differential inear Algeblumerical Mexamination accimination a	Numer Equationa; Mather	rical ions; matics mbine	Mather	matics (1	186) a	nd Diffe	erential	
	Forms o Term p examin Prerequ	of asses aper, value	Knowled Algebra Equation 1003 And 1043 In 1139 In 1186 And In	edge of the a (1139), sons (1043) es: Analysis; Differential inear Algebumerical Mexamination according and of credit	Numer Equationa; Mather	rical ions; matics mbine	Mather	matics (1	186) a	nd Diffe	erential	
6	Forms o Term p examin Prerequ Module	of assessaper, value ation of isite for examine the second control of the second control	Knowle Algebr Equati Module 1003 A 1043 I 1139 I 1186 N sment: written or exar the aw	edge of the ra (1139), ons (1043) es: Analysis; Differential inear Algebumerical Mexamination accordination accord	Equatora; lather on, cor compa	rical ions; matics mbine inying :	Mather  S  d exam  the co	matics (1 nination, ourse	186) a	nd Diffe	erential	
6	Forms of Term position Prereques Module Applicate	of assessaper, value ation of the examination of the second secon	Knowled Algebra Equation 1003 A 1043 I 1139 I 1186 For example or example the award in ation the model of the	edge of the ra (1139), ons (1043) es: Analysis; Differential inear Algeblumerical Mexamination accordance of credit pass ule (in the fo	Equatora; lather on, cor compa	rical ions; matics mbine inying :	Mather  S  d exam  the co	matics (1 nination, ourse	186) a	nd Diffe	erential	
6 7 8	Forms of Term prereques Module Applicate Applicate	of assessaper, value ation of the examination of the latest terms	Knowled Algebra Equation 1003 A 1043 I 1139 I 1186 For example the award in a time and the modern ematics.	edge of the ra (1139), ons (1043) es: Analysis; Differential inear Algeblumerical Mexamination according to the formula of the	Equatora; lather on, cor compa points	ions; matics mbine inying study	Mather  S  d exam  the co	matics (1 nination, ourse	186) a	nd Diffe	erential	
6	Forms o Term p examin Prerequ Module Applicat Applied Importa	of assessaper, vation of the examination of the math	Knowled Algebra Equation 1003 A 1043 I 1139 I 1186 I sement: written or example the award ination the modern at ice and the graduation of	edge of the ra (1139), ons (1043) es: Analysis; Differential inear Algeblumerical Mexamination accordance of credit pass ule (in the fo	Equatora; lather on, cor compa points	ions; matics mbine inying study	Mather  S  d exam  the co	matics (1 nination, ourse	186) a	nd Diffe	erential	
6 7 8	Forms of Term prereques Module Applicate Applicate	of assessaper, value ation of the examination of the model of the contract of	Knowled Algebra Equation 1003 A 1043 I 1139 I 1186 I second and ination the modern at ice the grade BRPO	edge of the ra (1139), ons (1043) es: Analysis; Differential inear Algeblumerical Mexamination according to the formula of the	Equatora; lather on, cor compa points	ions; matics mbine inying study	Mather  S  d exam  the co	matics (1 nination, ourse	186) a	nd Diffe	erentia	
6 7 8	Forms of Term pexamin Prerequest Applicate App	of assessaper, value ation of isite for ince of ing to coording	Knowled Algebra Equation 1003 A 1043 E 1139 E 1186 F Example The award and the grade BRPO Lator:	edge of the ra (1139), ons (1043) es: Analysis; Differential inear Algeblumerical Mexamination according to the formula of the	Equatora; Mather on, cor compa points ollowing	ions; matics mbine inying study	Mather  S  d exam  the co	matics (1 nination, ourse	186) a	nd Diffe	erentia	
6 7 8	Forms of Term policities accord Module Prof. Di Other in	of assessaper, value ation of the examination of the ing to coording.	Knowled Algebra Equation 1003 A 1043 E 1139 E 1186 F Example The award and the modern at least the grade BRPO Example BRPO	edge of the ra (1139), ons (1043) es: Analysis; Differential inear Algebumerical Mexamination accordination accordination according to the for the finde for the finde for the finde (B.Sc.)	Equatora; flather on, cor compa points flowing al grad	ions; matics mbine nnying study	Mather  d exam the co	nination, ourse	project	nd Diffe	erentia	

	Teaching content is summarised in a script accompanying the lecture	<u>)</u> .
12	Language:	
	German	

Nur	merical	Methods	for Large Spa	arse S	yste	ms of E	Equatio	ns	SPM	
	ntification ber:	Workload	: Credits:	Stud	y sem		Frequen offer	cy of the	Durat	ion:
118		240 h	8	5th sem	or 6th 1.				1 ser	nester
1	Course:		Planned grou	p sizes	Scop	pe	Actual contact time / classroom teaching		Self-study	
	Lecture		60 students		0	SCH	0	h	0	h
	Sem. les	ssons	30 students		4	SCH	60	h	180	h
	Exercise	9	20 students		0	SCH	0	h	0	h
	Practical or		15 students		0	SCH	0	h	0	h
	seminar									
	Supervised self-		60 students		0	SCH	0	h	0	h
2	study Learning outcomes/competences:									
3		sparse matrices. They have an overview of fast iterative methods for sparse linear systems and implement well-known solution techniques (e.g. finite difference and finite element method) for specific applications.								
	•	Irreducibl Storage for Triangular Band and Gauss elir Iterative	y and incidence e matrix and p ormats of spar r, tridiagonal, t envelope met mination (Fill-in solvers (preco	ropert se vec olock, hods. <sup>-</sup> n; inco ndition	ties of tors a band, The Complet ning, c	underland mat Hesse Luthill-Nate LU fa Converg	ying gra rices nberg, s IcKee al actoriza ence)	aph skyline n gorithm tion)		
4	Forms o	f teaching:								
	Sem. le	essons								
5		ation requir	ements:							
	Formal:									
	Content	_	dules:	2 12						
6	Forms o	f assessme	39 Linear Algel	Jia						
0			ten examinatio	n coi	mhine	d evan	nination	nroject	work c	ıral
			xamination ac					, project	. WOIN, C	лаі
7			award of credit			, cric cc	, ui sc			
•	•	examinat		,						
8	Applicat	ion of the r	nodule (in the fo	ollowing	g study	y progra	immes)			
9	Importa	nce of the	grade for the fin	al grad	le:					
10		ing to BRP								
10	Prof. D		r: . Svetozara Pe	trova						
	Other in	c								
11		formation:	announced at	_						

12	Language:
	German

Lecc Ser Exe Pra sen Sup Study Lea The pair The diff and Ser Ser Ser For Cor Ser Ser Ser Ser Ser Ser Ser Ser Ser Se	rics o	f Partial	Differential E	quati	ons				NPDG	ìL
Lecc Ser Exe Pra sen Sup stude The diff and Ser Core Ser For Core Ser		Workload	: Credits:	Stud	y sem	ester:	Frequenc	y of the	Duratio	on:
Lecc Ser Exe Pra sen Sup Study Lea The pair The diff and Ser Ser Ser For Cor Ser Ser Ser Ser Ser Ser Ser Ser Ser Se		240 h	8	5th sem	or 6th	n			1 sem	ester
Exe Pra sen Sup stud 2 Lea The diff and 3 Cor For Cor For Cor Par Mo App App accorded	ourse:		Planned group	p sizes	Scop	oe	Actual of time / classroot teaching	om	Self-stu	ldy
Exempra sen Supstual The difficance of Par For Core and App App App and App App and App App and App and App App App and App App App and App App App App App App App App App Ap	cture		60 students		0	SCH	0	h	0	h
Prasen Sup stud Lea The pai The diff and  Cor  For Cor  For Cor  App App App App App App App App App A	em. les	sons	30 students		4	SCH	60	h	180	h
sen Sur student Sur student Sur student Sur student Sur student Sur s	ercise		20 students		0	SCH	0	h	0	h
Sur study and a local study an	actical	or	15 students		0	SCH	0	h	0	h
student Studen	<u>minar</u>								0	4
For Selection Con Con Con Con Con Con Con Con Con C		ed self-	60 students		0	SCH	0	h	0	h
The pair The diff and S Core Se Par For Core Mo S App App S		outcomes	/competences:							
For Sell For Con	partial differential equations. They know the different types (elliptic, hyperbolic and parabolic) of partial differential equations and can analyse them with regard to numerical solvability and error behaviour as well as select suitable procedures.									
Sell For Con Tell examples App App and according to the control of	<ul> <li>Types of partial differential equations</li> <li>Application of partial differential equations</li> <li>Finite difference method</li> <li>Finite elements method</li> <li>Finite volume method</li> </ul>									
Sell For Con Tell examples App App and according to the control of		teaching:	ristics procedur							
For Con	em. le:	_								
For Telexa Mo App App acc	rticipa	tion requir	ements:							
For Telexa Mo Mo App App App acc	rmal:									
Telexa Pre Mo B App App Imp	ontent:	Alg Equ Mo 104 115	owledge of the ebra (1139), uations (1043) dules: 03 Analysis; 43 Differential I 39 Linear Alget 36 Numerical M	Nume Equat ora;	rical ions;	Mathe		•	•	
example exampl	rms of	assessme								
Pre Mo B App App Imp			ten examinatio xamination aco					project	work, o	ral
Apr Ap Imp acc	erequi	site for the	award of credit			,				
Ap Imp	<u>odule</u>	examinat	ion pass							
Imp aco			module (in the fo	llowing	g study	y progra	ammes)			
acc			atics (B.Sc.) grade for the fina	al arad	Δ'					
	-	ng to BRP	-	ai yi au	c.					
	odule c	oordinato	:							
			rnhard Bachma	nn						
-		ormation:	announced at	the b	ain-	ing of t	ho 00	_		

12	Language:
	German

Nur	merical	Math	emat	ics						NUM	
	ntification ber:	Work	load:	Credits:	Stud	y sem	ester:	Frequence offer	y of the	Duratio	on:
118		360	h	12	3rd	sem.		Annual (Winter	)	2 sem	esters
1	Course:			Planned group	o sizes	Scop	pe	actual of time / classroot teachin	om	Self-study	
	Lecture			60 students		0	SCH	0	h	0	h
	Sem. les	ssons		30 students		8	SCH	120	h	240	h
	Exercise	)		20 students		0	SCH	0	h	0	h
	Practica seminar	ar		15 students		0	SCH	0	h	0	h
	Supervis study			60 students	60 students 0 SCH 0 h						h
2	_			competences:							
	possible	The students are familiar with the most important numerical algorithms and their possible applications and can handle numerical problems and estimate the errors of numerical calculations.									
3	Content	s:									
	•	Eleme linear regres equat Eigen	entary syste ssion ions value	interpolation, matrix opera ems of equation analysis, itera problems, ve tion algorithm	ntions ons, L ative s ctor it	, matı U dec solutio eratio	rix norr ompos on of la on and	ns. ition, QR rge linea inverse i	decomp r syster	oosition, ns of	
4	Forms o	f teach	ning:	cion aigonemi	B, LO	aria Ç	zix aige	711011111			
	Sem. le										
5	Participa	ition r	equire	ments:							
	Formal:										
	Content	:	seme Mode 1003 1098 1139	wledge of the esters ules: 3 Analysis; 3 Principles of 9 Linear Algeb 5 Software La	Compora;				i the fir	st tWO	
6	Forms o		ssmen	t:							
				en examinatio	•				project	work, o	ral
	examin	ation	or exa	amination acc	compa	nying	the co	ourse			
7	Module	exam	inatio								
8				odule (in the foics (B.Sc.)	llowing	j study	/ progr	ammes)			
9	Importa accordi		_	rade for the fina	al grad	e:					
10	Module (	coordi	nator:								
				hard Bachma	nn						
11		ıre wi	ll be a	announced at the beginning of the course.							

Language:
German

•	ject-Ori	ented	Progr	amming						ООР	
	ntification nber:	Work	load:	Credits:	Stud	y sem	ester:	Frequen	cy of the	Durat	ion:
118		150	h	5	3rd	sem.		Annual (Winter	-)	1 ser	nester
1	Course:			Planned group	p sizes	Scop	pe	Actual contact time / classroom teaching		Self-study	
	Lecture		(	60 students		0	SCH	0	h	0	h
	Sem. les	ssons		30 students		2	SCH	30	h	45	h
	Exercise	5	20 students			0	SCH	0	h	0	h
		Practical or seminar		15 students		2	SCH	30	h	45	h
	Supervi: study		f- (	60 students		0	SCH	0	h	0	h
2		outco	mes/co	mpetences:		L	<u> </u>				
3	Content Elemer Function function and class	maste n an o s: ats of a param ss meth	r techni bject-or an objectoading, neters, do	ques of proje riented progra ect-oriented references, d classes, meth- ronamic memo	progr lefault ods, ob	ammi param ojects,	ing lan neters, constructions	<b>guage</b> variable t uctors, de allow/dee	ypes, typ estructors ep copying ods, hiera	e declara , class v g, copy rchy of c	ation of ariables
	inherita	nce, m	ultiple i	nheritance, vi xception hand	irtual n	nethod	ds, dyna	amic bind	ing, polyr	norpnisi	ns,
4	inheritai virtual b	nce, m pase cla	ultiple in asses, e	nheritance, vi	irtual n dling, i	nethod nput a	ds, dyna and outp	amic bind out	ing, polyr	norpnisr	ms,
4	inheritai virtual b	f teach	ultiple in asses, e ning: s with p	nheritance, vi xception hand practical trai	irtual n dling, i	nethod nput a	ds, dyna and outp	amic bind out	ing, polyr	morpnisr	ms,
	Forms of Sem. le Participa	f teach	ultiple in asses, en asses	nheritance, vi xception hand practical trai ents:	irtual n dling, i	nethod nput a	ds, dyna and outp	amic bind out	ing, polyr	norpnisr	ns,
	Forms of Sem. le	f teach	ultiple in asses, en asses	practical trailents:	irtual n dling, i ning a	nethoonput a	ds, dyna and outp oject v	amic bind but vork	ing, polyr	norpnisr	ns,
5	Forms of Sem. le Participa	f teachessons	ultiple in asses, en asses	practical trainents:  Principles of	irtual n dling, i ning a	nethoonput a	ds, dyna and outp oject v	amic bind but vork	ing, polyr	norpnisr	ns,
5	Forms of Sem. letter Formal: Content Forms of Term p	f teachessons ation re f asses	ning: s with pequirem  Modul 1098 ssment: writter	practical trainents:  Principles of	ning a	nd producer	oject v	work  ce  mination,			
	Forms of Sem. le Participal Content Term pexamin Prerequi	f teachessons ation reapper, ation isite fo	ning: swith pequirem  Modul 1098 ssment: writter or exai	practical trai ents: Principles of mexamination ward of credit	ning a	nd producer	oject v	work  ce  mination,			
6	Forms of Sem. In Participal Contents  Forms of Term poly examinal Prerequipment Module	f teachessons f assessaper, ation isite fo	ning: swith pequirem  Modul 1098 ssment: writter or examination	practical trainents:  Principles of mexamination according and of credit pass	ning a	nd producer	oject v	work  ce  mination, ourse			
5	Forms of Sem. In Participal Formal: Content Forms of Term poly examine Prerequest Module Applicate Point of the poly of the po	f teachessons f assessation reaction reaction reaction isite for examinon of the second secon	ming: s with pequirem  1098 ssment: writter or examination the model	practical trainents:  Principles of mexamination according to the pass dule (in the formation the following the pass)	ning a	nd producer	oject v	work  ce  mination, ourse			
6	Forms of Sem. let Participal Formal: Content Forms of Term presequence Module Applicat Applicat Importal	f teachessons f assessation re appear, ation isite fo exam ion of the	ning: s with pequirem  Modul 1098 ssment: writter or exai r the av inatior the modul the gra	practical trainents:  Principles of the examination according to the pass dule (in the fors (B.Sc.))  de for the finalents (b.Sc.)	ning a  Compon, concompa points	nd producer mbine in ying :	Science de exar	vork  ce mination, ourse ammes)			
5 6 7 8	Forms of Sem. let Participal Formal: Content Forms of Term presequence Module Applicat Applicat Importal	f teachessons ation re aper, ation isite fo exam ion of to Math nce of ing to	ming: s with pequirem  Modul 1098 ssment: writter or exau r the avaination the modul the gra BRPO of	practical traients:  Principles of mexamination according to grant of credit pass dule (in the forest (B.Sc.)	ning a  Compon, concompa points	nd producer mbine in ying :	Science de exar	vork  ce mination, ourse ammes)			

11	Other information:
	Literature will be announced at the beginning of the course. Teaching content is summarised in a script accompanying the lecture.
12	Language:
	German

Оре	erations	Res	earch							OR	
	ntification ber:	Work	cload:	Credits:	Stud	y sem	ester:	Frequenc	y of the	Durati	ion:
118		240	h	8	5th sem	or 6tl 1.	า			1 semester	
1	Course:			Planned grou	p sizes	Scop	oe	Actual of time / classro teachin	om	Self-stu	udy
	Lecture			60 students		0	SCH	0	h	0	h
	Sem. les	ssons		30 students		4	SCH	60	h	180	h
	Exercise	3		20 students		0	SCH	0	h	0	h
	Practica seminar			15 students		0	SCH	0	h	0	h
	Supervi study			60 students		0	SCH	0	h	0	h
2				ompetences:							-
	Resear Models case st	ch (O and r udies	R) witl netho	e problems from the help of ds of OR, devivaluate them	suitat ⁄elop (	ole to	ols .				
3	Content	s:									
	•	Mode	lling, s	olution findir	ng and	l inter	pretat	ion as we	ell as sei	nsitivity	•
				inear optimis						•	
				res and applic				c, combir	atorial,	stochas	stic,
				multicriteria (							
				res of decisio		_	theor	У			
				tive decision							
				res of the pre	eceder	nce dia	agram	method a	and reso	ource pla	anning
		-	e mod								,
				nt of decision	ı supp	ort m	odels f	or operat	ional pr	oblems	(case
		studie									
4	Forms o		_	active eversi	ico co:	mnon	onto				
5	Participa			active exerci	seco	проп	ents				
5	Formal:	acion i	equil ci	nenes.							
	Content	•	Modu	ıles:							
				Linear Optir	nisatio	on					
6	Forms o	f asse									
	Term p	aper,	writte	en examinatio	n, co	mbina	tion ex	kaminatio	n, proje	ct work	or
	oral ex			- 3	,				. 1 - 3 -		
7				ward of credit	points	:					
	Module										
8	Applicat	ion of	the mo	dule (in the fo	llowing	g stud	y progra	ammes)			
	Applied	l Math	nemati	ics (B.Sc.)							
9	Importa accord			ade for the fin	al grad	le:					
10	Module	coordi	nator:								
-	Prof. D										
11	Other in										
	Literat	ure wi	ll be a	nnounced at	the b	eginn	ing of t	he cours	e.		
	Teachi	ng co		s summarised						ture.	
12	Languag										
	Germar	1									

Par	tial Diff	erential	Equations						PDGI	-
	ntification ber:	Workload	d: Credits:	Stu	dy sem	ester:	Frequenc offer	y of the	Durat	ion:
119	1	240 h	8	5th ser	or 6tl n.	า			1 sen	nester
1	Course:		Planned grou	p size:	s Scop	ре	Actual of time / classroot teaching	om	Self-st	ıdy
	Lecture		60 students		0	SCH	0	h	0	h
	Sem. les	ssons	30 students		4	SCH	60	h	180	h
	Exercise	;	20 students		0	SCH	0	h	0	h
	Practica seminar		15 students		0	SCH	0	h	0	h
	Supervis	sed self-	60 students		0	SCH	0	h	0	h
2	Learning outcomes/competences:  The students master the most important methods for solving partial differentions. The application of existence, uniqueness and dependency theoretical interest is important as the concrete finding of solutions. They will be able to the theoretical contents to practice-relevant partial differential equations.							orems is to apply		
3	6									
	<ul> <li>Type classification</li> <li>Existence and uniqueness theorems</li> <li>Characteristics of a differential equation</li> <li>Initial and boundary value problems</li> <li>Green's formula and functions</li> </ul>									
4	Forms o Sem. le	f teaching essons	:							
5	Participa	ation requi	irements:							
	Formal:									
	Content	10 10 11 11	odules: 103 Analysis; 143 Differential 139 Linear Algel 186 Numerical N	ora;		S				
6	Term p		ent: tten examinatio examination ac					n, proje	ect work	c, oral
7	Prerequ	isite for th	e award of credit tion pass			,				
8	Applicat	ion of the	module (in the formatics (B.Sc.)	llowin	g stud	y progra	ammes)			
9	Importa		grade for the fin	al gra	de:					
10	Module	coordinato								
11		formation								
11	Literati	ure will be	e announced at						hal+	
										ro
12	Languag		erial is summari	seu ii	i a sci	ірі іпа	t accomp	Janies t	ne lectu	16

Priı	nciples	of Physics	and Engine	ering					PTG		
	ntification	Workload:	Credits:	Stud	y sem	ester:	Frequen	cy of the	Durati	on:	
num 120	nber: 13	240 h	8	2nd sem.			offer Annual (Summe	er)	2 sen	2 semesters	
1	Course:		Planned grou	Scope		Actual contact time / classroom teaching		Self-study			
	Lecture		60 students		0	SCH	0	h	0	h	
	Sem. les	ssons	30 students		8	SCH	120	h	120	h	
	Exercise	<u> </u>	20 students		0	SCH	0	h	0	h	
	Practica		15 students		0	SCH	0	h	0	h	
	seminar	•	25 564456			00			,		
	Supervi	sed self-	60 students		0	SCH	0	h	0	h	
2	study Learning	outcomes/	competences:					1			
3	mather The stutechnic Content Introdutield:	maticians. udents know al field. s: uction to the fundament physics? Meatics: For Direct currelectrical ecoil, Kirchle (branch current), Kirchle (br	e professional cals of physic odelling and precent and direct and direct mesh cals body kine and AC current apparent rect appare	e appl  s: His shysic enera ct volt harge ms, sei urrent circu matic nt: Fu esistar pplica ogy, t	tory of all qualiforces and ndamonce, actions:	ns of nathema of physical para elent, voind para ysis). overnenation of the para kinema entals ctive, resident als ctive, resident als	nathema sticians i sics. Wh s, work a ms and c quantiti ltage, re allel con nts, mov atics of i and com reactive voltage s, filter	n the ph at is sc nd energi entres des and desistance nection, la relative in plex AC and appa and cu	ysical-t ience? V gy. of mass. compone c, capaci linear ne moveme voltage arent po irrent s semicon	echnical What is ents in etworks erdinate ent). theory, ower. ources, nductor	
4	Sem. le from th	<u>ne natural s</u>	olemented wit ciences and t			y stuc	lents on	interest	ing ques	stions	
5		ation require	ments:								
	Formal: Content										
	I I ANTANT										
6			nt.								
6	Forms o	f assessmer	it: en examinatio	ח כפי	mhine	d evan	nination	nroiect	work o	ral	

7	Prerequisite for the award of credit points:
	Module examination pass
8	Application of the module (in the following study programmes)
	Applied Mathematics (B.Sc.)
9	Importance of the grade for the final grade:
	according to BRPO
10	Module coordinator:
	Prof. Dr. rer. nat. Jörg Horst
11	Other information:
	Literature will be announced at the beginning of the course.
	Teaching content is summarised in a script accompanying the lecture.
12	Language:
	German

Pra	ctical Pi	roject / Ir	nternship						PRS	
	ntification ber:	Workload:	Credits:	Stud	y sem	ester:	Frequence	y of the	Duratio	on:
120	7	450 h 15 7th sem. each semeste		mester	12 we	eks				
1	Course:		Planned group	sizes	Scop		Actual time / classro teachin	om	Self-stu	dy
	Lecture		60 students		0	SCH	0	h	0	h
	Sem. les	ssons	30 students		0	SCH	0	h	0	h
	Exercise		20 students		0	SCH	0	h	0	h
	Practica seminar		15 students		2	SCH	30	h	420	h
2	Supervis study		60 students /competences:		0	SCH	0	h	0	h
	and sk	ills they hoces they	ne study progra nave acquired have had in	l in t	heir p	previou	is studie	es and	reflect c	on the
3	Content	s: O §16-21								
4	Forms o	f teaching:	g to SPO §20							
5		ation require								
	Formal:	see	SPO §16							
	Content		t.							
6		f assessme s examinat								
7			award of credit	points						
,	-	examinati		۵ی	-					
8			nodule (in the fo	llowing	study	y progra	ammes)			
			tics (B.Sc.)							
9		_	rade for the fina	_						
			O or SPO if ung	gradeo	d elec	tive su	bject			
10		coordinate								
	ı Dı. IIIdl	coordinator:								
11		coordinator: h. Elke Ko formation:								
11		th. Elke Ko formation:								

Pro	ject Ser	minar							PRO	
	ntification nber:	Workload:	Credits:	Stud	y sem	ester:	Frequen offer	cy of the	Durati	on:
122	.6	150 h	5 4th c sem.		or 6th	า	onei		1 semester	
1	Course:		Planned group	p sizes		oe	time / classro teachi		Self-stu	ıdy
	Lecture		60 students		0	SCH	0	h	0	h
	Sem. les	ssons	30 students		0	SCH	0	h	0	h
	Exercise	<u> </u>	20 students		0	SCH	0	h	0	h
	Practical seminar		15 students		4	SCH	60	h	90	h
	Supervis study		60 students competences:		0	SCH	0	h	0	h
3	project Contents	results.	nd solve the presented the present the pre				-			
	which r	equire the	use of mathe						прасст	Selerie
4		f teaching:								
		work in sn								
5	Formal:	ition require	ments:							
	Content	· Raci	c knowledge a	accord	lina t	n the r	rohlem	areas off	ered	
6		f assessmer		JC COI C	anig co	o ciric p	, JUICITI	u. Cu3 011	Cica	
•			nt, project wo	rk or e	xamiı	nation	accomp	anying t	he cours	se
7	<u> </u>		award of credit					, ,		
		examination								
8			odule (in the fo	llowing	study	y progr	ammes)			
			ics (B.Sc.)	al a=a -l	0.1					
9	•	_	rade for the find or SPO if ung	_		tivesı	ıbiect			
10		coordinator:		g. aact			,			
-			nhard Bachma	nn						
11		formation:								
			announced at	the be	eginni	ing of t	he cour	se.		
12	Languag									
	German	l								

	tware L	ab 1								SWL	1
Ider	ntification	Workloa	ad:	Credits:	Stud	v sem	ester:	Freque	ncy of the	Durat	ion:
	ber:			0.00.00.	offer				2 4.1 4.1		
124	150 h			5	1st sem.					2 ser	nesters
1	Course:		PI	anned group	sizes	Scop	e	Actua time / classr teach	oom	Self-st	udy
	Lecture		60	) students		0	SCH	0	h	0	h
	Sem. les	ssons	30	) students		0	SCH	0	h	0	h
	Exercise		20	) students		0	SCH	0	h	0	h
	Practica seminar			5 students		4	SCH	60	h	90	h
2	Supervis study			) students		0	SCH	0	h	0	h
	acquire a suital	missing ble form	j knov	rk independ vledge, to p							
3			entals	of comput							
		Realisat spreads	ion of heet t	descriptive ool,	stati	stics	oroced	ures wi	th the he	lp of a	
4	• Forms o	Realisat spreads	ion of heet t ion an g:	descriptive ool, d presenta	stati	stics	oroced	ures wi	th the he	lp of a	
4	Forms o	Realisat spreads Realisat f teachin	ion of heet t ion an g: ct wo	descriptive ool, d presenta rk	stati	stics	oroced	ures wi	th the he	lp of a	
•	Forms o	Realisat spreads Realisat f teachin al, proje	ion of heet t ion an g: ct wo	descriptive ool, d presenta rk	stati	stics	oroced	ures wi	th the he	lp of a	
5	Forms of Practic Participal Formal:	Realisat spreads Realisat f teachin al, proje ation requ	ion of heet t ion an g: ct wo uireme	descriptive ool, d presenta rk	stati	stics	oroced	ures wi	th the he	lp of a	
•	Forms o Practic Participa Formal: Content Forms o	Realisat spreads Realisat f teachin al, proje ation requ : f assessr	ion of heet t ion an g: ct wo uireme ment:	descriptive ool, d presenta rk nts:	tion o	f proj	ects.				
5	Forms o Practic Participa Formal: Content Forms o Course	Realisat spreads Realisat f teachin al, proje tion requ  f assessr assessr	ion of heet to	descriptive ool, d presenta rk nts:	e statis	f proj	ects.				se
5	Forms of Practic Participals Formal: Content Forms of Course Prerequipment of the Preservation of the Pres	Realisat spreads Realisat f teachin al, proje ation requ : f assessr assessr isite for t	ion of heet to ion and g: ct word uiremed ment: ment, he awa	descriptive ool, d presenta rk nts:  project wor	e statis	f proj	ects.				se
5 6 7	Forms of Practic Participals Formal: Content Forms of Course Prerequipment Module	Realisat spreads Realisat f teachin al, proje ition requ f assessr assessr examin	ion of heet to ion and g: ct word uiremed ment: ment, he awaration	descriptive ool, d presenta rk nts:  project wor ard of credit pass	e station o	f proj	ects.	accom			se
5	Forms of Practic Participals Formals Content Forms of Course Prereques Module Applicat	Realisat spreads Realisat f teachin al, proje stion requ  f assessr assessr isite for t examin ion of the	ion of heet to ion and g: ct word uiremed ment: ment, he awaration e module	descriptive ool, d presentark nts:  project worderd of credit pass lie (in the following pass)	e station o	f proj	ects.	accom			se
5 6 7 8	Forms of Practic Participal Formal: Content Forms of Course Prereque Module Applicat Applied	Realisat spreads Realisat f teachin al, proje ation requ  f assessr assessr isite for t examin ion of the	ion of heet to ion an g: ct word uiremed ment: ment, he awaration is modumatics	descriptive ool, d presentark nts:  project word of credit pass le (in the fol (B.Sc.)	e statis tion o	f proj	ects.	accom			se
5 6 7	Forms of Practic Participal Formal: Content Forms of Course Prereque Module Applicat Applied Importa	Realisat spreads Realisat f teachin al, proje tion requ  f assessr assessr isite for t examination of the Mather	ion of heet to ion and g: ct wood uireme ment: ment, he award ation is emodumatics e grad	descriptive ool, d presentark nts:  project word of credit passule (in the fole (B.Sc.) e for the final	e statis tion o	stics proj	nation	accom			se
5 6 7 8	Forms of Practic Participal Formal: Content Forms of Course Prereque Module Applicat Applied Importal according Procession of the Present Pres	Realisat spreads Realisat f teachin al, proje tion requ  f assessr assessr isite for t examination of the Mather	ion of heet to ion and g: ct word wiremed ment: ment, he award ation e modumatics e grad RPO or	descriptive ool, d presentark nts:  project word of credit pass le (in the fol (B.Sc.)	e statis tion o	stics proj	nation	accom			se
5 6 7 8	Forms of Practic Participal Formal: Content Forms of Course Prereque Module Applicat Applied Importation according Module Opipl W	Realisat spreads Realisat f teachin al, proje ation requ : f assessr assessr isite for t examination of the Mather nce of th ing to Br coordinat firt.Math	ment: ment, he awa ation   e modumatics e grad RPO or or: n. Ralf	descriptive ool, descri	e statis tion o	stics proj	nation	accom			se
5 6 7 8	Forms of Practic Participal Formal: Content Forms of Course Prereque Module Applicat Applied Importation according Module of Dipl Worther in Practical Programme Presentation of the Pr	Realisat spreads Realisat f teachin al, proje ation requ  f assessr assessr isite for t examination of the Mather nce of the ing to Br coordinat formation	ion of heet to ion and g: ct word uiremed ment: ment, he award ation per modumatics e grad RPO or cor: n. Ralfin:	descriptive ool, d presentark nts:  project word of credit passule (in the fole (B.Sc.) e for the finare SPO if ung Derdau	e statis tion o	stics proj	nation r progra	accom ammes) bject	panying t		se
5 6 7 8 9	Forms of Practic Participal Formal: Content Forms of Course Prereque Module Applicat Applied Importation according Module Other in Literatic	Realisat spreads Realisat feachinal, projection required fassess assess fon of the Mathernce of the Ing to Broordinat formation ure will to the spread for t	ment: ment, he awa ation e modu matics e grad RPO or or: n. Ralf	descriptive ool, d presentark nts:  project word of credit pass lie (in the fole (B.Sc.) e for the finare SPO if ungo Derdau ounced at the ool of the fole outcomes outcomes outcomes of the fole outcomes of the fole outcomes outcome	e statistion of the state of th	stics proj	nation r progra	accompammes) bject he cou	panying t	he cour	
5 6 7 8 9	Forms of Practic Participal Formal: Content Forms of Course Prereque Module Applicate Applicate Applied Importation according Module of Dipl Wolfer in Literature Teaching	Realisat spreads Realisat feachinal, projection required assessmassessmassessmassessmaster for the feaching to BF coordinate formation of the feaching to BF coordinate will be grounded attention is a feaching to BF coordinate formation in the feaching to BF coordinate formation is a feaching to BF coordinate formation in the feaching to BF coordinate formation is a feaching to BF coordinate formation in the feaching to BF coordinate for	ment: ment, he awa ation e modu matics e grad RPO or or: n. Ralf n: oe ann is sun	descriptive ool, d presentark nts:  project word of credit passule (in the fole (B.Sc.) e for the finare SPO if ung Derdau	e statistion of the points lowing the bear scrip	stics proj	nation r progra	accompammes) bject he cou	panying t	he cour	

Sof	tware L	ab 2								SWL2	2
	ntification ber:	Work	load:	Credits:	Stud	y sem	ester:	Frequenc	y of the	Duratio	on:
124		150 l	า	5	3rd or 4th sem.		Annual (Winter)		2 semesters		
1	Course:		F	Planned group	sizes	Scop	oe	Actual of time / classrooteaching	om	Self-stu	ldy
	Lecture		6	0 students		0	SCH	0	h	0	h
	Sem. les	ssons	3	30 students		0	SCH	0	h	0	h
	Exercise	9	2	0 students		0	SCH	0	h	0	h
	Practica		1	.5 students		4	SCH	60	h	90	h
	seminar Supervi		f- 6	0 students		0	SCH	0	h	0	h
2	study			mpetences:							
	suitable They a	e softv re able e missi	ware(e e to wo ng kno	AB, Python .g. SPSS, R) ork on tasks wledge, to p form.	). s set i	n pro	jects	independ	ently ar	nd in gro	oups, to
3	Content	·									
	Accom	Equat mathe panyir	ions: W matica ng the r	ng to the mo orking on nu Il software nodule Stoc oroject.	ımeric	al me	thods	with the	help of		
4	Forms o	f teach	ing:								
	Practic										
5	Participa	ation re	quirem	ents:							
	Formal: Content		Numer Stock	ipation in the ical Mather astics (1251	natics				Equatio	ns (1143	3),
6	Forms o									•	
_	Course	asses	sment,	project wo	rk or e	xamiı	nation	accompa	anying t	ne cours	se
7	Module	exam	ination								
8				ule (in the fos (B.Sc.)	llowing	g study	y progr	ammes)			
9	Importa	nce of	the grad	de for the fina or SPO if uno	_		tivesi	ıhiect			
10	Module			T JEO II UIIQ	<sub>J</sub> i auel	ا حاحد	uvest	וטופננ			
10	DiplW	/irt.Ma	ith. Rali	f Derdau							
11	Other in Literat			nounced at	the be	eginni	ina of t	the cours	e.		
	Teachin workst	g conte ation is	nt is su	mmarised in ible per part	a scrip	t acco				ne comp	uter
12	Languag										
	Germar	1									

Sto	chastic	s								sто	
Iden num	itification	Work	load:	Credits:	Stud	y sem	ester:	Frequenc offer	y of the	Duratio	on:
125	51 360 h  Course:			12	3rd sem.			Annual (Winter)		2 semesters	
1	Course:		P	lanned group	sizes	Scop	e .	Actual of time / classroot teaching	om	Self-stu	dy
	Lecture		6	0 students		0	SCH	0	h	0	h
	Sem. les	ssons	3	0 students		8	SCH	120	h	240	h
	Exercise	)	2	0 students		0	SCH	0	h	0	h
	Practica seminar		1	5 students		0	SCH	0	h	0	h
	Supervi: study	sed se		0 students npetences:		0	SCH	0	h	0	h
3	The studescrip models hypoth Content	udents tive a , anal esis te	master nd infer yse ran ests.	r the basic prential statis dom variable tatistics: bas	tics. T	They a d carr	re abl	e to set urandom e	ıp simple xperime	e stocha ents and	
	•	value: measi analy: Proba theor condii proba and co distrib Induc interv tests,	s, meanures); no sis) bility the side tional point bility montinuo bution), tive state goodne	rical distribusures of distribusures of distribution of the concepts of the conditional atistics: Sapothesis tesess of fit tesesures of distributions of the conditional atistics: Sapothesis tesess of fit tesesures of the conditional atistics: Sapothesis tesess of fit tesesures of the conditional atistics: Sapothesis tesess of fit tesesures of the conditional atistics: Sapothesis tesesures of the conditional atistics of the conditional atistics of the conditional atistics.	lispers datas lamer (ran indep ombin ons, e distri mpling sting (	sion, sets ( ntals dom ende atoric speci bution g sta includi	mome correlated of me proce nce, res, specially un ns, liminatistic, ding pa	ents, qua ation, reginals asure thess, ever andom vicial distribition ivariate a t theorer point e arametric	antiles, ression and ression and responding the protection mand multing stimatics one are	concentand time and integrability (), elemented () ivariate on, conf	tration series gration space, entary iscrete normal
4		essons	with a	ctive exercis	se cor	npone	ents				
5	Participa Formal:	ation re	equireme	ents:							
	Content		1139 L 1246 S	es: Analysis; Linear Algeb Software Lal							
6		aper,	written	examination					project	work, or	al
7	Prerequ	isite fo	r the aw	nination acc ard of credit			the c	ourse			
			ination								
8	Applied	l Math	nematics	ule (in the foles (B.Sc.)			/ progr	ammes)			
9	Importa accord		_	le for the fina	ıl grad	e:					

10	Module coordinator:
	Prof. Dr. rer. nat. Claudia Cottin
11	Other information:
	Literature will be announced at the beginning of the course. Teaching content is summarised in a script accompanying the lecture.
12	Language:
	German

iec	hnical E	nglish							ENG	
	ntification nber:	Workload:	Credits:	Stud	y sem	ester:	Frequenc offer	y of the	Durati	on:
	1083   150 h 1   Course:		5	5th	sem.		Annual (Winter)		2 semester	
1	Course:		Planned group	sizes	Scop	oe .	Actual of time / classroot teaching	om	Self-stu	ıdy
	Lecture		60 students		0	SCH	0	h	0	h
	Sem. le	ssons	30 students		4	SCH	60	h	90	h
	Exercise	9	20 students		0	SCH	0	h	0	h
	Practica seminar		15 students		0	SCH	0	h	0	h
		sed self-	60 students		0	SCH	0	h	0	h
	th - So co - M	neir professi ocial compe	etence: they on, especially	develo	op sei glish-	nsitivity	y to diffe	rences	in interd	cultural
	sp as - Pe to	peaking and ssessment. ersonal com managing	ormation and in writing The authentic Eng	l pres Γhey e y sho	sent t establ w Eng	hem s ish wid lish flu	shortly a erconte	n spec nd con xts and	ialist te icisely b make a	oth in critical
3	Content - St - TI pr - TI pr - TI	eaking and seessment. ersonal como managing managing es: tudents carries masterocesses; mechanisms; 0). hey posses tching a to	ormation and in writing The	icipate opera nary s uct;	e in inevant	ternati termi dimer s; auto	ency and onal conincions and omated s	ferences (e.g. d shap systems	ialist te icisely b make a active ap s. manufaces; forces and Ir gs and t	cturing es and adustry
3	Content - St - TI pr m 4 TI pi po Forms o	eaking and seessment. ersonal como managing managing tudents care hey masterocesses; mechanisms; 0). hey posses tching a tosters; acae of teaching:	primation and in writing. The petence: The authentic Engineering the mathematical properties of sinterdiscipling echnical produced by the properties of the properties of the properties of the properties of the produced by	icipate opera nary s uct;	e in in evant tions; terials	ternati termi dimer s; auto	onal continology asions anomated sussing	ference: (e.g. d shap systems reading designi	ialist te icisely b make a active ap s. manufaces; forces and Ir gs and t	cturing es and adustry
	Content - St - TI pr m 4 TI pi po Forms of	eaking and seessment. ersonal como managing managing tudents carbies masterocesses; mechanisms; 0). hey posses tching a tosters; acapt teaching:	primation and in writing. The petence: The authentic Engineering the mathematical properties of the chnical production of the properties of the chnical production of the properties of the chnical production of the chnical production of the chnical and grant)	icipate opera nary s uct;	e in in evant tions; terials	ternati termi dimer s; auto	onal continology asions anomated sussing	ference: (e.g. d shap systems reading designi	ialist te icisely b make a active ap s. manufaces; forces and Ir gs and t	cturing es and adustry
4	Content - St - TI pr m 4 TI pi po Forms of Sem. le project Participa Formal:	eaking and seessment. ersonal compound of managing of managing the master ocesses; muchanisms; and the control of teaching a top teaching a t	primation and in writing. The petence: The authentic Engineering the matical properties of the propert	icipate opera of main nary s uct;	e in inevant tions; terials kills (mana	ternati ternati termi dimer s; auto	onal continuous and somated so	ference: (e.g. d shap systems reading designi	s. manufaces; force and Ir	cturing es and ndustry ference
4	Content - St - TI - TI - TI - pr - TI - pr - TI - pr - pr - pr - TI - pr - pr - TI - pr - pr - TI - pr	seaking and seessment. ersonal compound of managing of managing of managing of managing of master ocesses; mechanisms; o). The posses the posses of teaching a top sters; acaptes of teaching at the posses of teaching at the pos	premation and in writing. The petence: The authentic Engineerinathematical properties of sinterdisciplinathemic writing ividual and grant)  ments:  ular attendancish language irence Frame	icipate opera of main nary suct; coup w	e in in evant tions; terials (mana-	ternati ternati termi dimer s; auto	onal continuous onal continuou	ference: (e.g. d shap systems reading designi	s. manufaces; force and Ir	cturing es and ndustry ference

7	Prerequisite for the award of credit points:
	Passed semester project and written exam
8	Application of the module (in the following study programmes)
	Applied Mathematics (B.Sc.)
9	Importance of the grade for the final grade:
	according to BRPO
10	Module coordinator:
	Dr. phil. Anna Trebits
11	Other information:
	Literature will be announced at the beginning of the course. Textbook,
	additional materials, intranet self-study courses
12	Language:
	English

Ins	urance	Econo	mics							VEWL	_
	ntification Workload: Credits: Study semester: Frequency of the offer 73 150 h 5 4th or 6th							Duratio	on:		
127		150 h		5	4th sem		1	onei		1 sem	ester
1	Course:		PI	anned group	sizes	Scop	e '	Actual of time / classroot teaching	om	Self-stu	dy
	Lecture		60	0 students		0	SCH	0	h	0	h
	Sem. les	ssons	30	0 students		4	SCH	60	h	90	h
	Exercise	<del>)</del>	20	0 students		0	SCH	0	h	0	h
	Practica	lor	15	5 students		0	SCH	0	h	0	h
	seminar										
2	Supervi study			0 students		0	SCH	0	h	0	h
3	use in busines operati	privat ss feat ional st ds of i nies.	e and ures of ructure	of the varion company refinsurance es, account anagement	isk m com ing, e	nanag panie etc.) a	ement s (wit and ha	:. They under the second in th	indersta to orga erview	and the anisation of mode	special nal and els and
	•	Import manag Overvi interac Organi Legal b Detaile Accour	ance of ement ew of interest o	ic models refinsurance ndividual and particular and supervious into selections in the insurance of the insur	in the also sision concected compa	e cont ocial in ource of the ontrace busir anies	ext of nsurar es for i insura et ness lin	private and to ance and to ance industrial to ance industrial to ance industrial to ance insuficial to ance	nd corp heir de in procu stry irance	marcation (urement)	on and
4	Forms o		_	n project wo	ork						
5	Participa				JI K						
	Formal:	3.5.1.1.60									
	Content		Module 1099 P Mather 1251 S	rinciples of	_				nd Busir	ness	
6	Forms o										
				examinatio	-					assessm	ent,
	project	work,	oral ex	amination o	or exa	minat	ion du	iring the o	course		
7	-			ard of credit	points	:					
	Module										
8				ile (in the fol	liowing	study	/ progr	ammes)			
	Applied	ı Mathe	ematics	(B.Sc.)							

9	Importance of the grade for the final grade: according to BRPO or SPO if ungraded elective subject
10	Module coordinator:
	Prof. Dr. rer. nat. Claudia Cottin
11	Other information:
	Literature will be announced at the beginning of the course.
	Accompanying material is provided (e.g. short script and current professional
	articles).
12	Language:
	German

Ele	lective Module Mathematical Application Areas									WM		
	Identification number:		load:	Credits:	Study semester:			Frequency of the offer		Duration:		
132	1320		h	5		4th or 6th sem.		Annual (Summer)		1 semester		
1	Course:		f	Planned group sizes		Scope		Actual contact time / classroom teaching		Self-study		
	Lecture	Lecture		60 students			SCH		h		h	
	Sem. lessons		3	30 students			SCH		h		h	
	Exercise		2	20 students			SCH		h		h	
	Practical or seminar		-	15 students		0	SCH	0	h	0	h	
	Supervised self- study			60 students			SCH		h		h	
2	Learning outcomes/competences:											
3	Contents:											
4	Forms of teaching:											
5	Participation requirements:											
	Formal:											
	Content	:										
6	Forms o	f asse	ssment:									
7	Prerequisite for the award of credit points:											
8		Application of the module (in the following study programmes)										
		Applied Mathematics (B.Sc.)										
9	Importance of the grade for the final grade:											
10	Module coordinator:											
11		Prof. Dr. phil. Bernhard Bachmann Other information:										
12	Language: German											

Sul	Subject-Specific Elective Module										WM	
	Identification number:		load:	Credits:	Study semester:			Frequency of the offer		Duration:		
902	9027		h	8	5th sem	or 6th	1	each semester		1 semester		
1	Course:			Planned group sizes		Scope		Actual contact time / classroom teaching		Self-study		
	Lecture			60 students			SCH		h		h	
	Sem. lessons		,	30 students			SCH		h		h	
	Exercise			20 students			SCH		h		h	
	Practical or seminar			15 students		0	SCH	0	h	0	h	
	Supervised self- study			60 students			SCH		h		h	
2	Learning	g outco	mes/co	mpetences:								
3	Contents:											
4	Forms of teaching:											
5	Participation requirements:											
	Formal:											
	Content	:										
6	Forms o	f asse	ssment:									
7	Prerequisite for the award of credit points:											
8	Application of the module (in the following study programmes)  Applied Mathematics (B.Sc.)											
9	Importance of the grade for the final grade:											
10	Module coordinator:											
		Prof. Dr. phil. Bernhard Bachmann										
11	Other information:											
12	Language:											
	German											