#### Appendix A

Course schedule for the part-time combined study programme Mechanical Engineering

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

First semester	ECTS	SCH	L	ST	E	Р	Classroom teaching
Technical Documentation	5	4	2	_	1	1	24
Mathematics I	5	4	2	_	2	-	16
Engineering Mechanics I	5	4	2	_	2	_	16
Fundamentals of Industrial Computer	5	4	2	_	1	1	24
Science					'	'	27
Totals	20	16	8	-	6	2	80
Second semester	ECTS	SCH	L	ST	Е	Р	Classroom
							teaching
Physics	5	4	2	-	1	1	24
Mathematics II	5	4	2	-	2	-	16
Engineering Mechanics II	5	4	2	-	2	-	16
CAD	5	4	2	-	1	1	24
Totals	20	16	8	-	6	2	80
Third semester	ECTS	SCH	L	ST	Е	P	Classroom
Time Semester		0011	_	0.	_	•	teaching
Mathematics III	5	4	2	-	2	-	16
Engineering Mechanics III	5	4	2	-	2	-	16
Construction Elements I	5	4	2	-	1	1	24
Fundamentals of Electrical Engineering	5	4	2	-	1	1	24
Totals	20	16	8	-	6	2	80
Fourth semester	ECTS	SCH	L	ST	Ε	Р	Classroom
							teaching
Construction Elements II	5	4	2	-	2	-	16
Plastics Engineering	5	4	2	-	1	1	24
Industrial Management	5	4	2	-	2	-	16
Metal Engineering	5	4	2	-	1	1	24
Totals	20	16	8	-	6	2	80
Fifth semester	ECTS	SCH	L	ST	E	Р	Classroom
			_		_	-	teaching
Elective Project	5	4	2	-	2	-	16
Lightweight Materials	5	4	2	-	2	-	16
Thermodynamics	5	4	2	-	1	1	24
Production Engineering I	5	4	2	-	1	1	24
Totals	20	16	8	-	6	2	80
Sixth semester	ECTS	SCH	L	ST	Ε	Р	Classroom
							teaching
Industrial Control Technology	5	4	2	-	1	1	24
Fluid Mechanics and Flow Machines	5	4	2	-	2	-	16
Technical English	5	4	2	-	2	-	16
Production Engineering II	5	4	2	-	2	-	16
Totals	20	16	8	-	7	1	72
			_		_	_	

Seventh semester	ECTS	SCH	L	ST	E	Р	Classroom teaching
Fundamentals of Mechanical Process Engineering	5	4	2	-	2	-	16
Measurement and Control Technology	5	4	2	-	1	1	24
Compulsory Elective Module I	5	4	2	-	*	*	*
Compulsory Elective Module II	5	4	2	-	*	*	*
Totals	20	16					
Eighth semester	ECTS	SCH	L	ST	E	Р	Classroom teaching
Calculation and Simulation Technology in Industrial Production	5	4	2	-	2	-	16
Project Management	5	4	2	-	2	-	16
Compulsory Elective Module III	5	4	2	-	1	1	24
Compulsory Elective Module IV	5	4	2	-	1	1	24
Totals	20	16	8	-	6	2	80
Ninth semester	ECTS	SCH	L	ST	E	P	Classroom teaching
Quality Management	5	4	2	-	1	1	24
Bachelor Thesis	12	-	-	-	-	-	=
Colloquium	3	-	-	-	-	-	-
Totals	20	4	2	-	1	1	24

#### Legend:

L	= 100% study materials	+ 0% classroom teaching
ST and E	= 50% study materials	+ 50% classroom teaching
Р	= 0% study materials	+ 100% classroom teaching

 $<sup>\</sup>ensuremath{^{\star}}$  The extent of classroom teaching can be found in the respective compulsory elective modules.

Focus: Further Education	ECTS	SCH	L	ST	E	Р	Classroom teaching
CEM I: Diagnosis and Support	5	4	2	-	1	1	24
CEM II: Vocational Education I and Vocational Field Practical	5	4	-	-	2	ı	16
CEM III: Didactics of Technology	5	4	2	=	1	1	24
CEM IV: Vocational Education II	5	4	2	=	1	1	24
Totals	20	16	6	-	5	3	88

Focus: Production Technology	ECTS	SCH	L	ST	E	Р	Classroom teaching
CEM I: Production Management and Factory Organisation	5	4	2	-	2	-	16
CEM II: Production Automation and Digitalisation	5	4	2	-	2	-	16
CEM III: Plastics Production Process	5	4	2	-	1	1	24
CEM IV: Rapid Prototyping / Additive Manufacturing	5	4	2	-	1	1	24
Totals	20	16	8	-	6	2	80

Focus: Product Development	ECTS	SCH	L	ST	E	Р	Classroom teaching
CEM I: Product Risk Management	5	4	2	-	2	-	16
CEM II: Innovation Techniques	5	4	2	-	1	1	24
CEM III: Designing with Plastics	5	4	2	-	1	1	24
CEM IV: Rapid Prototyping / Additive Manufacturing	5	4	2	-	1	1	24
Totals	20	16	8	-	5	3	88

Additional module for the focus on further education: General Didactics and Orientation Practical

#### Legend:

L	= 100% study materials	+ 0% classroom teaching
ST and E	= 50% study materials	+ 50% classroom teaching
Р	= 0% study materials	+ 100% classroom teaching

#### Appendix B

#### Module catalogue

for the bachelor's degree study programme in Mechanical Engineering (part-time combined studies) of the Faculty of Engineering and Mathematics

#### Table of contents

General Didactics and Orientation Practical	14
Bachelor Thesis	16
Calculation and Simulation Technology in Industrial Production	17
Vocational Education I and Vocational Field Practical	19
Vocational Education II	20
CAD	21
Diagnosis and Support	22
Production Engineering I	24
Production Engineering II	26
Plastics Production Process	28
Fundamentals of Electrical Engineering	30
Fundamentals of Industrial Computer Science	31
Fundamentals of Mechanical Process Engineering	33
Industrial Management	35
Industrial Control Technology	36
Innovation Techniques	38
Colloquium	40
Designing with Plastics	41
Construction Elements I	42
Construction Elements II	44
Lightweight Materials	46
Mathematics I	47
Mathematics II	48
Mathematics III	49
Measurement and Control Technology	50
Physics	51
Product Risk Management	53
Production Automation and Digitalisation	54
Production Management and Factory Organisation	56
Project Management	57
Quality Management	59
Rapid Prototyping / Additive Manufacturing	61
Fluid Mechanics and Flow Machines	62
Didactics of Technology	64
Technical Documentation	65
Engineering Mechanics I	67
Engineering Mechanics II	68

Engineering Mechanics III	70
Technical English	71
Thermodynamics	72
Elective Project	74
Plastics Engineering	75
Metal Engineering	76

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Gen	eral Didac	tics and Orien	tation Practical						ADO	P	
Ident	ification per:	Workload:	Credits:	Study	semeste	er:	Frequency offer	of the	Durat	ion:	
4078		125 h	5	Add-	on modu	le	Annual (Winter)		1 sem	ester	
1	Course:		rrse: Planned group sizes Scope				Actual c / classro teaching		Self-study		
	Lecture		60 students		0	SCH	0	h	0	h	
	Tuition is	n seminars	30 students		0	SCH	0	h	0	h	
	Exercise		20 students		2	SCH	16	h	3	h	
	Practical	or seminar	15 students	students			106	h	0	h	
	Supervis	ed self-study	60 students		0	SCH	0	h	0	h	
3	n d a tt h a a o a tt Tre tt  Contents Genesis, theory, c Basic for Target gr	nderstand didac eighbouring dis idactics. re able to distin nese theoretical ave a basic kno ttempts and crit re able to transf rientation pract re able to critica o systematically effect on their o neoretical discu : subject areas/ta ritical-construct	ally question this ker elaborate them du wn developmental sssions about a varie	d discipli ected dida e planning tanding o m. on planni nowledge tring the o process a ety of exp	nes as we ctic theo g of teach f teachin ng and to to the control of the control of teach in the control of teach in the control of the contr	ries and hing-lea ag catego use the ify result on practide both topics.	models and rning proces ories, can appear for their of theories, of theory,	ject areas and to highlight sees. ply them in cown teaching the service of the se	the signification that the signification that the signification is the significant that the signification is the significant that t	anning ter in the astions and and	
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5	Formal:	tion requiremer	nts:								
6		assessment:	1								
7			oral examination rd of credit points:								
7	_		-								
				g study p	ogramm	es)					
8		Module examination pass  Application of the module (in the following study programmes)  Electrical Engineering (part-time combined studies) (B.Eng.); Mechanical Engineering (part-time									
8				d studies)	(B.Eng.)	); Mecha		2 (1			
9	combined Importan	d studies) (B.Er					-				
	Combined Important Percentag  Module (	d studies) (B.Er ice of the grade ge based on the	ng.); for the final grade: sum of credits of t				-				

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Daci	nelor Thesi	is							BA	
Ident numb	ification ber:	Workload:	Credits:	Study	/ semeste			Frequency of the offer		ion:
1291		300 h	12	9th se	em.		each seme	ster	1 sem	ester
1	Course:		Planned group si	Planned group sizes		;	Actual contact time / classroom teaching		Self-study	
	Lecture		60 students	0	SCH	0	h	300 h		
	Tuition in seminars		30 students		0	SCH	0	h	0	h
	Exercise		20 students		0	SCH	0	h	0	h
	Practical	or seminar	15 students		0	SCH	0	h	0	h
	Supervise	ed self-study	60 students		0	SCH	0	h	0	h
2	After succepractice-o	oriented task fro	petences: leting the bachelor to om their subject are e methods within a s	a, both i	n the sub	ject-spec				
	Contents:  The bachelor thesis is an independent scientific work from the subject area of the respective study programme with a description and explanation of its solution. It can be derived from current research projects at the university or from operational problems with an engineering character. It can also be carried out through an empirical investigation or through conceptual or design tasks or through an evaluation of existing sources. A combination of these is possible.									
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Iden num	tification	Workload:	Credits:	Study	semeste	er:	Frequency offer	of the	Durati	ion:
4075		125 h	5	8th se	sem.		Annual (Summer)	Annual		ester
1	Course:	'	Planned group si	zes	Scope		Actual co	assroom	Self-stu	ıdy
	Lecture		60 students		2	SCH	0	h	62.5	h
	Tuition ir	n seminars	30 students		0	SCH	0	h	0	h
	Exercise		20 students		2	SCH	16	h	46.5	h
	Practical	or seminar	15 students		0	SCH	0	h	0	h
	Supervise	ed self-study	60 students		0	SCH	0	h	0	h
3	• tra ar • as • ca th	ansfer the mode reas of applications seess the possible arry out a simulation approach poly the acquired poly knowledge	mulation technolog rn methods and pro on. e applications of si ation study with app ches for simulation d interdisciplinary and skills to concre	ocedures mulation propriate applicat methodo	of simulate simulate ions in indu	ustrial priion tools ndustrial competer	roduction in s, work on co l production.	order to use omplex prol	e them ser	nsibly.
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4	Forms of Learning		udy, classroom sess	sions in	the form	of exerc	cises			
5	Participat	tion requirement	ts:							
	Formal:	-								
	Content:	-								
6	Forms of	assessment: xamination, ora	l examination, term	n paper.	project v	vork, pre	esentation			
7			d of credit points:	r - F		, p1				
•		xamination pass								

8	Application of the module (in the following study programmes)
	Mechanical Engineering (part-time combined studies) (B.Eng.)
9	Importance of the grade for the final grade:
	Percentage based on the sum of credits of the graded modules according to RPO- BA §32
10	Module Officer:
	Prof. DrIng. Jürgen Sauser
11	Other information:
	-

Voc	ational Ed	ucation I	and voc	ational Field	a i ractica	lI					
lden num	tification ber:	Worklo	ad:	Credits:	Study	y semeste	er:	Frequency offer	of the	Duration:	
1046	125 h			5	7th se	em.		Annual (W	/inter)	1 sem	ester
l	Course:	1	P	Planned group sizes		Scope		/	ontact time	Self-stu	ıdy
	Lecture		6	0 students		0	SCH	classroom	m teaching h	0	h
		n seminars		0 students		0	SCH	0	h	0	h
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	Exercise		2	0 students		2	SCH	16	h	29	h
	Practical	or semina	r 1.	5 students		0	SCH	80	h	0	h
	Supervise	ed self	6	0 students		0	SCH	0	h	0	h
	Learning	outcomes	/competer	nces:		•					
	Students:										
	<ul> <li>are able to identify requirements for company and school educators and in this context understand vocational education as a profession.</li> <li>can describe the structures and forms of the vocational education system in Germany and consider the historical, educational and legal framework.</li> </ul>										
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	Contents  Contents  Contents  Contents  Contents  P  Forms of	cational ean describe istorical, ean describe istorical, eas concepts, so iscipline of objectives, ramework contributor rocesses of teaching:	ubject are f education structure of VET s and role f (vocation)	as a profession ctures and for all and legal from the seas and reseas and science, and system as in the VET nall) pedagog	on.  rms of the amework.  rch fields  ms of the system ical profes	of educa (Vocation	al educa	cience and v	in Germany	and con	as a sub-
3	Contents  Contents  Contents  Contents  Proms of Learning	coational ean describe istorical, ean describe istorical, eas concepts, so iscipline or objectives, ramework contributor rocesses of teaching:	ubject are f education structure of VET s and role f (vocation self-study)	as a profession ctures and for all and legal from the assand research and science, and system as in the VET	on.  rms of the amework.  rch fields  ms of the system ical profes	of educa (Vocation	al educa	cience and v	in Germany	and con	as a sub-
ļ	Contents Con	concepts, s iscipline o Objectives, ramework contributor rocesses of teaching:	ubject are f education structure of VET and role f (vocation self-study) ements:	as a profession ctures and for all and legal from the seas and reseas and science, and system as in the VET nall) pedagog	on.  rms of the amework.  rch fields  ms of the system ical profes	of educa (Vocation	al educa	cience and v	in Germany	and con	as a sub-
ļ	Contents  Conten	coational ean describe istorical, ean describe istorical ist	ubject are f education structure of VET s and role f (vocation self-study)	as a profession ctures and for all and legal from the seas and reseas and science, and system as in the VET nall) pedagog	on.  rms of the amework.  rch fields  ms of the system ical profes	of educa (Vocation	al educa	cience and v	in Germany	and con	as a sub-
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5	Contents	cational ean describe istorical, established istorical, established istorical, established istorical, established istorical, established istorical, established istorical in the contributor frocesses of teaching:  units for stablished istorical interest in the contributor requires assessment examination.	ubject are f education structure of VET s and role f (vocation self-study ements:	as a profession ctures and for all and legal from the seas and reseas and science, and system as in the VET nall) pedagog	on.  rms of the amework.  rch fields  ns of the system ical profes  essions in	of educa (Vocation	al educa	cience and v	in Germany	and con	as a sub-
5	Contents  Contents  Contents  Contents  Contents  Prorms of Learning Participa Formal: Content: Forms of Written of Prerequise Module of	coational ean describe istorical, ean describe istorical	ubject are f education structure of VET s and role f (vocation self-study ements:	as a profession ctures and for all and legal fractures and research as and research as in the VET (and pedagog), classroom so the certain all pedagog (classroom so the certain all pedagog).	on.  rms of the amework.  rch fields  ns of the system ical profesesions in	of educa (Vocationssionalisa)	tional sconal) Eduction	cience and v	in Germany	and con	as a sub-
5	Contents  Contents  Contents  Contents  Contents  Contents  Prorms of Learning  Participa  Formal:  Content:  Forms of Written of Prerequise  Module of Application	coational ean describe istorical, ean describe is iscipline of objectives, ramework contributor rocesses of teaching: units for stion requires assessment examination is it is is in the examination of the recommendation of the recommen	ubject are f education structure of VET s and role f (vocation self-study ements:	as a profession cures and for all and legal from the seas and research and science, and system as in the VET nall pedagog classroom seas and sexamination credit points on the following the same and sexamination credit points.	on.  rms of the amework.  rch fields  ms of the system gical profes  essions in  :	of educa (Vocationsionalisathe form	tional sconal) Eduction of exerce	cience and v	in Germany ocational ed	and con	as a sub-
5	Contents  Contents  Contents  Contents  Contents  Performs of Learning  Participa  Formal:  Content:  Forms of Written of Prerequise  Module of Application  Electrica	cational ean describe istorical, ean describe istorical, ean describe istorical, ean describe istorical, ean describe is iscipline or objectives, ramework contributor rocesses or teaching: units for stion requires assessment examination is it is is in the examination of the real language.	ubject are f education structure of VET s and role f (vocation self-study ements:	as a profession ctures and for all and legal fractures and research as and research as in the VET (and pedagog), classroom so the certain all pedagog (classroom so the certain all pedagog).	on.  rms of the amework.  rch fields  ms of the system gical profes  essions in  :	of educa (Vocationsionalisathe form	tional sconal) Eduction of exerce	cience and v	in Germany ocational ed	and con	as a sub-
5	Contents  Contents  Contents  Contents  Contents  Performs of Learning  Participa  Formal:  Content:  Forms of Written of Prerequise  Module of Application  Electrical combined	coational ean describe istorical, ean describe is iscipline or objectives, ramework contributor rocesses or teaching: units for stion requires assessment examination is it for the examination of the real language is tudies) (each of the real studies) (each of the real studies	ubject are f education structure of VET s and role f (vocation self-study ements:	as a profession cures and for all and legal from the legal from th	on.  rms of the amework.  rch fields  ms of the system ical profese essions in in ical profese essions ical profese essions in ical profese essions ical profese essions ical	of educa (Vocationsionalisathe form	tional sconal) Eduction of exerce	cience and v	in Germany ocational ed	and con	as a sub-
5	Contents  Contents  Contents  Cod  Cod  Forms of  Learning  Participa  Formal:  Content:  Forms of  Written of  Prerequise  Module of  Applicati  Electrica  combined  Important	cational ean describe istorical, ean describe is iscipline or objectives, ramework contributor recesses of teaching: units for storic in require examination is it is in require examination in of the reason of the recent is in the rec	ubject are f education structure of VET s and role f (vocation self-study ements:  - nt: on or oral of award of on pass module (in ing (part-(B.Eng.); grade for t	as a profession cures and for all and legal from the seas and research and science, and system as in the VET nally pedagog a classroom some examination credit points.	on.  rms of the amework.  rch fields  ns of the system ical profested profested profested studies)	of educa (Vocation ssionalisa the form rogramm (B.Eng.)	tional sconal) Eduction of exerces es)	cience and vucational T	ocational ed	and con	as a sub-
5	Contents Forms of Written of Prerequis Module of Applicati Electrica combined Importan Percentag	coational ean describe istorical, estandering objectives, ramework contributor rocesses of teaching: units for stion requires assessment examination of the relation of the relation of the graph of the	ubject are f education structure of VET s and role f (vocation self-study ements:	as a profession of crures and for all and legal from the ass and research of a science, and system as in the VET and pedagog and pedagog and pedagog are assument of the following time combines the final grade of credits of	on.  rms of the amework.  rch fields  ns of the system ical profested profested profested studies)	of educa (Vocation ssionalisa the form rogramm (B.Eng.)	tional sconal) Eduction of exerces es)	cience and vucational T	ocational ed	and con	as a sub-
j ,	Contents Forms of Written of Prerequise Module of Application Electricae combined Importan Percentag Module of Prof. Dr.	cational ean describe istorical, ean describe istorical, ean describe istorical, ean describe istorical, ean describe of the istorical each inguitation requires a samination of the reason of the grammation of the reason of the grammation of the grammatical end gramm	ubject are f education structure of VET s and role f (vocation self-study ements:	as a profession of crures and for all and legal from the ass and research of a science, and system as in the VET and pedagog and pedagog and pedagog are assument of the following time combines the final grade of credits of	on.  rms of the amework.  rch fields  ns of the system ical profested profested profested studies)	of educa (Vocation ssionalisa the form rogramm (B.Eng.)	tional sconal) Eduction of exerces es)	cience and vucational T	ocational ed	and con	as a sub-

Voc	ational Edi	acation II							BPD2	2
Iden num	tification ber:	Workload:	Credits:	Study	semeste	er:	Frequency offer	of the	Durati	ion:
4048		125 h	5	8th se	em.		Annual (Summer)		1 semester	
1	Course:		Planned group s	izes	Scope		Actual co		Self-stu	ıdy
	Lecture		60 students		2	SCH	0	h	62.5	h
	Tuition in	n seminars	30 students		0	SCH	0	h	0	h
	Exercise		20 students		1	SCH	8	h	38.5	h
		or seminar	15 students		1	SCH	16	h	38.3	h
		ed self-study	60 students		0	SCH	0	h	0	h
2		outcomes/comp								
3	rese des:  • recce emp  • are thece exe  • basse exe  Contents:  • Prir  • Res  • Cordes:	critically reflect carch on the bast derata in their confice teaching able to derive voretically sound able to describe ed on the frame implary way and acciples of acade earch objects, reflected on the deciples of acade earch objects, reflected on the state of acade earch objects.	ocational education manner, taking into the process of dev work curriculum of I transform it didac	knowled; ccific fiel bject-rela in issues of to accour reloping of an approtically.	ge. In the didanted didanted didanter proble at existing a teachin enticeshi	is contectics in the state of t	the context of to deal with a of scientifing scenario, ation, interp	over possible of VET resethem in a syce work, ret the learn	de research arch and systematica ning field	ally and
4		teaching: units for self-st	udy, classroom eve	ents in th	e form o	f exercis	ses and pract	icals		
5	Participat Formal: Content:	ion requiremen	ts:							
							· · · · · · · · · · · · · · · · · · ·		_	
6		assessment:	t							
	Term pap	er, course asses								
	Term par Prerequis	er, course asses	ssment d of credit points: s and course assess	sment						
7	Term pap Prerequis Module e Applicati	er, course assest ite for the award examination past on of the modul	d of credit points: s and course assess le (in the following	g study pi						
7	Term pap Prerequis Module e Applicati Electrical	er, course assestite for the award examination paston of the modulation.	d of credit points: s and course assess le (in the following part-time combined	g study pi			anical Engin	eering (part	-time	
7	Term pap Prerequis Module e Applicati Electrical combined Importan Percentag	per, course assessite for the awards amination passon of the module Engineering (plastudies) (B.Enge of the grade age based on the	d of credit points: s and course assess le (in the following part-time combined	study pr studies)	(B.Eng.)	); Mecha			-time	
6 7 8 9	Term pap Prerequis Module e Applicati Electrical combined Importan Percentag Module (	er, course assessite for the award examination passon of the modul Engineering (pl studies) (B.Ence of the grade age based on the	d of credit points: s and course assess le (in the following part-time combined g.); for the final grade: sum of credits of the	study pr studies)	(B.Eng.)	); Mecha			:-time	
7 8 9	Term pap Prerequis Module e Applicati Electrical combined Importan Percentag  Module C Prof. Dr.	per, course assessite for the awards amination passon of the module Engineering (plastudies) (B.Enge of the grade age based on the	d of credit points: s and course assess le (in the following part-time combined g.); for the final grade: sum of credits of the	study pr studies)	(B.Eng.)	); Mecha			-time	

CAD	)								CA	
	Identification Wornumber:		Credits:	Study	semeste	er:	Frequency of the offer		Duration:	
4008	CI.	125 h	5	2nd sem.		Annual (Summer)		1 semester		
1	Course:		Planned group size	zes	Scope		Actual co / classroo teaching		Self-stu	ıdy
	Lecture		60 students		2	SCH	0	h	62.5	h
	Tuition in	seminars	30 students		0	SCH	0	h	0	h
	Exercise		20 students		1	SCH	8	h	38.5	h
	Practical of	or seminar	15 students		1	SCH	16	h	0	h
	Supervise	d self-study	60 students		0	SCH	0	h	0	h
2	Learning	outcomes/comp	etences:		1		I			
	<ul><li>desc</li><li>crea</li><li>crea</li></ul>	te and manipula te 3D assemblie		of com	non 3D	CAD sy	stems.			
	Contents:  The students get to know and apply systems and working techniques of computer-aided construction.  CAD systems:  Definition and historical development, reasons for introduction and distribution, equipment technology, programmes for CAD, data exchange  CAD working techniques:  Input techniques, coordinate systems, operators and operands, construction methods for 2D geometry, 3D geometry models (corner, edge, surface, volume models), methods for structuring CAD data, variant construction through parameterisation, solid modelling through solid element synthesis, solid modelling through rotation and extrusion, levels of detail for 3D CAD models, application extensions  Practical on an integrated CAE system (Solid Edge, NX) with interface and data consideration for other CAE processes such as FEM, CAD/CAM, etc.									
4	Forms of Learning	_	ıdy, classroom evei	nts in the	e form o	f exercis	ses and pract	icals		
5	Participati Formal: Content:	ion requirement	S:							
6	Forms of	assessment:								
7	Combinat Prerequisi		of credit points:							
	Module ex	xamination pass	and course assessr							
8			e (in the following part-time combine							
9	Importance	ce of the grade f	or the final grade: um of credits of the				ling to RPO-	BA §32		
10	Module O	Officer:								
10		Ing. Herbert Fui	nke							
11	Other info									

	nosis and S	Support							DF	
Identi numb	ification er:	Workload:	Credits:	Study	semeste	er:	Frequency offer	of the	Duration:	
4045		125 h	5	7th se	m.		Annual (Winter)		1 semester	
1	Course:		Planned group siz	zes	Scope		Actual control / classroom teaching		Self-study	
	Lecture		60 students		2	SCH	0	h	62.5	h
ļ	Tuition in	seminars	30 students					h	0	h
	Exercise		20 students		1	SCH	8	h	38.5	h
		or seminar	15 students		1	SCH	16	h	0	h
	Supervise	d self-study	60 students		0	SCH	0	h	0	h
	<ul> <li>have a basic knowledge and understanding of the construct of diagnostic competence in the context of pedagogical action and can assess and/or deduce the significance of diagnostic competence, also taking into account empirical findings.</li> <li>know teaching features relevant to learning and can reflect on their significance against the background of their own learning biographical experiences. In this context, they reflect on and/or identify possible objects of exploration for teaching in the context of the orientation practical internship and develop a first basic understanding of research-based learning as a concept of higher education didactics.</li> <li>differentiate selected learning theories from each other and are additionally able to point out application references from the different theories in a well-founded way. In the process, they develop their own initial understanding of learning.</li> <li>are able to show the importance of competence orientation for the vocational education system and to assess its consequences, especially for the design of competence-oriented examinations.</li> <li>have a critical understanding of the aspects of individuality and heterogeneity in learning groups and, in this context, have basic knowledge of individual support for learners and their learning processes.</li> </ul>							ground ssible lop a lication own and to and, in		
_	Contents:  Basics of diagnostic competence of teachers in the context of pedagogical professionalisation, Research methodological principles of observation, observation and assessment tools, Observation and assessment errors, professional teaching perception, learning theories, Competence orientation, competence-oriented examinations, Individuality and heterogeneity in learning groups, individual support									
3	<ul> <li>Rese</li> <li>Obse</li> <li>Con</li> </ul>	earch methodolo ervation and ass apetence orienta	ogical principles of sessment errors, pro ation, competence-o	observa fessiona riented o	tion, obs il teachir examina	servation ng perce tions,	and assessi ption, learni	nent tools,		
3	<ul><li>Resc</li><li>Obso</li><li>Con</li><li>Indi</li></ul>	earch methodolo ervation and ass apetence orienta viduality and he teaching:	ogical principles of sessment errors, pro ation, competence-o	observa ofessional oriented of ning grou	tion, obs il teachin examina ups, indi	servation ng perce tions, vidual s	n and assessi ption, learni upport	ment tools, ng theories,		
	<ul><li>Resc</li><li>Obso</li><li>Con</li><li>Indi</li></ul>	earch methodolo ervation and ass apetence orienta viduality and he teaching:	ogical principles of sessment errors, pro ation, competence-o eterogeneity in learn	observa ofessional oriented of ning grou	tion, obs il teachin examina ups, indi	servation ng perce tions, vidual s	n and assessi ption, learni upport	ment tools, ng theories,		
4	<ul><li>Resc</li><li>Obso</li><li>Con</li><li>Indi</li></ul>	earch methodolo ervation and ass apetence orienta viduality and he teaching: units for self-stu	ogical principles of sessment errors, pro ation, competence-o eterogeneity in learn	observa ofessional oriented of ning grou	tion, obs il teachin examina ups, indi	servation ng perce tions, vidual s	n and assessi ption, learni upport	ment tools, ng theories,		
4	<ul> <li>Resc</li> <li>Obso</li> <li>Con</li> <li>Indi</li> </ul> Forms of Learning Participate	earch methodolo ervation and ass apetence orienta viduality and he teaching: units for self-stu	ogical principles of sessment errors, pro ation, competence-o eterogeneity in learn	observa ofessional oriented of ning grou	tion, obs il teachin examina ups, indi	servation ng perce tions, vidual s	n and assessi ption, learni upport	ment tools, ng theories,		
4	<ul> <li>Resc</li> <li>Obso</li> <li>Con</li> <li>Indi</li> </ul> Forms of Learning Participat Formal: Content:	earch methodolo ervation and ass apetence orienta viduality and he teaching: units for self-stu	ogical principles of sessment errors, pro ation, competence-o eterogeneity in learn	observa ofessional oriented of ning grou	tion, obs il teachin examina ups, indi	servation ng perce tions, vidual s	n and assessi ption, learni upport	ment tools, ng theories,		
4 5	<ul> <li>Resc</li> <li>Obso</li> <li>Con</li> <li>Indi</li> </ul> Forms of Learning Participat Formal: Content: Forms of	earch methodoloervation and assipetence orientaviduality and heterotechnical eaching: units for self-structure ion requirement  assessment:	ogical principles of sessment errors, pro ation, competence-o eterogeneity in learn	observa fessiona riented o ning grou	tion, obs il teachin examina ups, indi	servation ng perce tions, vidual s	n and assessi ption, learni upport	ment tools, ng theories,		
4 5	<ul> <li>Resc</li> <li>Obso</li> <li>Con</li> <li>Indi</li> </ul> Forms of Learning Participate Formal: Content: Forms of Written or Prerequisit	earch methodologervation and assumptence oriental viduality and hear teaching: units for self-structure ion requirement    -	ogical principles of sessment errors, pro ation, competence-oeterogeneity in learn addy, classroom ever	observa fessiona oriented on hing ground hts in the	tion, obs il teachin examina ups, indi	servation ng perce tions, vidual s	n and assessi ption, learni upport	ment tools, ng theories,		

	Electrical Engineering (part-time combined studies) (B.Eng.); Mechanical Engineering (part-time combined studies) (B.Eng.);
9	Importance of the grade for the final grade:
	Percentage based on the sum of credits of the graded modules according to RPO- BA §32
10	Module Officer:
	Prof. DrIng. Thorsten Jungmann
11	Other information:
	-

Produ	ection En	gineering I							FT1		
Identif numbe	fication er:	Workload:	Credits:	Study	semeste	er:	Frequency offer	of the	Durat	Duration:	
4020		125 h	5	5th se	sem.		Annual (Winter)		1 sem	1 semester	
1	Course:	<u>,                                      </u>	Planned group s	lanned group sizes Scope			Actual co		Self-study		
Ī	Lecture		60 students	60 students			0	h	62.5	h	
	Tuition in	n seminars	30 students			SCH	0	h	0	h	
	Exercise		20 students		1	SCH	8	h	38.5	h	
	Practical	or seminar	15 students		1	SCH	16	h	0	h	
	Superviso	ed self-study	60 students		0	SCH	0	h	0	h	
3	Learning outcomes/competences:  After successful attendance of the course, the students are able to  • compare the basics of industrial manufacturing of workpieces  • differentiate the main groups of manufacturing processes  • the important manufacturing processes of the main groups forming, shaping, cutting, implement joining and coating  • evaluate the effect of the manufacturing parameters of these selected manufacturing processes on quality and costs  • evaluate the application of these procedures  • carry out simple calculations for the most important manufacturing processes										
4		teaching:	udy, classroom eve	ante in th	a form o	favorois	eac and proof	icals			
_				ziits III tN	e ioriii o.	i exercis	ses and pract	icais			
5	Participal Formal:	tion requirement	is:								
-	Content:	-									
6		assessment:									
	1 011113 01	abbobbiliont.									

7	Prerequisite for the award of credit points:
	Module examination pass and course assessment
8	Application of the module (in the following study programmes)
	Mechanical Engineering (part-time combined studies) (B.Eng.);
9	Importance of the grade for the final grade:
	Percentage based on the sum of credits of the graded modules according to RPO- BA §32
10	Module Officer:
	Prof. DrIng. Magnus Horstmann
11	Other information:
	-

Prod	uction Eng	gineering II							FT2		
Ident numb	ification	Workload:	Credits:	Study	y semeste	er:	Frequency offer	of the	Durat	ion:	
4024	er.	125 h	5	6th se	em.		Annual (Summer)		1 semester		
1	Course:		Planned group si	zes	Scope		Actual c time / cla teaching	assroom	Self-study		
	Lecture		60 students	<u> </u>			h	62.5	h		
	Tuition in	seminars	30 students		0	SCH	0	h	0	h	
	Exercise		20 students		2	SCH	16	h	46.5	h	
	Practical	or seminar	15 students		0	SCH	0	h	0	h	
	_	Supervised self-study 60 students				SCH	0	h	0	h	
	Learning outcomes/competences:  After successfully completing this module, students will be able to  differentiate in detail the applications of important industrial manufacturing processes for the production of metalworking workpieces  evaluate typical machines and tools for the selected manufacturing processes  evaluate the effect of manufacturing parameters on quality and costs, plan suitable processes from them  carry out calculation methods for the most important manufacturing processes  be able to assess the essential tasks in planning and controlling production										
	technolog addressed tools are p productiv In additio in a produ  1. Machir - Overvie 2. Advanc - Calculat 3. Special - Calculat 4. Produc - Work pr	y and machining. To understand presented. The rity and flexibiling, students are truction planning. The tools for many was a structure - lead Forming Maion methods - rition planning are paration - Processing Maion methods - rition planning are paration - Processing Maion methods - rition planning are paration - Processing Maion methods - rition planning are paration - Processing Maion methods - rition planning are paration - Processing Maion methods - rition planning are paration - Processing Maion methods - rition planning are paration - Processing Maion methods - rition planning are paration - Processing Maion methods - rition planning are paration - Processing Maion methods - rition planning are paration - Processing Maion methods - rition planning are paration - Processing Maion methods - rition planning are paration - Processing Maion methods - rition planning are paration - Processing Maion methods - rition planning are paration - Processing Maion methods - rition planning are paration - Processing Maion methods - rition planning are paration - Processing Maion methods - rition planning are paration - Processing Maion methods - rition planning are paration - Processing Maion methods - rition planning are paration - Processing Maion methods - rition method	ufacturing Requirements anufacturing Proces nachine/plant techn ining processes nachine/plant techn	rocesses e equipir automa xamples dge for sesses ology ology	. Current ment use tion is ex (flexible solving the	trends i d, machi kplained e produce ne divers	n research a ine types and in relation t tion cells, m se planning t	nd develop d applicatio o the requin achining co asks in prod	ment will on areas of rements fo entres, etc duction, ea	be machine or .).	
4	Forms of	-	ıdy, classroom sess	sions in	the form	of exerc	rises				
5		ion requirement	-		101111	or exerc					
	Content:	-									
6	Forms of	assessment:									
	Written ex	xamination or o	ral examination								
7	Prerequisi	ite for the award	d of credit points:								
		xamination pass									
8	Application	on of the modul	e (in the following	study pi	rogramm	es)					

	Mechanical Engineering (part-time combined studies) (B.Eng.);
9	Importance of the grade for the final grade:
	Percentage based on the sum of credits of the graded modules according to RPO- BA §32
10	Module Officer:
	Prof. DrIng. Magnus Horstmann
11	Other information:
	-

Plast	ics Produc	tion Process							FVK	
Identi numb	fication er:	Workload:	Credits:	Study	semeste	er:	Frequency offer	of the	Durati	on:
4032	<b>.</b>	125 h	5	8th se	em.		Annual (Summer)		1 semester	
1	Course:		Planned group s	izes	Scope	:	Actual co		Self-stu	dy
	Lecture		60 students		2	SCH	0	h	62.5	h
	Tuition in	seminars	30 students		0	SCH	0	h	0	h
	Exercise		20 students		1	SCH	8	h	38.5	h
		or seminar	15 students		1	SCH	16	h	0	h
	Supervise	ed self-study	60 students		0	SCH	0	h	0	h
3	Supervised self-study 60 students 0 SCH 0 h 0 h  Learning outcomes/competences: Students:  • are able to assess the essential processes of plastics processing in a practice-orientated manner and to use them in an application-orientated manner.  • know the essential design criteria for tools used in plastics processing, especially for injection moulds.									
4	Forms of Learning		udy, classroom eve	ents in th	e form o	f exercis	es and pract	icals		
5	-	ion requiremen	ts:							
	Formal: Content:									
		assessment:								
6	Forms of	assessificit.								
6	Written ex	xamination or c		Written examination or oral examination  Prerequisite for the award of credit points:						
6 7	Written ex Prerequisi	xamination or o		ment						
	Written ex Prerequisi Module ex Application	xamination or content of the award the samination passon of the module.	d of credit points:	study pr	-					

10	Module Officer:
	Prof. DrIng. Bruno Hüsgen
11	Other information:
	-

Fund	damentals	of Electrical E	ngineering						GLE'	Γ
Ident numl	ification per:	Workload:	Credits:	Study	y semeste	er:	Frequency offer	of the	Durat	ion:
4012		125 h	5	3rd s	em.		Annual (Winter)		1 sem	ester
1	Course:		Planned group si	izes	Scope		Actual contact time / classroom teaching		Self-study	
	Lecture		60 students		2	SCH	0 h		62.5 h	
	Tuition in	n seminars	30 students		0	SCH	0	h	0	h
	Exercise		20 students		1	SCH	8	h	38.5	h
		or seminar	15 students		1	SCH	16	h	0	h
2		ed self-study	60 students		0	SCH	0	h	0	h
	Learning outcomes/competences:  Students understand the basic physical principles of electrical machines and drives and can evaluate, select and apply the different types of machines in an industrial environment. The analysis of equivalent circuit diagrams and operating characteristics is also taught.  The students can create simple linear circuits with the help of the complex  Analyse and calculate alternating current calculation. The different types of power (active, reactive and apparent power) can be adequately illustrated.									
3	Contents:									
	Electrical engineering basics: Power, work, efficiency in mechanics and electrical engineering. Linear inputs R, L and C. Characteristics of periodic stresses. Complex alternating current calculation.									
	Active, reactive and apparent power.  Moment formation in electrical machines.  Three-phase alternating current.  Special electrical machines: Direct current machine, three-phase asynchronous machine, synchronous machine Introduction to modern drive technology and current straightening technology  Integrated practical experiment: Operating behaviour, characteristic curve recording									
4	Forms of	teaching:	idy, classroom eve							
5	Formal:	tion requirement	s:							
	Content:	-					_			
6		assessment: examination or o	ral examination							
7			of credit points:							
_	Module e	examination pass	and course assess							
8			e (in the following (part-time combine					_		
9			or the final grade:	a studie	o) (D.Ell	5.),				
,	_	_	sum of credits of the	e gradeo	d module	s accord	ling to RPO-	BA §32		
10	Module (									
		Ing. Sebastian I	Hoffmann							
11	Other inf	ormation:								
	-									

Func	lamentals (	of Industrial C	omputer Science						GIN	
Ident numb	ification per:	Workload:	Credits:	Study	semeste	er:	Frequency offer	of the	Durati	ion:
4005		125 h	5	1st se	m.		Annual (Winter)		1 sem	ester
1	Course:		Planned group si	zes	Scope	:	Actual contact time / classroom teaching		Self-stu	ıdy
	Lecture		60 students		2	SCH	0 h		62.5	h
	Tuition in	seminars	30 students		0	SCH	0	h	0	h
	Exercise		20 students		1	SCH	8	h	38.5	h
	Practical	or seminar	15 students		1	SCH	16	h	0	h
	Supervise	ed self-study	60 students	60 students 0 SCH 0 h						h
3	After completion of the module, students:  • master the terminology of computer science and are able to understand the logic of programming as well as object orientation.  • have basic knowledge of the functioning of computer systems and can present these.  • are able to structure simple information technology problems and transfer them into solution modules.  • have the ability to solve simple problems independently in the programming language C++/C#.  • have basic knowledge of the application and implementation of simple algorithms and can apply this knowledge in practice.  • have basic competences for the analysis of problems and the structured transformation into simple procedural and modularised system solutions.  Contents:  Basic concepts  Basic representation of data in computer systems, Boolean algebra, basic programming using editor, compiler, linker and integrated development environments.  Introduction to object-oriented programming  Introduction to the programming language C++/ C#: General structure of a C++ programme  Variable types, structures  Functions for input and output  Control structures									
	Vectors a Recursion	elements of obje nd pointers n / Iteration, Mo Igorithms etc.	dular Programming	g. Algori	thms and	d data st	ructures			
4	Forms of	-								
	Learning	units for self-st	udy, classroom eve	nts in the	e form o	f exercis	ses and pract	icals		
4 5	Learning Participat	-		nts in the	e form o	f exercis	ses and pract	icals		
	Learning Participat Formal:	units for self-str		nts in the	e form o	f exercis	ses and pract	icals		
5	Learning Participat Formal: Content:	units for self-strion requirement		nts in the	e form o	f exercis	ses and pract	icals		
	Participat Formal: Content: Forms of	units for self-strion requirement  assessment:	is:		e form o	f exercis	ses and pract	icals		
5	Participat Formal: Content: Forms of Written o	units for self-strion requirement  assessment: r oral examinati			e form o	f exercis	ses and pract	icals		

8	Application of the module (in the following study programmes)
	Mechanical Engineering (part-time combined studies) (B.Eng.);
9	Importance of the grade for the final grade:
	Percentage based on the sum of credits of the graded modules according to RPO- BA §32
10	Module Officer:
	Prof. DrIng. Jürgen Sauser
11	Other information:
	-

Func	lamentals	of Mechanical	Process Enginee	ering					GMV	TT
Ident numb	ification per:	Workload:	Credits:	Study	semeste	er:	Frequency offer	of the	Durat	ion:
4077		125 h	5	7th se	em.		Annual (Winter)		1 sem	ester
1	Course:	,	Planned group s	sizes	Scope		Actual control / classroot teaching		Self-stu	ıdy
	Lecture		60 students		2	SCH	0	h	62.5	h
	Tuition in	n seminars	30 students		0	SCH	0	h	0	h
	Exercise		20 students		2	SCH	16	h	46.5	h
	Practical	or seminar	15 students		0	SCH	0	h	0	h
	Supervised self-study		60 students		0	SCH	0	h	0	h
3	Learning outcomes/competences:  The students are able to reproduce the essence of process engineering and to classify and explain the most important basic operations of process engineering and especially of mechanical process engineering in the overal context.  The students know the basic sequence of a process as a result of acting force fields, energy and mass flows and can characterise it. Furthermore, they can map processes for mixing, separating and agglomerating and comminuting substances/substance mixtures. The students can explain the different apparatus and machines for separating mixtures of substances (cyclone, filter, centrifuges). The students are able to dimension a centrifuge for a specific application and optimise the process parameters of a centrifuge in different applications. The students can describe the design and function of disc separators and decanters.									
	Contents: Introduction to process engineering: Classification of mechanical process engineering in general process engineering Distinction from chemical and thermal process engineering Fluid mechanics and thermodynamics and fundamentals of mixtures Fluid mechanics fundamentals Particle description/ distribution Properties of mixtures Stokes' sink rate, sedimentation, emulsion Processes of mechanical process engineering Separation/mixing (air classifiers, sieves, filters, flocculants, homogenisers, membrane filtration, stirrers) Size reduction/agglomeration (mill, homogenisers, mazarator) Conveying/storage (pumps, vibrating screens,) Mechanical process engineering /separation technology: Processes (filter, cyclone, centrifuge), basics of filtration, press filtration, membrane filtration, differences between the processes clarification, separation, dewatering; Filter cake Centrifugal separation technology Design and function of centrifuges (disc separator and decanter); 2-phase and 3-phase application, process integration, flocculants, material flow balances, heap dewatering									
4		teaching:								
		Learning units for self-study, classroom sessions in the form of exercises								
	Participation requirements:									
5	Formal:		CS:							
5		tion requirement	S:							
5	Formal: Content:	tion requirement	s:							
	Formal: Content: Forms of	tion requirement assessment:	ral examination							

	Module examination pass
8	Application of the module (in the following study programmes)
	Mechanical Engineering (part-time combined studies) (B.Eng.);
9	Importance of the grade for the final grade:
	Percentage based on the sum of credits of the graded modules according to RPO- BA §32
10	Module Officer:
	Prof. DrIng. Jürgen Hermeler
11	Other information:
	-

Indu	ıstrial Man	agement							IBL	
Iden	tification ber:	Workload:	Credits:	Study	y semeste	er:	Frequency offer	of the	Duration:	
4018		125 h	5	4th s	em.		Annual (Summer)		1 sem	ester
1	Course:		Planned group s	izes	Scope		Actual contact time / classroom teaching		Self-study	
	Lecture		60 students		2	SCH	0	h	62.5 h	
	Tuition ir	n seminars	30 students			SCH	0	h	0	h
	Exercise		20 students	20 students		SCH	16	h	46.5	h
	Practical	or seminar	15 students		0	SCH	0	h	0	h
	Supervised self-s		60 students		0	SCH	0	h	0	h
2	Learning outcomes/competences:  Students are able to  understand the business management interrelationships in industrial companies.  carry out investment calculations, both with simple static, as well as with dynamic methods.  assess the relevance of key performance indicator systems for evaluating different areas of the company.  make rational decisions to solve problems according to operational goals.  In the areas of materials management, production, sales and finance, the aim of the project is to address essential functions and solve problems.									
3	Contents: Students are taught the business management way of thinking and basic knowledge from the sub-areas of industrial management. Objective of the industrial operation Operational organisation: Process and organisational structure, project management Materials management: Materials, purchasing, materials planning/quantity planning, warehouse management Production management: Production planning and strategy, production programme planning, sales-market orientation of the company								gement	
	Cost type Financing Key figur	g and investment res of controlling	counting, cost unit	t account	ting					
4		units for self-stu	ıdy, classroom ses	sions in	the form	of exerc	cises			
5	Participat Formal: Content:	tion requirement - -	S:							
6	Forms of	assessment: xamination or o	ral examination							
7	Prerequis		l of credit points:							
8	Applicati Electrical	on of the module	e (in the following art-time combined		_		nnical Engin	eering (part	-time	
9	Importan	ce of the grade f	or the final grade: sum of credits of the	ne gradeo	d module	s accord	ling to RPO-	BA §32		
10	Module (		hrig							
		Prof. DrIng. Michael Fahrig Other information:								

mal	ıstrial Con	trol Technolog	у						IST	
Iden num	tification ber:	Workload:	Credits:	Study	semeste	er:	Frequency offer	of the	Durati	ion:
4076	5	125 h	5	6th se	em.		Annual (Summer)		1 sem	ester
1	Course:	1	Planned group	sizes	Scope	l	Actual contact time / classroom		Self-study	
	Lecture		60 students		2	SCH	teaching 0 h		62.5	h
		n seminars	30 students			SCH	0	h	0	h
	Exercise		20 students		1	SCH	8	h	38.5	h
		or seminar	15 students		1	SCH	16	h	0	h
	Supervise	ed self-study	60 students		0	SCH	0	h	0	h
2	The stude application application They will suitable so Students programme based contacts.	on in technical s I learn how to co sensors and actu- are able to analy ming languages ntrol technology	wledge of the fun- ystem solutions ar onfigure PLCs wit ators and how to r yse and specify sir of the PLC world. and select and im the functioning of	nd can rep th the app relate thes mple auto They can aplement	oroduce a ropriate i e areas to mation p n assess t suitable s	nd expland and each of cach of	ain them.  d output mo ther.  and implen bilities and	dules as we	ell as the sons with di	election of fferent l and PC-
		s	ustrial control tech	nnology						
	Profibus, Distribut Decentra PLC tech Structure Operatin PLC prog Introduct Programs Function	application, type EtherCAT) ed control techn lised control techn nology and function of g systems and of gramming basics tion to programming of automatal al safety in cont- ment of safety-re-	programmable lo perating behavious is IEC61131 archit ning according to ion applications	gic contro gic contro r of PLCs ecture IEC6113	ollers 1-3		bus systems	s (CAN,		
4	Profibus, Distribut Decentra PLC tech Structure Operatin PLC prog Introduct Programs Function Requiren level Safety co	application, type EtherCAT) ed control techn lised control techn lised control techn mology and function of g systems and of gramming basics ion to programming of automatal al safety in continent of safety-re- entrols	ology hnology  programmable lo perating behavious s IEC61131 archit ning according to ion applications rol systems	gic control of PLCs ecture IEC6113	ollers 1-3 nd perfor	mance				
	Profibus, Distribut Decentra PLC tech Structure Operatin PLC prog Introduct Programs Function Requiren level Safety co	application, type EtherCAT) ed control techn lised control techn gramming basics ion to programm ming of automat al safety in control ment of safety-re ontrols  Teaching: units for self-st	ology hnology  programmable loperating behavious IEC61131 archit ning according to ion applications rol systems lated controls IEC	gic control of PLCs ecture IEC6113	ollers 1-3 nd perfor	mance				
4 5	Profibus, Distribut Decentra PLC tech Structure Operatin, PLC prog Introduct Programs Function Requiren level Safety co	application, type EtherCAT) ed control techn lised control techn lised control techn mology and function of g systems and of gramming basics ion to programming of automatal al safety in continent of safety-re- entrols	ology hnology  programmable loperating behavious IEC61131 archit ning according to ion applications rol systems lated controls IEC	gic control of PLCs ecture IEC6113	ollers 1-3 nd perfor	mance				
	Profibus, Distribut Decentra PLC tech Structure Operatin, PLC prog Introduct Programs Function Requiren level Safety co Forms of Learning  Participa Formal:	application, type EtherCAT) ed control techn lised control techn gramming basics ion to programm ming of automat al safety in control ment of safety-re ontrols  Teaching: units for self-st	ology hnology  programmable loperating behavious IEC61131 archit ning according to ion applications rol systems lated controls IEC	gic control of PLCs ecture IEC6113	ollers 1-3 nd perfor	mance				
	Profibus, Distribut Decentra PLC tech Structure Operating PLC prog Introduct Programs Function Requiren level Safety co Forms of Learning Participa Formal: Content:	application, type EtherCAT) ed control techn lised control techn gramming basics ion to programming of automata la safety in controls feaching: units for self-st tion requiremen	ology hnology  programmable lo perating behavious s IEC61131 archit ning according to ion applications rol systems lated controls IEC  udy, classroom ev ts:	gic control of PLCs ecture IEC6113	ollers 1-3 nd perfor	mance				
6	Profibus, Distribut Decentra PLC tech Structure Operating PLC prog Introduct Programs Function Requiren level Safety co Forms of Learning Participa Formal: Content: Forms of Written of	application, type EtherCAT) ed control techn lised control techn gramming basics ion to programming of automat al safety in controls feaching: units for self-st tion requiremen	ology hnology  programmable lo perating behavious s IEC61131 archit ning according to ion applications rol systems lated controls IEC  udy, classroom ev ts:	gic control of PLCs ecture IEC6113	ollers 1-3 nd perfor	mance				
5	Profibus, Distribut Decentra PLC tech Structure Operating PLC prog Introduct Programs Function Requiren level Safety co Forms of Learning Participa Formal: Content: Forms of Written e	application, type EtherCAT) ed control techn lised control techn and function of g systems and o gramming basics ion to programming of automat al safety in continent of safety-re ontrols  Teaching: units for self-st tion requiremen	ology hnology  programmable lo perating behavious s IEC61131 archit ning according to ion applications rol systems lated controls IEC  udy, classroom ev ts:	gic control of PLCs ecture IEC6113	ollers 1-3 nd perfor	mance				

	Mechanical Engineering (part-time combined studies) (B.Eng.);
9	Importance of the grade for the final grade:
	Percentage based on the sum of credits of the graded modules according to RPO- BA §32
10	Module Officer:
	Prof. DrIng. Sebastian Hoffmann
11	Other information:
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L T E Pr Sr 2 L Sr id	Exercise Practical or sen Exercise Practical or sen Exercise Cupervised self Learning outco Students unders deas and new s	nars  -study  mes/compe stand how to solutions by basic skills the basics of	o apply innovatio	7th sessizes	Scope  2 0 1 1 0 ques and	SCH SCH SCH SCH SCH SCH	/ classror teaching  0  0  8  16	h h h h	1 seme Self-stu  62.5 0 38.5 0 vhen dev	h h h h
1 C L T E Pr Sri	Course:  Lecture  Fuition in semi  Exercise  Practical or sen  Supervised self  Learning outco  Students unders deas and new s  learning b  learning t	nars  -study  mes/compe stand how to solutions by basic skills the basics of	Planned group s  60 students 30 students 15 students 60 students tences: o apply innovation	on technic	Scope  2 0 1 1 0 ques and	SCH SCH SCH SCH SCH	(Winter)  Actual co / classroot teaching  0  0  8  16	h h h h	Self-stu  62.5  0  38.5  0	h h h h
L T E Pr Si	Exercise Practical or sen Supervised self Learning outco Students unders deas and new s  learning t	ninar -study mes/compe stand how to solutions by basic skills to	60 students 30 students 20 students 15 students 60 students tences: o apply innovation	on technic	2 0 1 1 1 0 ques and	SCH SCH SCH SCH SCH	/ classror teaching  0  0  8  16	h h h h	62.5 0 38.5 0	h h h h
T E Pri Sti di	Exercise Practical or sens Supervised self Learning outco Students unders deas and new s  learning t	ninar -study mes/compe stand how to solutions by basic skills to	30 students 20 students 15 students 60 students tences: o apply innovation	cilitate w	0 1 1 0 ques and	SCH SCH SCH SCH sch sch	0 8 16 0	h h h	0 38.5 0	h h h
T E Pri Sti di	Exercise Practical or sens Supervised self Learning outco Students unders deas and new s  learning t	ninar -study mes/compe stand how to solutions by basic skills to	30 students 20 students 15 students 60 students tences: o apply innovation	cilitate w	0 1 1 0 ques and	SCH SCH SCH SCH sch sch	0 8 16 0	h h h	0 38.5 0	h h h
Property of the state of the st	Practical or sen Supervised self Learning outco Students unders deas and new s  learning b	mes/compe stand how to solutions by pasic skills the basics of	15 students 60 students tences: o apply innovation to prepare and face	cilitate w	1 0 ques and	SCH SCH use then	0	h h	0	h h
Si L Si id	Eupervised self  Learning outco  Students unders deas and new s  learning b	mes/compe stand how to solutions by pasic skills the basics of	60 students tences: o apply innovation to prepare and fac	cilitate w	0 ques and	SCH use then	0	h	0	h
2 L Si	Learning outco Students unders deas and new s  learning b	mes/compe stand how to solutions by pasic skills the basics of	tences: o apply innovatio	cilitate w	ques and	use then				
Sid	Students underside deas and new s  learning b	stand how to solutions by pasic skills the basics of	o apply innovation  to prepare and fac	cilitate w	orkshops	S.	n in a target	ed manner v	vhen dev	eloping nev
2 0	<ul> <li>understan this know</li> </ul>	ding and ev	valuating the poss	sibilities a	and limit	s of appl				
In In B	Basics for setting Selection and c	niques in p ng up a crea ombination	oroduct developm nativity workshop of different crea development of no	tivity tec	hniques	anageme	ent			
4 Fe	Forms of teachi	ing:	dy, classroom eve			f exercise	es and pract	icals		
Fe	Participation re Formal: Content:	quirements - -	:							
~	Forms of assess Oral examination		paper or project w	vork						
			of credit points: and course assess	sment						
			(in the following part-time combine		-					
9 In	mportance of t	he grade fo	or the final grade: nm of credits of the				ing to RPO-	BA §32		
	Module Officer Prof. DrIng. T		rdisch							
	Other informati									

COH	oquium								KOL	
Identi	ification per:	Workload:	Credits:	Study	semeste	er:	Frequency offer	of the	Durati	on:
1290		75 h	3	9th se	em.		each seme	ster	1 sem	ester
1	Course:		Planned group sizes		Scope	;	Actual contact time / classroom teaching		Self-study	
	Lecture		60 students		0	SCH	0 h		75	h
	Tuition in	seminars	30 students		0	SCH	0	h	0	h
	Exercise		20 students		0	SCH	0	h	0	h
	Practical	or seminar	15 students		0	SCH	0	h	0	h
	Supervise	ed self-study	60 students		0	SCH	0	h	0	h
	related fo justify the significan	undations, its in em themselves. ace for practice.	dents show that th terdisciplinary cor Students can critica	nnections	and its	extra-sub	ject-related	references	orally and	l to
3	Contents:  The colloquium complements the master thesis and is to be assessed independently. Content of the thesis according to the topic  Defence of the procedure used in writing the thesis and questions that arose in the context of the work.									
			pic							
4		of the procedure	pic							
4	Forms of Oral exam	of the procedure teaching:	pic used in writing th							
4 5	Forms of Oral exan Participat	of the procedure teaching:	pic used in writing th							
	Forms of Oral exam Participat Formal:	teaching: nination ion requirement All m must	pic used in writing the ts: odules of the study be successfully con	e thesis a	and ques	tions tha	t arose in th	e context of	the work	
5	Forms of Oral exam Participat Formal:	teaching: nination ion requirement All m must Treati	pic used in writing the state of the study	e thesis a	and ques	tions tha	t arose in th	e context of	the work	
	Forms of Oral exam Participat Formal:  Content: Forms of	teaching: nination ion requirement All m must Treats	pic used in writing the ts: odules of the study be successfully con	y programmpleted.	nme mus	tions tha	t arose in th	e context of	the work	
5	Forms of Oral exam Participat Formal:  Content: Forms of Oral exam Prerequis	teaching: nination ion requirement All m must Treats assessment: nination for a m	e used in writing the used in writing the used in writing the second control of the study be successfully coment of the bachele	y programmpleted.	nme mus	tions tha	t arose in th	e context of	the work	
5 6 7	Forms of Oral exam Participat Formal:  Content: Forms of Oral exam Prerequise Passed contents	teaching: nination ion requirement All m must Treats assessment: nination for a m ite for the award	pic sused in writing the sused in writing the sis: odules of the study be successfully coment of the bachelo aximum duration of the suse o	y programmeleted. or thesis	nme mus	st be succ	t arose in th	e context of	the work	
5	Forms of Oral exam Participat Formal: Content: Forms of Oral exam Prerequis Passed co Application Electrical	teaching: mination ion requirement All m must Treat: assessment: mination for a m ite for the award olloquium on of the modul Engineering (p	e used in writing the sused in writing the state.  Second of the study be successfully comment of the bachelo aximum duration of the suse of the suse of the successfully comment of the bachelo aximum duration of the successfully comment of the bachelo aximum duration of the successful points:  The sused in writing the sused in writing the sused in the successful points.	y programmeleted. or thesis	nme mus	est be successes)	cessfully co	mpleted. Th	the work	
5 6 7 8	Forms of Oral exam Participat Formal: Content: Forms of Oral exam Prerequis Passed co Application Electrical combined	teaching: mination ion requirement All m must Treats assessment: mination for a m ite for the award alloquium on of the modul Engineering (p I studies) (B.Engi	e used in writing the sused in writing the sused in writing the state of the study be successfully coment of the bachelo aximum duration of d of credit points:  The companion of the following art-time combined (g.);	y programmeleted. or thesis of 75 min	nme mus	est be successes)	cessfully co	mpleted. Th	the work	
5 6 7	Forms of Oral exam Participat Formal:  Content: Forms of Oral exam Prerequis Passed co Application Electrical combined Importance	teaching: nination ion requirement All m must Treats assessment: nination for a m ite for the award olloquium on of the modul Engineering (p I studies) (B.Engee of the grade f	e used in writing the sused in writing the state.  Second of the study be successfully comment of the bachelo aximum duration of the suse of the suse of the successfully comment of the bachelo aximum duration of the successfully comment of the bachelo aximum duration of the successful points:  The sused in writing the sused in writing the sused in the successful points.	y programmpleted. or thesis of 75 min	nme mus	st be success); Mecha	cessfully co	mpleted. The	the work	
5 6 7 8	Forms of Oral exam Participat Formal:  Content: Forms of Oral exam Participat Formal:  Content: Forms of Oral exam Prerequis Passed co Application Electrical combined Important Percentage Module O	teaching:  mination ion requirement  All m must  Treat: assessment: mination for a m  ite for the award folloquium on of the modul Engineering (p I studies) (B.Engue of the grade for t	sis:  odules of the study be successfully comment of the bachelo aximum duration of d of credit points: e (in the following art-time combined g.); or the final grade: sum of credits of the	y programmpleted. or thesis of 75 min	nme mus	st be success); Mecha	cessfully co	mpleted. The	the work	
5 6 7 8 9	Forms of Oral exam Participat Formal:  Content: Forms of Oral exam Participat Formal:  Content: Forms of Oral exam Prerequis Passed co Application Electrical combined Important Percentage Module O	teaching: mination ion requirement All m must Treats assessment: mination for a m ite for the award olloquium on of the modul Engineering (pl studies) (B.Enge of the grade for the grade for the second the seco	sis:  odules of the study be successfully comment of the bachelo aximum duration of d of credit points: e (in the following art-time combined g.); or the final grade: sum of credits of the	y programmpleted. or thesis of 75 min	nme mus	st be success); Mecha	cessfully co	mpleted. The	the work	

Desi	gning with	Plastics							KMK	(S
	ification	Workload:	Credits:	Study	semeste	er:	Frequency	of the	Durati	ion:
numb 4080		125 h	5	8th se	em.		offer Annual (St	ummer)	1 sem	ester
1	Course:		Planned group six	zes	Scope		Actual contact time / classroom teaching 0 h		Self-study  62.5 h	
	Lecture		60 students		2	SCH				
	Tuition in	seminars	30 students			SCH	0	h	0	h
	Exercise		20 students	20 students		SCH	8	h	38.5	h
	-	or seminar	15 students			SCH	16	h	0	h
	Supervise	d self-study	60 students		0	SCH	0	h	0	h
3	Students are able to reproduce the design and construction guidelines of injection moulded parts and extrusion profiles and apply them to designs. They are able to design and create plastic components suitable for production. During the practical, the students deepen their theoretical knowledge.									
	Contents:  Students are taught the design and construction guidelines of injection moulded parts as well as extrusion profiles.  Introduction and definitions  Moulded part development, process selection, material selection  Strength calculation and dimensioning, characteristic value and characteristic function, mechanical behaviour of plastics, molecular orientations, failure case, uniaxial and multiaxial stress states, calculation of mechanical stresses  Designing injection moulded parts from thermoplastics and thermosets  Designing extrusion profiles  Design of welded and bonded joints									
4	Forms of Learning	teaching:	ıdy, classroom ever	nts in the	e form o	f exercis	ses and pract	icals		
5	Participat Formal: Content:	ion requirement	S:							
6		assessment: r oral examinati	on (also possible in	partial	perform	ances)				
7	Prerequisi Module e	ite for the award xamination pass	d of credit points: s and course assessi	ment						
8	Mechanic	al Engineering	e (in the following (part-time combine							
9	_	_	or the final grade: sum of credits of the	e graded	module	s accord	ling to RPO-	BA §32		
10	Module C	Officer: Ing. Bruno Hüs	gen							
11	Other info		D							

Cons	truction E	lements	I							KE1	
Identi numb	fication er:	Workl	oad:	Credits:	Study	semeste	er:	Frequency offer	of the	Duration:	
4011	<b>C1.</b>	125 h		5	3rd se	em.		Annual (Winter)		1 sem	ester
1	Course:			Planned group si	izes	Scope	:	Actual contact time / classroom teaching		Self-stu	ıdy
	Lecture			60 students		2	SCH	0	h	62.5	h
	Tuition in	semina		30 students		0	SCH	0	h	0	h
	Exercise			20 students		1	SCH	8	h	38.5	h
	Practical of	or semin	ar	15 students		1	SCH	16	h	0	h
	Supervise	d self-st	udy	60 students		0	SCH	0	h	0	h
3	designate of the second s	gn the ball their kaimple cosical, maument the ordance where taught construction of the dato production systems and exacts a land exacts and production of the dato production systems.	asic feature construction aterial, teceir own construction at about the state of the construction at about the construction at about the construction, state of the construction at a constructi	and disadvantage res of the machine from previous bonal problems and chnological and econstructive properandards.  The function and secons of the function a	ne element obtained by the conomic obtained by the con	nts prese jects in o se them aspects solution of machining with ements, to substance in bearing	ented.  order to taking i  as as far  ine elem design tolerance e conne gs	find solution nto account as possible in the second	as their calcesign accord	ing to force	rce, design e-fit c
4	Forms of	_									
	Learning	units for	self-stud	y, classroom eve	nts in the	e form o	f exercis	ses and pract	icals		
5	Participati	ion requ	irements:								
	Formal:		-								
	Content:		-								
6	Forms of	assessm	ent:								
	Written ex	xaminati	on or ora	l examination							
7	Prerequisi	ite for th	e award o	of credit points:							
	Module ex	<u>xami</u> nati	ion pass a	and course assess	ment						
8	Application	on of the	module	(in the following	study pr	ogramm	es)				

	Mechanical Engineering (part-time combined studies) (B.Eng.);						
9	Importance of the grade for the final grade:						
	Percentage based on the sum of credits of the graded modules according to RPO- BA §32						
10	Module Officer:						
	Prof. DrIng. Michael Fahrig						
11	Other information:						
	-						

Cons	struction E	llements II							KE2		
Identification Workloa		Workload:	Credits:	Study	Study semester:		Frequency of the offer		Durat	Duration:	
4013		125 h	5		4th sem.		Annual (Summer)		1 semester		
1	Course:		Planned group sizes		Scope		Actual contact time / classroom teaching		Self-study		
	Lecture		60 students		2	SCH	0	h	62.5	h	
	Tuition in seminars		30 students		0	SCH	0	h	0	h	
	Exercise		20 students		2	SCH	16	h	46.5	h	
	Practical or seminar		15 students		0	SCH	0	h	0	h	
	Supervised self-study		60 students		0	SCH	0	h	0	h	
3	Learning outcomes/competences:  Students are able to  explain the function of the machine elements presented.  hame the advantages and disadvantages of technical alternatives.  design the basic features of the machine elements presented.recall their knowledge from previous basic subjects in order to find solutions for simple constructional problems and to realise them taking into account physical, material, technological and economic aspects.  document their own constructive proposals for solutions as far as possible in accordance with the standards.  Contents:  Students are taught about the function and structure of machine elements as well as their calculation and design.  Springs: Ordering criteria, spring characteristics, spring work, damping, interaction of springs, Mould rating, metal springs, elastomer springs, gas springs Clutches: Balanced clutches, manual clutches, hydraulic clutches Brakes: Outside shoe and inside shoe brake, disc brake, band brake, friction materials for brake pads Traction gear: Structure and properties of traction elements, criteria for the selection of the traction element, calculation of belt drives, chain drives Gear drives: Theoretical principles of gearing, pinion gearing, helical gears, helical gears, bevel gears, worm drive, materials of the gears, strength calculation, permissible surface pressure, gearbox structure										
4	Forms of teaching: Learning units for self-study, classroom sessions in the form of exercises										
5	Participation requirements:  Formal: -										
	Content:	-		•		•					
6	Forms of assessment:										
7	Written examination or oral examination  Prerequisite for the award of credit points:										
	Module examination pass										
8	Application of the module (in the following study programmes)										

	Mechanical Engineering (part-time combined studies) (B.Eng.);
9	Importance of the grade for the final grade:
	Percentage based on the sum of credits of the graded modules according to RPO- BA §32
10	Module Officer:
	Prof. DrIng. Michael Fahrig
11	Other information:
	-

Ligh	tweight M	laterials							LWS	
Ident	ification er:	Workload:	Credits:	Study	semeste	er:	Frequency offer	of the	Durati	ion:
4069	1	125 h	5	5th se			Annual (Winter)		1 sem	
1	Course:		Planned group siz	zes	Scope	Scope Actual contact time / classroom teaching		Self-stu	ıdy	
	Lecture		60 students		2	SCH	0	h	62.5	h
	Tuition in	n seminars	30 students		0	SCH	0	h	0	h
	Exercise		20 students		2	SCH	16	h	46.5	h
	Practical	or seminar	15 students		0	SCH	0	h	0	h
	Supervise	ed self-study	60 students		0	SCH	0	h	0	h
	construct can expla develop s	ion materials an ain the specific p skills to evaluate	d selecting material d can compare and properties of the material application pot d to apply them in c	analyse terial gro ential of	them wi oups with f differer	th each on the mident the materi	other, crostructure	and the allo	y concep	ot,
3		_			ent design	n.				
3	Contents: Basics of Lightwei, following High-stre Aluminit Magnesit Titanium Composi	relevant materi ght potential and gmaterial group ength steels im alloys im alloys alloys te materials	al parameters for lig	ghtweigl	nt constru	uction to				
3	Contents: Basics of Lightwei following High-stre Aluminit Magnesiu Titanium Composi Applicati	relevant materi ght potential and g material group ength steels um alloys um alloys alloys te materials on examples of	al parameters for lig d special material pr s:	ghtweigh	nt constructions as well	uction to as alloy	ing and mic			
	Contents: Basics of Lightwei following High-stre Aluminiu Magnesiu Titanium Composi Applicati  Forms of Learning Participat Formal:	relevant materi ght potential and g material group ength steels um alloys um alloys alloys te materials on examples of	al parameters for light material programmeters for light material programmeters for light material programmeters for light material materi	ghtweigh	nt constructions as well	uction to as alloy	ing and mic			
4	Contents: Basics of Lightwei following High-stre Aluminiu Magnesiu Titanium Composi Applicati  Forms of Learning Participal Formal: Content: Forms of	relevant materi ght potential and g material group ength steels am alloys am alloys alloys te materials on examples of  teaching: units for self-st tion requiremen  - assessment:	al parameters for light second second material process:  light weight material udy, classroom sessits:	ghtweigh	nt constructions as well	uction to as alloy	ing and mic			
4 5	Contents: Basics of Lightwei, following High-stre Aluminity Magnesity Titanium Composi Applicati  Forms of Learning Participate Formal: Content: Forms of Written e Prerequise	relevant materi ght potential and g material group ength steels am alloys alloys alloys te materials on examples of  teaching: units for self-st tion requiremen  - assessment: examination or osite for the aware	al parameters for light second material prosection of credit points:	ghtweigh	nt constructions as well	uction to as alloy	ing and mic			
4 5	Contents: Basics of Lightwei following High-stre Aluminit Magnesia Titanium Composi Applicati  Forms of Learning Participat Formal: Content: Forms of Written e Prerequis Module e Applicati	relevant materi ght potential and g material group ength steels am alloys alloys alloys te materials on examples of  teaching: units for self-st tion requiremen  assessment: examination or of the for the aware examination pass on of the module	al parameters for light special material prosections:  lightweight material udy, classroom sessests:  oral examination dof credit points: sele (in the following)	ghtweight coperties sions in the study properties study study properties study study properties study s	at constrict as as well when the form	of exerce	ing and mic			
4 5 6 7	Contents: Basics of Lightwei following High-stre Aluminiu Magnesiu Titanium Composi Applicati  Forms of Learning Participat Formal: Content: Forms of Written e Prerequis Module e Applicati Mechanic Importan	relevant materi ght potential and g material group ength steels am alloys alloys at materials on examples of  teaching: units for self-st tion requiremen  - assessment: examination or of site for the award examination pass on of the modul cal Engineering ce of the grade	al parameters for light special material prosections:  lightweight material udy, classroom sessests:  oral examination d of credit points:	ghtweight coperties als ions in the study produced studies.	the form	of exerces)	ing and micr	rostructural		
4 5 6 7 8	Contents. Basics of Lightwei following High-stre Aluminiu Magnesiu Titanium Composi Applicati  Forms of Learning Participal Formal: Content: Forms of Written e Prerequis Module e Applicati Mechanic Importan Percentag  Module C Prof. Dr	relevant materi ght potential and g material group ength steels am alloys am alloys alloys te materials on examples of teaching: units for self-st tion requiremen  - assessment: examination or content for the aware examination pass on of the modul cal Engineering ce of the grade in ge based on the	al parameters for light special material prosections:  lightweight material udy, classroom sessests:  bral examination dof credit points: sele (in the following (part-time combine for the final grade; sum of credits of the	ghtweight coperties als ions in the study produced studies.	the form	of exerces)	ing and micr	rostructural		

Math	nematics I							·	MAT	1
Identi	ification	Workload:	Credits:	Study	semeste	er:	Frequency offer	of the	Durat	ion:
4002		125 h	5	1st se	m.		Annual (Winter)		1 sem	ester
1	Course:		Planned group si	izes	Scope		Actual c / classro teaching		Self-stu	ıdy
	Lecture		60 students		2	SCH	0	h	62.5	h
	Tuition in	seminars	30 students		0	SCH	0	h	0	h
	Exercise		20 students		2	SCH	16	h	46.5	h
	Practical of	or seminar	15 students		0	SCH	0	h	0	h
	Supervise	d self-study	60 students		0	SCH	0	h	0	h
2	Learning	outcomes/comp	petences:		ı			<u> </u>		
_	_		h the different num	ber range	es, as we	ll as the	basics of se	et theory and	element	arv
			etermine the solution							
	numbers.	y are able to a	otorinine the solution	)	mequan	arres arre	i master the	sare manami	5 01 00111	pien
	the most i	mportant speci	asics of real numbe al functions and the s and can apply this	eir charac	cteristic 1	oropertic	es. In additi	are familiar on, they mas	with real ster the d	functions, ifferential
3	Contents:									
3		atala: Numbar i	ranges, set theory, e	lamanta	ry logic	inaguali	itios			
	Complex representa Sequences converger Real func limit and of Special fu trigonome Differenti	numbers: Gaus tition, basic arit is and series: No nce criteria tions: Definitio continuity of re- unctions: Integretric functions	ssian number plane, hmetic operations, umber sequences, p on and representational functions al functions, fractions	polar an exponent properties on of real onal func	d exponentiation, residuation, residuation, residuation, residuation, residuation, exponentiations, residuations, res	ential for pot extra it value as, calcu ponentia	orm, convers action and lo of a sequence lation with real functions,	ogarithmic of ce, infinite so real function logarithm fu	perations eries, s, proper unctions,	ties,
4	Forms of									
			udy, classroom ses	sions in t	ne form	of exerc	cises			
5	Formal:	ion requiremen	ts:							
		-								
	Content:	<u> </u>								
6		assessment: xamination or o	oral examination							
7	Prerequisi	ite for the awar	d of credit points:							
8		xamination pas	s le (in the following	study pr	Ogramm	es)				
o	Electrical	Engineering (p	part-time combined		_		anical Engin	eering (part-	-time	
9		studies) (B.En	g.); for the final grade:							
9	_	-	sum of credits of th	ne graded	l module	s accord	ling to RPO	- BA §32		
10	Module C	officer:								
	Sabine Lü									
11	Other info	ormation:								
	-									

Mat	hematics II	I							MAT	2
Iden	tification ber:	Workload:	Credits:	Study	/ semeste	er:	Frequency offer	of the	Durati	ion:
4006	j.	125 h	5	2nd s	em.		Annual (Summer)		1 sem	ester
1	Course:	1	Planned group s	sizes	Scope	;	Actual co	assroom	Self-stu	ıdy
	Lecture		60 students		2	SCH	0	h	62.5	h
	Tuition in	n seminars	30 students		0	SCH	0	h	0	h
	Exercise		20 students		2	SCH	16	h	46.5	h
		or seminar	15 students		0	SCH	0	h	0	h
		ed self-study	60 students		0	SCH	0	h	0	h
2	Learning	outcomes/com	petences:							
	and can u	ise them to solv	e linear equation sy	ystems.						
3	Contents:		nce behaviour pror	nerties T	avlor ser	ies				
3	Power se Integral c integral c Vector ca product, t Linear al	ries: Converger calculus: Defini calculus, basic o calculus: Vector triple product, v gebra: Calculati nal form, Gauss	nce behaviour, prop te and indefinite in or master integrals, operations, scalar p vectorial representa ing with matrices, r -Jordan method, so	tegrals, in integration product, retion of ge- matrix pro-	ntegration methor methor methor methor method method metric oduct, m	n rules, ods, applional verelation	ication of inctor space, listings or sentation of the content of t	tegral calc inear deper of systems	ulus ndency, ve of linear e	
	Power set Integral content of the Integral content of the Vector can product, to Linear algrow norm determination	ries: Converger calculus: Defini calculus, basic o alculus: Vector triple product, v gebra: Calculati nal form, Gauss ants	te and indefinite in or master integrals, operations, scalar p vectorial representa ing with matrices, 1	tegrals, in integration product, retion of ge- matrix pro-	ntegration methor methor methor methor method method metric oduct, m	n rules, ods, applional verelation atrix rep	ication of inctor space, listings or sentation of the content of t	tegral calc inear deper of systems	ulus ndency, ve of linear e	
3	Power set Integral co integral co Vector ca product, to Linear algrow norm determinate	ries: Converger calculus: Defini calculus, basic o alculus: Vector triple product, v gebra: Calculati nal form, Gauss ants  teaching:	te and indefinite in or master integrals, operations, scalar p vectorial representa ing with matrices, n -Jordan method, so	tegrals, in integration product, retion of go matrix pro- lvability	ntegratio on methon-dimens eometric oduct, m of system	n rules, ods, appl ional ve relation atrix rep ms of lin	ication of in ctor space, li ships cresentation of ear equation	tegral calc inear deper of systems	ulus ndency, ve of linear e	
4	Power set Integral co integral co Vector ca product, t Linear alg row norm determina	ries: Converger calculus: Defini calculus, basic o calculus: Vector triple product, v gebra: Calculati nal form, Gauss ants  teaching: units for self-se	te and indefinite in or master integrals, operations, scalar p vectorial representa ing with matrices, i -Jordan method, so tudy, classroom ses	tegrals, in integration product, retion of go matrix pro- lvability	ntegratio on methon-dimens eometric oduct, m of system	n rules, ods, appl ional ve relation atrix rep ms of lin	ication of in ctor space, li ships cresentation of ear equation	tegral calc inear deper of systems	ulus ndency, ve of linear e	
	Power set Integral co integral co Vector ca product, t Linear alg row norm determina	ries: Converger calculus: Defini calculus, basic o alculus: Vector triple product, v gebra: Calculati nal form, Gauss ants  teaching:	te and indefinite in or master integrals, operations, scalar p vectorial representa ing with matrices, i -Jordan method, so tudy, classroom ses	tegrals, in integration product, retion of go matrix pro- lvability	ntegratio on methon-dimens eometric oduct, m of system	n rules, ods, appl ional ve relation atrix rep ms of lin	ication of in ctor space, li ships cresentation of ear equation	tegral calc inear deper of systems	ulus ndency, ve of linear e	
4	Power set Integral co integral co Vector ca product, t Linear alg row norm determina  Forms of Learning Participat	ries: Converger calculus: Defini calculus, basic o calculus: Vector triple product, v gebra: Calculati nal form, Gauss ants  teaching: units for self-se	te and indefinite in or master integrals, operations, scalar p vectorial representa ing with matrices, i -Jordan method, so tudy, classroom ses	tegrals, in integration product, retion of go matrix pro- lvability	ntegratio on methon-dimens eometric oduct, m of system	n rules, ods, appl ional ve relation atrix rep ms of lin	ication of in ctor space, li ships cresentation of ear equation	tegral calc inear deper of systems	ulus ndency, ve of linear e	
4	Power set Integral contegral contegral content:  Power set Integral contegral contegral content:  Power set Integral contegral content:  Power set Integral content: Integral content:  Integral content:	ries: Converger calculus: Defini calculus, basic o calculus: Vector triple product, v gebra: Calculati cal form, Gauss ants  teaching: units for self-se tion requirement  - assessment:	te and indefinite in or master integrals, operations, scalar p vectorial representa ing with matrices, i -Jordan method, so tudy, classroom ses	tegrals, in integration product, retion of go matrix pro- lvability	ntegratio on methon-dimens eometric oduct, m of system	n rules, ods, appl ional ve relation atrix rep ms of lin	ication of in ctor space, li ships cresentation of ear equation	tegral calc inear deper of systems	ulus ndency, ve of linear e	
4 5	Power set Integral contegral contegral contents:  Power set Integral contegral contents  Forms of Learning Participat Formal: Content: Forms of Written e	ries: Converger calculus: Defini calculus, basic o calculus: Vector triple product, v gebra: Calculati nal form, Gauss ants  teaching: units for self-st tion requirement  - assessment: examination or o	te and indefinite in or master integrals, operations, scalar prectorial representating with matrices, 1-Jordan method, so tudy, classroom sessits:	tegrals, in integration product, retion of go matrix pro- lvability	ntegratio on methon-dimens eometric oduct, m of system	n rules, ods, appl ional ve relation atrix rep ms of lin	ication of in ctor space, li ships cresentation of ear equation	tegral calc inear deper of systems	ulus ndency, ve of linear e	
4 5	Power set Integral contegral contegral contents  Forms of Learning Participate Forms of Learning Participate Forms of Learning Participate Forms of Learning Participate Formal: Forms of Learning Participate Formal: Forms of Learning	ries: Converger calculus: Defini calculus, basic o calculus: Vector triple product, v gebra: Calculati nal form, Gauss ants  teaching: units for self-st tion requirement  - assessment: examination or o	te and indefinite in or master integrals, operations, scalar prectorial representating with matrices, 1-Jordan method, so tudy, classroom sessets:	tegrals, in integration product, retion of go matrix pro- lvability	ntegratio on methon-dimens eometric oduct, m of system	n rules, ods, appl ional ve relation atrix rep ms of lin	ication of in ctor space, li ships cresentation of ear equation	tegral calc inear deper of systems	ulus ndency, ve of linear e	
4 5 6	Power set Integral co integral co vector ca product, to Linear algrow norm determinate Forms of Learning Participate Formal: Content: Forms of Written ee Prerequise Module ee Application	ries: Converger ralculus: Defini ralculus, basic or riculus: Vector riple product, v gebra: Calculati ral form, Gauss reaching: units for self-st tion requirement - assessment: examination or or riculation pass on of the modu	te and indefinite in or master integrals, operations, scalar prectorial representating with matrices, 1-Jordan method, so tudy, classroom sesses.	tegrals, in integration of gometrix product, resolvability	the form	n rules, ods, appl ional ve relation atrix rep ms of lin  of exerce	ication of inctor space, liships presentation of ear equation	tegral calc	ulus ndency, ve of linear e matrices,	
4 5 6	Power set Integral co integral co integral co Vector ca product, to Linear algorithms row norm determinate Forms of Learning Participat Formal: Content: Forms of Written e Prerequis Module e Applicati Electrical combined	ries: Converger ralculus: Defini ralculus; basic of ralculus: Vector riple product, v gebra: Calculati ral form, Gauss reaching: units for self-st tion requirement	te and indefinite in or master integrals, operations, scalar prectorial representating with matrices, 1-Jordan method, so tudy, classroom sesses.  Total examination and of credit points: sesses lie (in the following part-time combined ag.);	tegrals, in integration of gometrix product, resolvability assions in the graph of	the form	n rules, ods, appl ional ve relation atrix rep ms of lin  of exerce	ication of inctor space, liships presentation of ear equation	tegral calc	ulus ndency, ve of linear e matrices,	
4 5 6	Power set Integral co integral co integral co Vector ca product, t Linear algrow norm determina  Forms of Learning Participat Formal: Content: Forms of Written e Prerequis Module e Applicati Electrical combined Importan	ries: Converger calculus: Defini calculus; basic of calculus: Vector triple product, v gebra: Calculati nal form, Gauss ants  teaching: units for self-st tion requirement  - assessment: examination or of cite for the awar examination pass on of the modu I Engineering (I d studies) (B.Er ce of the grade	te and indefinite in or master integrals, operations, scalar prectorial representating with matrices, 1-Jordan method, so tudy, classroom sessits:	tegrals, in integration of gometrix product, resolvability assions in the studies of the studies	the form  rogramm  (B.Eng.)	n rules, ods, appl ional ve relation atrix rep ms of lin  of exerce  es) ); Mecha	ication of incorrection of inc	tegral calc inear deper of systems as, inverse	ulus ndency, ve of linear e matrices,	
4 5 7 8	Power set Integral contegral contegral contegral contents Forms of Learning Participal Formal: Content: Forms of Written en Prerequise Module en Application Importante Percentage Module of Module	ries: Converger ralculus: Definition requirements and control of the modulus range of the grade ge based on the conflicer:	te and indefinite in or master integrals, operations, scalar prectorial representating with matrices, 1-Jordan method, so tudy, classroom sessits:  oral examination ord of credit points: selle (in the following part-time combined ag.); for the final grade:	tegrals, in integration of gometrix product, resolvability assions in the studies of the studies	the form  rogramm  (B.Eng.)	n rules, ods, appl ional ve relation atrix rep ms of lin  of exerce  es) ); Mecha	ication of incorrection of inc	tegral calc inear deper of systems as, inverse	ulus ndency, ve of linear e matrices,	
4 5 6 7 8 9	Power set Integral co integral co integral co Vector ca product, to Linear algrow norm determinate Forms of Learning Participate Formal: Content: Forms of Written e Prerequise Module e Applicati Electrical combined Important Percentage Module C Sabine Linear	ries: Converger ralculus: Definicalculus: Definicalculus: Definicalculus: Vector repeated product, vector repeated product, vector requirements and form, Gauss ants  teaching: units for self-station requirements	te and indefinite in or master integrals, operations, scalar prectorial representating with matrices, 1-Jordan method, so tudy, classroom sessits:  oral examination ord of credit points: selle (in the following part-time combined ag.); for the final grade:	tegrals, in integration of gometrix product, resolvability assions in the studies of the studies	the form  rogramm  (B.Eng.)	n rules, ods, appl ional ve relation atrix rep ms of lin  of exerce  es) ); Mecha	ication of incorrection of inc	tegral calc inear deper of systems as, inverse	ulus ndency, ve of linear e matrices,	

			MICC	nanicai Engine	ering (pa	art-time	COMBI	ned studies	)		
Math	nematics II	Ι								MAT	73
Ident	ification ber:	Workl	oad:	Credits:	Study	semeste	er:	Frequency offer	of the	Durat	ion:
4009		125 h		5	3rd se	em.		Annual (Winter)		1 sem	ester
1	Course:			Planned group s	izes	Scope		Actual c / classro teaching	ontact time om	Self-stu	ıdy
	Lecture			60 students		2	SCH	0	h	62.5	h
	Tuition in	semina	rs	30 students		0	SCH	0	h	0	h
	Exercise			20 students		2	SCH	16	h	46.5	h
	Practical	or semin	ar	15 students		0	SCH	0	h	0	h
	Supervise	ed self-st	udy	60 students		0	SCH	0	h	0	h
	linear diff equations The stude	ferential with con ents know	equation equation equation of the basis	with ordinary differs with constant constant conficients. Since for functions of ferential calculus	oefficient of severa	ts. They	are able es.	to set up an	d solve linea	ar differe	ntial
3	product the of the inh	different neorem, omogene s of seven d total di	fundamer eous equa ral variab afferentia	ions: diff. equ. on tal systems, exp ation, systems of les: Definition an bility, gradient a	onential t linear eq rea, limit	theorem uations value ar	, charact with con nd contin	eristic equat stant coeffice nuity,	ion, oscillati cients	ions, spe	cial solution
4	Forms of			ly, classroom ses	aiona in t	ha fama	of avame	via a a			
5	Participat			•	510115 111 t	ne ioini	or exerc	1505			
5	Formal:	ion requ	-								
	Content:		Master	y of the learning	content o	of the mo	dules M	Iathematics :	and Mather	matics II	
6	Forms of										
7				l examination							
7	_			of credit points:							
0	Module e			(in the following	r etudy se	Ouromm	<b>AC)</b>				
8		Enginee	ering (par	t-time combined		-		anical Engin	eering (part-	time	
9				r the final grade:							
9	•		•	m of credits of the		module	s accord	ling to RPO-	BA §32		
10	Module C	Officer:									
	Sabine Li	ike M.Sc	·.								
11	Other info										
	-										

Mea	surement a	and Control Te	chnology	, , , , , , , , , , , , , , , , , , ,		Comon		,	MUR	T
Iden	tification	Workload:	Credits:	Study	y semeste	er:	Frequency offer	of the	Durati	ion:
4074		125 h	5	7th se	em.		Annual (Winter)		1 sem	ester
1	Course:	1	Planned group si	izes	Scope	:			Self-stu	ıdy
	Lecture		60 students		2	SCH	0	h	62.5	h
	Tuition in	n seminars	30 students		0	SCH	0	h	0	h
	Exercise		20 students		1	SCH	8	h	38.5	h
	Practical	or seminar	15 students		1	SCH	16	h	0	h
	Supervise	ed self-study	60 students		0	SCH	0	h	0	h
2	Learning	outcomes/comp	etences:		· L	I				<u>I</u>
	After suc	cessful completi	ion of the module,	students	will be a	able to				
	• rela	te definitions, ca	alculations and mea	asureme	nts to eac	ch other.	•			
	• dete	ermine electrical	measurands.							
	• dete	ect and interpret	measurement error	rs.						
		_	re of important elec		easuring	instrum	ents.			
			experiments themse							
3	Contents:	• •								
	Basics of Definition Measurer Structure, Digital sto Power an	measuring elections and calculation ment deviations, function and prorage oscilloscod energy measurial arrangements	ons of time average and measurement u roperties of analogo pes rement	es incertair	nties					
4	Forms of	teaching:								
	Learning	units for self-st	udy, classroom eve	nts in th	e form o	f exercis	ses and pract	icals		
5		ion requirement	es:							
	Formal:	-								
	Content:	-								
6		assessment:								
			ral examination							
7	_		d of credit points:							
0			s and course assess e (in the following		no (rec 227	05)		_		_
8	~ ~		e (in the following (part-time combine		-					
9			for the final grade:	a stualt	<i>э)</i> ( <b>D.</b> EII)	5./,				
J	_		sum of credits of th	e gradeo	d module	s accord	ling to RPO-	BA §32		
10	Module C		T 00							
		Ing. Sebastian I	Hoffmann							
11	Other info	ormation:								
	-									

Phys	ics									PHY	1
Ident	ification per:	Workload:		Credits:	Study	semeste	er:	Frequency offer	of the	Durati	ion:
4004		125 h		5	2nd se	em.		Annual (Summer)		1 sem	ester
1	Course:		Pla	anned group siz	es	Scope		Actual c time / cla teaching	assroom	Self-stu	ıdy
	Lecture		60	students		2	SCH	0	h	62.5	h
	Tuition in	seminars	30	students		0	SCH	0	h	0	h
	Exercise		20	students		1	SCH	8	h	38.5	h
	Practical	or seminar	15	students		1	SCH	16	h	0	h
	Supervise	ed self-study	60	students		0	SCH	0	h	0	h

#### 2 Learning outcomes/competences:

#### Students:

- are familiar with the SI system and confidently transform physical quantities and units.
- understand the nature of a physical measurement process.
- recognise basic physical relationships.
- solve simple kinematic and dynamic problems using the basic equations.
- understand the meaning of physical conservation laws and are able to apply them.
- know the basic phenomena of acoustics and optics and can reproduce them.
- carry out physical experiments and evaluate the results.
- write laboratory reports according to the general method.

#### 3 Contents:

Basic concepts of physics:

Systematics of physical quantities, SI units, definition of elementary physical quantities (e.g. length, time, mass, density, force, pressure, mechanical stress, temperature, heat capacity, viscosity)

Physical measurement process:

Measurement systems, graphical representations, measurement deviation and error propagation

Basic kinematic variables in translation and rotation (location, angle of rotation, (angular) velocity, (angular) acceleration, path-time diagrams, uniform (rotary) motion, uniformly accelerated (rotary) motion Dynamics:

Newton's axioms, inertial mass, moment of inertia, gravitation, mechanical forces, friction, apparent forces (centripetal force, Coriolis force)

Physical work and energy:

Definition of work, energy, power, efficiency and effectiveness; forms of energy, law of conservation of energy with applications

Momentum and angular momentum:

Definition of momentum and angular momentum, connection with forces and moments, law of conservation of momentum and angular momentum with applications

Elementary vibration theory:

Periodic processes, kinematics and dynamics of harmonic oscillations, undamped and damped, free and forced oscillation

Elementary wave phenomena using the examples of acoustics and optics

Technical acoustics:

Sound waves and superposition, sound propagation, sound pressure, sound level and A-weighting, sound attenuation and sound insulation

Optics:

Wave optics (interference and diffraction, reflection, transmission, refraction, total refraction), geometrical optics (optical imaging, simple optical instruments)

4	Forms of teaching	;:
	Learning units for	self-study, classroom events in the form of exercises and practicals
5	Participation requ	irements:
	Formal:	-
	Content:	-
6	Forms of assessm	ent:
	Written examinati	on or oral examination
7	Prerequisite for th	e award of credit points:
	Module examinat	ion pass and course assessment
8	Application of the	e module (in the following study programmes)
	Mechanical Engir	neering (part-time combined studies) (B.Eng.);
9	Importance of the	grade for the final grade:
	Percentage based	on the sum of credits of the graded modules according to RPO- BA §32
10	Module Officer:	
	N. N.	
11	Other information	:
	-	

Proc	luct Risk M	<b>I</b> anagement							PUR	
Iden num	tification ber:	Workload:	Credits:	Study	semeste	er:	Frequency offer	of the	Durati	ion:
4067	1	125 h	5	7th se	em.		Annual (Winter)		1 sem	ester
1	Course:		Planned group si	izes	Scope		Actual co / classroo teaching	ontact time om	Self-stu	ıdy
	Lecture		60 students		2	SCH	0	h	62.5	h
	Tuition in	seminars	30 students		0	SCH	0	h	0	h
	Exercise		20 students		2	SCH	16	h	46.5	h
	Practical	or seminar	15 students		0	SCH	0	h	0	h
	Supervise	ed self-study	60 students		0	SCH	0	h	0	h
			evelop instruments under technical and							
3	Contents:									
3	Risk type	s/ risk identifica	ation and risk ranking							
3	Risk type Methods Methods	s/ risk identifica of risk analysis of technical risk	and risk ranking assessment							
3	Risk type Methods Methods Instrumer	s/ risk identifica of risk analysis of technical risk nts and processe	and risk ranking c assessment es of risk manageme							
3	Risk type Methods Methods Instrumer Integration Instrumer	s/ risk identification of risk analysis of technical risk and processed on of risk managents of evaluation	and risk ranking assessment	duct dev	elopmen	t cycle				
3	Risk type Methods Methods Instrumer Integratio Instrumer Forms of	s/ risk identification of risk analysis of technical risk and processed on of risk managents of evaluation teaching:	and risk ranking c assessment es of risk management gement into the process and documentation	duct dev		•				
4	Risk type Methods Methods Instrumer Integration Instrumer Forms of Learning	s/ risk identification of risk analysis of technical risk and processed on of risk managents of evaluation teaching: units for self-st	and risk ranking c assessment es of risk manageme gement into the process and documentatio udy, classroom sess	duct dev		•	ises			
	Risk type Methods Methods Instrumer Integratio Instrumer Forms of Learning	s/ risk identification of risk analysis of technical risk and processed on of risk managents of evaluation teaching: units for self-stion requiremen	and risk ranking c assessment es of risk manageme gement into the process and documentatio udy, classroom sess	duct dev		•	ises			
4	Risk type Methods Methods Instrumer Integratio Instrumer Forms of Learning Participat Formal:	s/ risk identification of risk analysis of technical risk and processed on of risk managents of evaluation teaching: units for self-station requirements	and risk ranking c assessment es of risk manageme gement into the process and documentatio udy, classroom sess	duct dev		•	ises			
4 5	Risk type Methods Methods Instrumer Integratio Instrumer Forms of Learning Participat Formal: Content:	s/ risk identification of risk analysis of technical risk and processed on of risk managents of evaluation teaching: units for self-station requirements	and risk ranking c assessment es of risk manageme gement into the process and documentatio udy, classroom sess	duct dev		•	ises			
4	Risk type Methods Methods Instrumer Integratio Instrumer Forms of Learning Participat Formal: Content: Forms of	s/ risk identification of risk analysis of technical risk and processed on of risk managents of evaluation teaching: units for self-station requirements	and risk ranking c assessment es of risk manageme gement into the proc n and documentatio udy, classroom sess ts:	duct dev		•	ises			
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4 5	Risk type Methods Methods Instrumer Integration Instrumer Forms of Learning Participat Formal: Content: Forms of Written o Prerequis	s/ risk identification of risk analysis of technical risk and processed on of risk managents of evaluation teaching: units for self-station requirements	and risk ranking c assessment es of risk manageme gement into the produced and documentation udy, classroom sessesses:  ion or term paper d of credit points:	duct dev		•	ises			
4 5	Risk type Methods Methods Instrumer Integration Instrumer Forms of Learning Participat Formal: Content: Forms of Written o Prerequis Module e	s/ risk identification of risk analysis of technical risk and processed on of risk managents of evaluation teaching: units for self-stion requirement	and risk ranking c assessment es of risk manageme gement into the produced and documentation udy, classroom sessesses:  ion or term paper d of credit points:	duct deven	the form	of exerc	ises			
4 5 6	Risk type Methods Methods Instrumer Integration Instrumer Forms of Learning Participat Formal: Content: Forms of Written o Prerequis Module e Application	s/ risk identification of risk analysis of technical risk and processed on of risk managets of evaluation teaching: units for self-stion requirement	and risk ranking c assessment es of risk manageme gement into the prod n and documentatio udy, classroom sess ts:  ion or term paper d of credit points: s	duct deven	the form	of exerce		eering (part-	-time	
5 6 7 8	Risk type Methods Methods Instrumer Integration Instrumer Forms of Learning Participat Formal: Content: Forms of Written o Prerequis Module e Application Electrical combined	s/ risk identification of risk analysis of technical risk and processed on of risk managets of evaluation teaching: units for self-stion requirement	and risk ranking c assessment es of risk manageme gement into the proof n and documentatio udy, classroom sess ts:  ion or term paper d of credit points: s le (in the following part-time combined g.);	duct deven	the form	of exerce		eering (part-	-time	
4 5 6	Risk type Methods Methods Instrumer Integratio Instrumer Forms of Learning Participat Formal: Content: Forms of Written o Prerequis Module e Application Electrical combined Importance	s/ risk identification of risk analysis of technical risk and processed on of risk managets of evaluation teaching: units for self-station requirement	and risk ranking c assessment es of risk manageme gement into the proof n and documentatio udy, classroom sess ts:  ion or term paper d of credit points: s le (in the following part-time combined	study pr	rogramm (B.Eng.)	of exerce	nical Engin		-time	
4 5 6 7 8	Risk type Methods Methods Instrumer Integratio Instrumer Forms of Learning Participat Formal: Content: Forms of Written o Prerequis Module e Application Electrical combined Importance Percentage	s/ risk identification of risk analysis of technical risk and processed on of risk managets of evaluation teaching: units for self-station requirement	and risk ranking c assessment es of risk manageme gement into the proc n and documentatio udy, classroom sess ts:  ion or term paper d of credit points: s le (in the following part-time combined g.); for the final grade:	study pr	rogramm (B.Eng.)	of exerce	nical Engin		-time	
5 6 7 8	Risk type Methods Methods Instrumer Integratio Instrumer Forms of Learning Participat Formal: Content: Forms of Written o Prerequis Module e Application Important Percentage Module C	s/ risk identification of risk analysis of technical risk and processed on of risk managets of evaluation teaching: units for self-station requirement	and risk ranking c assessment es of risk manageme gement into the proc n and documentatio udy, classroom sess ts:  ion or term paper d of credit points: s le (in the following part-time combined g.); for the final grade: sum of credits of th	study pr	rogramm (B.Eng.)	of exerce	nical Engin		-time	
4 5 6 7 8	Risk type Methods Methods Instrumer Integratio Instrumer Forms of Learning Participat Formal: Content: Forms of Written o Prerequis Module e Application Important Percentage Module C	s/ risk identification of risk analysis of technical risk and processed on of risk managets of evaluation teaching: units for self-station requirement in the control of the award axamination passed on of the module. Engineering (plastudies) (B.Enge of the grade for th	and risk ranking c assessment es of risk manageme gement into the proc n and documentatio udy, classroom sess ts:  ion or term paper d of credit points: s le (in the following part-time combined g.); for the final grade:	study pr	rogramm (B.Eng.)	of exerce	nical Engin		-time	

Production Automation and Digitalisation    Jedintification   Workload:   Credits:   Study semester:   Frequency of the offer   Duration: umber:			IVIC	echanical Engine	ering (p	art-time	COIIIOI	ned studies	) 		
number: 4072   125 h   5   8th sem.   Offer   Annual (Gummer)   1 semester (Gummer)    1   Course:   Planned group sizes   Scope   Actual contact time / classroom teckning   Lecture   60 students   2   SCH   0   h   62.5   h    1   Lecture   60 students   2   SCH   0   h   62.5   h    1   Lecture   50 students   2   SCH   0   h   0   h   62.5   h    1   Lecture   50 students   2   SCH   0   h   0   h   62.5   h    2   Scrise   20 students   2   SCH   16   h   46.5   h    2   Practical or seminar   15 students   0   SCH   0   h   0   h   0   h    3   Supervised self-study   60 students   0   SCH   0   h   0   h   0   h    4   Learning outcomes/competences:   Students   0   SCH   0   h   0   h   0   h    5   Learning outcomes/competences:   Students   0   SCH   0   h   0   h    5   Learning outcomes/competences:   Students   0   SCH   0   h   0   h    6   Can classify basic technologies of production automation and digitalisation in the context of the buzzword "Industry 4.0", as well as critically question their implementation possibilities   understand the key principles behind the concepts of a "factory of the future"   can assess the potential and degree of complexity of forward-looking production scenarios    5   Contents:   The module first provides an insight into the structure, business processes and set-up of a company. It deals with important topics of today's factory organisation.   In the further course, students are taught the essential technology drivers behind the buzzword 'Industry 4.0", Building on the technologies presented, an outlook is given on the production of the future as predicted by many experts. Real-life examples will be used to present aspects of this vision of the future that are already being implemented today.   Fundamentals of production, especially in the context of automation   Requirements of the factory/production for product automation   Requirements of the factory production for product automation   Basic technologies 40   3D Printers - Cyber Physical System - Sensitive Robo	Prod	uction Aut	tomation and l	Digitalisation						PAU	D
Course:   Planned group sizes   Scope   Actual contact time / classroom teaching			Workload:	Credits:	Study	y semeste	er:		of the	Durat	ion:
Lecture 60 students 2 SCH 0 h 62.5 h Tutiton in seminars 30 students 0 SCH 0 h 62.5 h Exercise 20 students 2 SCH 16 h 46.5 h Practical or seminar 15 students 0 SCH 0 h 0 h 0 h  Exercise 20 students 0 SCH 0 h 0 h 0 h  Supervised self-study 60 students 0 SCH 0 h 0 h 0 h  Supervised self-study 60 students 0 SCH 0 h 0 h 0 h  Learning outcomes/competences:  Students:  • can reproduce the basics of current factory organisations • can classify basic technologies of production automation and digitalisation in the context of the buzzword "Industry 4.0", as well as critically question their implementation possibilities • understand the key principles behind the concepts of a "factory of the future" • can assess the potential and degree of complexity of forward-looking production scenarios  Contents:  The module first provides an insight into the structure, business processes and set-up of a company. It deals with important topics of today's factory organisation.  In the further course, students are tugbit the essential technology drivers behind the buzzword "Industry 4.0".  Building on the technologies presented, an outlook is given on the production of the future as predicted by many experts. Real-life examples will be used to present aspects of this vision of the future that are already being implemented today.  Fundamentals of production, especially in the context of automation  Requirements of the factory/production for product automation  Basic technologies 4.0  3D Printers - Cyber Physical System - Sensitive Robots - Human-Machine Interaction - Big Data - Cloud Computing - Real Time Enterprise - Vertical/Horizontal Integration - Digital Factory - Predictive Maintenance  Concepts of the factory of the future  Digital business processes - Production system - Decentralised coordination - Management processes - Open value chain - Flexible production - Global activities (Advanced Manufacturing, Industry 4.0, Intelligent Manufacturing, e- Factory)  The human factor in digitalised industry  Assistance systems  Process	4072		125 h	5	8th s	em.				1 sem	ester
Lecture 60 students 2 SCH 0 h 62.5 h Tuition in seminars 30 students 0 SCH 0 h 62.5 h Exercise 20 students 2 SCH 16 h 46.5 h Practical or seminar 15 students 0 SCH 0 h 0 h 0 h  Learning outcomes/competences: Students: 0 SCH 0 h 0 h 0 h  Learning outcomes/competences: Students: 0 can reproduce the basics of current factory organisations  can classify basic technologies of production automation and digitalisation in the context of the buzzword "Industry 4.0", as well as critically question their implementation possibilities  can assess the potential and degree of complexity of forward-looking production scenarios  Contents:  The module first provides an insight into the structure, business processes and set-up of a company. It deals with important topics of today's factory organisation.  In the further course, students are taught the essential technology drivers behind the buzzword "Industry 4.0". Building on the technologies presented, an outdook is given on the production of the future that are already being implemented today. Fundamentals of production, especially in the context of automation Requirements of the factory/production for product automation Requirements of the factory/production for product automation Basic technologies 4.0 3D Printers - Cyber Physical System - Sensitive Robots - Human-Machine Interaction - Big Data - Cloud Computing - Real Time Enterprise - Vertical/Horizontal Integration - Digital Factory - Predictive Maintenance Concepts of the factory of the future Digital business processes - Production system - Decentralised coordination - Management processes - Open value chain - Flexible production - Global activities (Advanced Manufacturing, Industry 4.0, Intelligent Manufacturing, e- Factory) The human factor in digitalised industry Assistance systems Process monitoring as an essential component in the automation of networked production systems. Sensors, monitoring strategies through to teleservice Resource-efficient production Exemplary implementations in companies In the exercises,	1	Course:		Planned group s	sizes	Scope		time / cla	assroom	Self-stu	ıdy
Tuition in seminars 30 students 0 SCH 0 h 0 h 46.5 h Exercise 20 students 2 SCH 16 h 46.5 h Practical or seminar 15 students 0 SCH 0 h 0 h 0 h  Supervised self-study 60 students 0 SCH 0 h 0 h 0 h  Supervised self-study 60 students 0 SCH 0 h 0 h 0 h  Learning outcomes/competences: Students:  • can reproduce the basics of current factory organisations • can classify basic technologies of production automation and digitalisation in the context of the buzzword "Industry 4.0", as well as critically question their implementation possibilities • understand the key principles heind the concepts of a "factory of the future" • can assess the potential and degree of complexity of forward-looking production scenarios  3 Contents: The module first provides an insight into the structure, business processes and set-up of a company. It deals with important topics of today's factory organisation. In the further course, students are taught the essential technology drivers behind the buzzword "Industry 4.0". Building on the technologies presented, an outlook is given on the production of the future as predicted by many experts. Real-life examples will be used to present aspects of this vision of the future that are already being implemented today. Fundamentals of production, especially in the context of automation Requirements of the factory/production for product automation Basic technologies 4.0 3D Printers - Cyber Physical System - Sensitive Robots - Human-Machine Interaction - Big Data - Cloud Computing - Real Time Enterprise - Vertical/Horizontal Integration - Digital Factory - Predictive Maintenance Concepts of the factory of the future Digital business processes - Production system - Decentralised coordination - Management processes - Open value chain - Flexible production - Global activities (Advanced Manufacturing, Industry 4.0, Intelligent Manufacturing, e- Factory) The human factor in digitalised industry Assistance systems Process monitoring as an essential component in the automation of networked production system		Lecture		60 students		2	SCH			62.5	h
Practical or seminar		Tuition in	seminars	30 students		0		0	h	0	h
Supervised self-study  60 students  0 SCH 0 h 0 h  0 h  2 Learning outcomes/competences:  Students:  • can reproduce the basics of current factory organisations  • can classify basic technologies of production automation and digitalisation in the context of the buzzword "Industry 4.0"; as well as critically question their implementation possibilities  • understand the key principles behind the concepts of a "factory of the future"  • can assess the potential and degree of complexity of forward-looking production scenarios  Contents:  The module first provides an insight into the structure, business processes and set-up of a company. It deals with important topics of today's factory organisation.  In the further course, students are taught the essential technology drivers behind the buzzword "Industry 4.0". Building on the technologies presented, an outlook is given on the production of the future as predicted by many experts. Real-life examples will be used to present aspects of this vision of the future that are already being implemented today.  Fundamentals of production, especially in the context of automation  Requirements of the factory/production for product automation  Basic technologies 4.0  3D Printers - Cyber Physical System - Sensitive Robots - Human-Machine Interaction - Big Data - Cloud Computing - Real Time Enterprise - Vertical/Horizontal Integration - Digital Factory - Predictive Maintenance  Concepts of the factory of the future  Digital business processes - Production system - Decentralised coordination - Management processes - Open value chain - Flexible production - Global activities (Advanced Manufacturing, Industry 4.0, Intelligent Manufacturing, e- Factory)  The human factor in digitalised industry  Assistance systems  Process monitoring as an essential component in the automation of networked production systems. Sensors, monitoring strategies through to teleservice  "Resource-efficient production"  Exemplary implementations in companies  In the exercises, the methods are applied to i		Exercise		20 students		2	SCH	16	h	46.5	h
2 Learning outcomes/competences: Students:  • can reproduce the basics of current factory organisations  • can classify basic technologies of production automation and digitalisation in the context of the buzzword "Industry 4.0", as well as critically question their implementation possibilities  • understand the key principles behind the concepts of a "factory of the future"  • can assess the potential and degree of complexity of forward-looking production scenarios  Contents:  The module first provides an insight into the structure, business processes and set-up of a company. It deals with important topics of today's factory organisation.  In the further course, students are taught the essential technology drivers behind the buzzword "Industry 4.0". Building on the technologies presented, an outlook is given on the production of the future as predicted by many experts. Real-life examples will be used to present aspects of this vision of the future that are already being implemented today.  Fundamentals of production, especially in the context of automation Requirements of the factory/production for product automation Basic technologies 4.0  3D Printers - Cyber Physical System - Sensitive Robots - Human-Machine Interaction - Big Data - Cloud Computing - Real Time Enterprise - Vertical/Horizontal Integration - Digital Factory - Predictive Maintenance  Concepts of the factory of the future  Digital business processes - Production system - Decentralised coordination - Management processes - Open value chain - Flexible production - Global activities (Advanced Manufacturing, Industry 4.0, Intelligent Manufacturing, e- Factory)  The human factor in digitalised industry Assistance systems  Process monitoring as an essential component in the automation of networked production systems. Sensors, monitoring strategies through to teleservice  "Resource-efficient production"  Exemplary implementations in companies  In the exercises, the methods are applied to industry-related tasks through the use of modern IT tools and		Practical	or seminar	15 students		0	SCH	0	h	0	h
Students:		Supervise	ed self-study	60 students		0	SCH	0	h	0	h
The module first provides an insight into the structure, business processes and set-up of a company. It deals with important topics of today's factory organisation.  In the further course, students are taught the essential technology drivers behind the buzzword "Industry 4.0". Building on the technologies presented, an outlook is given on the production of the future as predicted by many experts. Real-life examples will be used to present aspects of this vision of the future that are already being implemented today.  Fundamentals of production, especially in the context of automation Requirements of the factory/production for product automation Basic technologies 4.0  3D Printers - Cyber Physical System - Sensitive Robots - Human-Machine Interaction - Big Data - Cloud Computing - Real Time Enterprise - Vertical/Horizontal Integration - Digital Factory - Predictive Maintenance  Concepts of the factory of the future  Digital business processes - Production system - Decentralised coordination - Management processes - Open value chain - Flexible production - Global activities (Advanced Manufacturing, Industry 4.0, Intelligent Manufacturing, e- Factory,)  The human factor in digitalised industry Assistance systems  Process monitoring as an essential component in the automation of networked production systems. Sensors, monitoring strategies through to teleservice "Resource-efficient production"  Exemplary implementations in companies In the exercises, the methods are applied to industry-related tasks through the use of modern IT tools and throug exercises in the InProSys learning factory, as well as supplemented with examples from industry and solution providers.  4 Forms of teaching: Learning units for self-study, classroom sessions in the form of exercises	2	Students:	reproduce the beclassify basic to lustry 4.0", as werstand the key	pasics of current facechnologies of provell as critically que principles behind to	duction a estion the	nutomation eir imple epts of a	on and d mentation "factory	on possibilit of the future	ies e"		buzzword
Learning units for self-study, classroom sessions in the form of exercises		deals with In the fur Building many exp being imp Fundame. Requirem Basic tech 3D Printe Computir Maintena Concepts Digital buvalue cha Manufact The huma Assistanc Process n monitorin "Resource Exemplar In the exe exercises"	n important topither course, studenther course, studenther course, studenther course, studenther course, seal-life explemented today natals of product tents of the factory	cs of today's factor dents are taught the gies presented, an examples will be used.  ion, especially in the cory/production for the future are a Production system oduction - Global are a grant ough to teleservice uction" one in companies ands are applied to	ry organie e essentia outlook i seed to pro he conte product sitive Rol al/Horizo tem - De activities ent in the e industry	isation. al techno is given of esent asp  xt of auto automati bots - Hu ontal Inte  centralise (Advance e automati	logy driven the precedence of	vers behind roduction of his vision of his vision of achine Interaction - Maufacturing, I etworked proough the use	the buzzwo the future a the future action - Big etory - Pred anagement ndustry 4.0	ord "Indus: as predicte that are al grant and a grant	try 4.0".  Ed by ready  oud  Open nt  nsors,
	4	Forms of	teaching:								
				•	ssions in	the form	of exerc	cises			

	Formal:	-
	Content:	-
6	Forms of assessm	ent:
	Written or oral ex	amination or project work
7	Prerequisite for th	e award of credit points:
	Module examinati	ion pass
8	Application of the	e module (in the following study programmes)
	Mechanical Engin	neering (part-time combined studies) (B.Eng.);
9	Importance of the	grade for the final grade:
	Percentage based	on the sum of credits of the graded modules according to RPO- BA §32
10	Module Officer:	
	Prof. DrIng. Jürg	gen Sauser
11	Other information	
	-	

	uction Ma	nagement and	Factory Organisa	ition					PMU	S
Identi	ification er:	Workload:	Credits:	Study	semeste	er:	Frequency offer	of the	Durati	ion:
4070		125 h	5	7th se	m.		Annual (Winter)		1 sem	ester
1	Course:		Planned group si	zes	Scope		Actual co	ontact time om	Self-stu	ıdy
	Lecture		60 students		2	SCH	0	h	62.5	h
	Tuition in	seminars	30 students		0	SCH	0	h	0	h
	Exercise		20 students		2	SCH	16	h	46.5	h
	Practical	or seminar	15 students		0	SCH	0	h	0	h
	Supervise	d self-study	60 students		0	SCH	0	h	0	h
3	oriented r	nanner in every on in practice.	also be able to appl day business life. T	hey can	apply th	eir know	vledge of lea	n managem	ent and f	actory
	Basics of Process d Integratio	efinitions and I	ndustrial application Γ systems to suppor							1)
		al Factory	s of the factory of to	omorrow	1					-,
4	Perspectiv	al Factory ves and outlook		omorrow	7					
4	Perspective Forms of	al Factory wes and outlooks teaching:				of exerc	ises			
4 5	Perspective Forms of Learning	al Factory wes and outlooks teaching:	s of the factory of to			of exerc	ises			
	Forms of Learning Participat Formal:	al Factory ves and outlook teaching: units for self-str	s of the factory of to			of exerc	ises			
	Perspective Forms of Learning Participat	al Factory ves and outlook teaching: units for self-str ion requirement	s of the factory of to			of exerc	ises			
	Forms of Learning Participat Formal: Content:	al Factory ves and outlooks teaching: units for self-str ion requirement assessment:	s of the factory of to			of exerc	ises			
5	Forms of Learning Participat Formal: Content: Forms of Written o	al Factory ves and outlooks teaching: units for self-str ion requirement	s of the factory of to			of exerc	ises			
5	Forms of Learning Participat Formal: Content: Forms of Written o	al Factory ves and outlooks teaching: units for self-str ion requirement assessment: r oral examinati ite for the award	s of the factory of to ady, classroom sess s: on or project work I of credit points:			of exerc	ises			
5 6 7	Forms of Learning Participat Formal: Content: Forms of Written o Prerequis Module e	al Factory ves and outlook teaching: units for self-str ion requirement	ady, classroom sesses:  on or project work of credit points:	ions in t	he form		ises			
5	Forms of Learning Participat Formal: Content: Forms of Written o Prerequis Module e Application	al Factory ves and outlook teaching: units for self-str ion requirement - assessment: r oral examinati ite for the award xamination pass on of the modul	ady, classroom sess s: on or project work l of credit points: s e (in the following	ions in t	he form	es)	ises			
5 6 7	Forms of Learning Participat Formal: Content: Forms of Written o Prerequis Module e Application Mechanical Perspective Programme Program	al Factory ves and outlook teaching: units for self-str ion requirement  - assessment: r oral examinati ite for the award xamination pass on of the modul al Engineering	ady, classroom sesses:  on or project work of credit points:	ions in t	he form	es)	ises			
5 6 7 8	Forms of Learning Participat Formal: Content: Forms of Written o Prerequis Module e Application Mechanic Important	al Factory ves and outlooks teaching: units for self-str ion requirement  - assessment: r oral examinati ite for the award xamination pass on of the modul al Engineering te of the grade f	on or project work of the following (part-time combine	study produces	ogramm	es) g.);		BA §32		
5 6 7 8	Forms of Learning Participat Formal: Content: Forms of Written o Prerequis Module e Application Mechanic Important Percentag Module C	al Factory ves and outlooks teaching: units for self-strion requirement  - assessment: r oral examination pass on of the modul al Engineering te of the grade for the self-stricer:	on or project work of the following (part-time combine for the final grade: sum of credits of the	study produces	ogramm	es) g.);		BA §32		
5 6 7 8	Forms of Learning Participat Formal: Content: Forms of Written o Prerequis Module e Application Mechanic Important Percentag Module C	al Factory ves and outlooks teaching: units for self-str ion requirement  - assessment: r oral examination pass on of the modul al Engineering the of the grade for the self-str ice of the grade for the self-str ice based on the self-str Officer: Ing. Jürgen Sau	on or project work of the following (part-time combine for the final grade: sum of credits of the	study produces	ogramm	es) g.);		BA §32		

Proj	ect Manag	ement							PM		
Ident	tification ber:	Workload:	Credits:	Study	semeste	er:	Frequency offer	of the	Durati	Duration:	
4029		125 h	5	8th se	em.		Annual (Summer)		1 sem	1 semester	
1	Course:		Planned group s	Planned group sizes Scope  60 students 2 SCH 30 students 0 SCH		actual Contact time / classroom teaching		Self-study			
	Lecture		60 students			SCH	0 h		62.5	h	
	Tuition in	n seminars	30 students			SCH	0	h	0	h	
	Exercise		20 students		0	SCH	16	h	46.5	h	
		or seminar	15 students			SCH	0	h	0	h	
	Supervise	ed self	60 students		0	SCH	0	h	0	h	
	Students are able to		tasks of project organisation and project management d procedure for working on projects a given procedural project organisation are and schedule planning with network plans and draw up capacity and color k plans ry technical vocabulary regarding project organisation and project manage as of team building and project management successfully motivate oneself and teams effectively.					ty and cost	planning o		
3	• exp They unc They unc cultures.	olain the speciful derstand how to derstand the im	ics of team building o successfully motiv aportance of corporat	and proj ate onese te goals a	ect mana	eams effe ble to di	ectively. stinguish be				
3	They und cultures.  Contents The basid Terms ar managen Project p completic Project n Tools of Project n Social, te Innovation Self-man	elain the specific derstand how to derstand the immediate and practical definition, an ent hases and planton) nanagement in project management as echnical and mon and change tagement	o successfully motive apportance of corporate application of project	and proj ate oneso te goals a ect mana olving an ct prepar	ect mana elf and te and are a gement a d decisio	eams effi ble to di	ectively. stinguish be ented ng processes	tween dif	ferent leade	ership n and proje	
3	They und They und cultures.  Contents The basid Terms ar managen Project p completic Project n Tools of Project n Social, te Innovatid Self-man Target tra	elain the specific derstand how to derstand the important the important definition, and the second definition and placet management as exchanged and the second definition and change lagement acking and professions.	l application of projects of problem-son systems (project the organisational stement a management tool ethodological compensations)	and proj ate onese te goals a ect mana olving an ect prepar tructure	ect mana elf and te and are a gement a d decision	eams effe ble to di are prese on-makin	ectively. stinguish be ented ng processes nning, proje	tween dif	ferent leade	ership n and proje	
	They und They und Cultures.  Contents The basid Terms ar managen Project p completin Project in Tools of Project in Social, te Innovation Self-man Target transport of Learning Participa Formal:	elain the specific derstand how to derstand the important the important definition, and the second definition and placet management as exchanged and the second definition and change lagement acking and professions.	o successfully motive apportance of corporate application of project spects of problem-source amanagement tool ethodological compensational stems a management tool ethodological compensational stems are applicated to the organisational stems amanagement tool ethodological compensational stems are applicated to the organisational stems are applicated to the organisational stems are applicated to the organisation and the organisation application applications are applicated to the organisation application and the organisation application applications are applicated to the organisation and the organisation application applicat	and proj ate onese te goals a ect mana olving an ect prepar tructure	ect mana elf and te and are a gement a d decision	eams effe ble to di are prese on-makin	ectively. stinguish be ented ng processes nning, proje	tween dif	ferent leade	ership n and proje	
4	They und cultures.  Contents The basic Terms ar managen Project p completic Project n Tools of Project n Social, te Innovation Self-man Target trans Forms of Learning Participa Formal: Content: Forms of	clain the specific derstand how to derstand the important the important definition, and definition, and definition, and definition, and definition and definition and definition and change described and properties acking a control of the propertie	l application of project the organisational stement a management tool ethodological compensational stement a management spect controlling	and proj ate oneso te goals a ect mana olving an et prepar tructure etence	ect mana elf and te and are a gement a d decision	eams effe ble to di are prese on-makin	ectively. stinguish be ented ng processes nning, proje	tween dif	ferent leade	ership n and proje	
4 5 5	They und they und cultures.  Contents The basid Terms are managen Project project notes to the social, te Innovation Self-man Target transfer trans	clain the specific derstand how to derstand the important the important definition, and the second definition and plant and the second definition and change the second definition and the second defi	l application of project ward of credit points:	and proj ate oneso te goals a ect mana olving an et prepar tructure etence	ect mana elf and te and are a gement a d decision	eams effe ble to di are prese on-makin	ectively. stinguish be ented ng processes nning, proje	tween dif	ferent leade	ership n and proje	
4 5 6	They und They und cultures.  Contents The basid Terms ar managen Project project not social, te Innovatid Self-man Target traffic Terms of Learning Participa Formal: Content: Forms of Oral example Project not the social of Project not social, te Innovatid Self-man Target traffic Terms of Learning Participa Formal: Content: Forms of Oral example Prerequising Module of Application	clain the specific derstand how to derstand the important the important definition, and the second definition and plant project management as second and the second definition and the second definition requirement in the second definition of the second definition of the second definition of the second definition definition of the second definition d	l application of project ward of credit points:	and projecte goals are oneset mana polying an extructure etence	gement ad decision ation, pro	are presecon-makin	ectively. stinguish be ented ng processes nning, proje	tween dif	preganisation presentation, presentation, presentation, presentation p	ership n and proje	

	Percentage based on the sum of credits of the graded modules according to RPO- BA §32
10	Module Officer:
	Prof. DrIng. Michael Fahrig
11	Other information:
	-

			chanical Engine	, time (p.				,		
Qual	ity Manago	ement							QMM	1
Identi numb	fication er:	Workload:	Credits:	Study	semeste	er:	Frequency offer	of the	Durat	ion:
4033		125 h	5	9th se	em.		Annual (Winter)		1 semester	
1	Course:		Planned group s	sizes	Scope		Actual c / classro teaching		Self-stu	ıdy
	Lecture		60 students		2	SCH	0	h	62.5	h
	Tuition in	seminars	30 students		0	SCH	0	h	0	h
	Exercise		20 students		1	SCH	8	h	38.5	h
	Practical of	or seminar	15 students		1	SCH	16	h	0	h
	Supervise	ed self-study	60 students		0	SCH	0	h	0	h
3	intro     intro     intro     shap     appl     Furthermo     appl     orde     unde     pres     with  Contents: The stude     customer     Basic con     Quality, a     Standardi: DIN EN I     Process-o     Measuren     system, in     Environm     Customer     Continuou     Basic con     Random e     experimer     diagrams,     chains     Methods o     Descriptiv     of sample	oduce and audition of the continuous ore, the students by the statistical er to obtain and er uncertain content the results of regard to correspond to corre	AS systems. alty within the frag is improvement prospectively alternated in the state of the sta	mework of rocess and that enable the appropriate from the suitability is tical invocance.  The manager of the suitability is tical invocance.  The manager of the suitability is tical invocance.  The manager of the suitability is the suitability of the suitability is the suitability of the suitabil	of a QM l QM me les them riately to data mate y of tech estigation ment (QM 0000, VD ction of the and safe relative coability (dependency distributed)	system.  sthods. to: technic erial, pro inical pro ins; and  A 6.1  the QM  ety mans  frequence definition the event	epare decision occesses.  assess them  ts importance  system, document sys	e in the com  umentation,  tems  ability measu onal probab a experiment ion for samp	electroni are, Lapla ility, tree as and Be oles, char- poefficien	ace rnoulli acteristics t, straight
4	Forms of Learning	_	udy, classroom ev	ents in the	e form o	f exercis	ses and pract	icals		
~							pruci			
5	Participat	ion requirement	ts:							

	Formal:	-
	Content:	
6	Forms of assessm	ent:
	Written exam or c	combination exam
7	Prerequisite for th	e award of credit points:
	Module examinat	ion pass and course assessment
8	Application of the	e module (in the following study programmes)
	Electrical Enginee	ering (part-time combined studies) (B.Eng.); Mechanical Engineering (part-time
	combined studies)	(B.Eng.);
9	Importance of the	grade for the final grade:
	Percentage based	on the sum of credits of the graded modules according to RPO- BA §32
10	Module Officer:	
	Prof. DrIng. Pro	f. h.c. Lothar Budde
11	Other information	
	-	

Rapi	id Prototyj	ping / Additive	e Manufacturing						RPAI	7
Ident numl	tification ber:	Workload:	Credits:	Study	semeste	er:	Frequency offer	of the	Duration:	
4071		125 h	5	8th se	em.		Annual (Summer)		1 sem	ester
1	Course:		Planned group s	sizes	Scope	;	Actual co	assroom	Self-stu	ıdy
	Lecture		60 students		2	SCH	0	h	62.5	h
	Tuition i	n seminars	30 students		0	SCH	0	h	0	h
	Exercise		20 students		1	SCH	8	h	38.5	h
	Practical	or seminar	15 students		1	SCH	16	h	0	h
	Supervis- study	ed self	60 students		0	SCH	0	h	0	h
	industria	l applications, to turing and mate	pation, the students aking into account wrial costs, and to co	the proce	ss-specif	fic advar	ntages and d	isadvantag	es as well	as the
3	Contents	,								
3	fused lay Data gen manufact New valu	w of the current yer processes, the deration and pro- turing in proces	additive/generative aree-dimensional pr cess chain, rapid pr is chains, direct ma a additive manufact roduction	rinting, lay rototyping nufacturii	yer lamiı g, rapid t ng	nate proc ooling I	cesses, etc. ntegration of	fadditive	ctive laser	sintering
3	Overview fused lay Data gen manufact New valu The path	w of the current yer processes, the teration and pro- turing in process ue creation with	aree-dimensional process chain, rapid process chains, direct man additive manufact	rinting, lay rototyping nufacturii	yer lamiı g, rapid t ng	nate proc ooling I	cesses, etc. ntegration of	fadditive	ctive laser	sintering
	Overviev fused lay Data gen manufaci New valu The path	w of the current ver processes, the eration and pro- turing in processue creation with to individual pro- f teaching:	aree-dimensional process chain, rapid process chains, direct man additive manufact	rinting, lag rototyping nufacturing ruring/Ecc	yer laming, rapid tong	nate procooling In	cesses, etc. ntegration of ations/Qualit	f additive sy aspects	ctive laser	sintering
	Overviev fused lay Data gen manufact New value The path	w of the current ver processes, the eration and pro- turing in processue creation with to individual pro- f teaching:	aree-dimensional process chain, rapid process chains, direct man additive manufact roduction	rinting, lag rototyping nufacturing ruring/Ecc	yer laming, rapid tong	nate procooling In	cesses, etc. ntegration of ations/Qualit	f additive sy aspects	etive laser	sintering
4	Overview fused lay Data gen manufact New value The path  Forms of Learning  Participa Formal:	w of the current ver processes, the teration and proturing in processue creation with to individual professional processus and the teration requirements of the current of	aree-dimensional process chain, rapid process chains, direct man additive manufact roduction	rinting, lag rototyping nufacturing ruring/Ecc	yer laming, rapid tong	nate procooling In	cesses, etc. ntegration of ations/Qualit	f additive sy aspects	ctive laser	sintering
4 5	Overview fused lay Data gen manufact New value The path  Forms of Learning  Participa Formal: Content:	w of the current ver processes, the reaction and proturing in processue creation with to individual professional processure creation with the individual processure creation requirements of teaching:    The current continues of the current continu	aree-dimensional process chain, rapid process chains, direct man additive manufact roduction	rinting, lag rototyping nufacturing ruring/Ecc	yer laming, rapid tong	nate procooling In	cesses, etc. ntegration of ations/Qualit	f additive sy aspects	ctive laser	sintering
4 5	Overview fused lay Data gen manufact New valuation The path  Forms of Learning  Participation Formal:  Content:  Forms of	w of the current ver processes, the reaction and proturing in processue creation with to individual professional processure from the requirement of the requirement o	aree-dimensional process chain, rapid process chains, direct man additive manufact roduction	cinting, layrototyping nufacturing/Eco	yer laming, rapid to	nate procooling In considerate f exercise	cesses, etc.  Integration of ations/Quality  Ees and pract	f additive sy aspects icals	etive laser	sintering
5 6	Overview fused lay Data gen manufact New value The path Forms of Learning Participa Formal: Content: Forms of Written of Prerequise	w of the current ver processes, the teration and procuring in processue creation with to individual processure tracking:  gunits for self-station requirements  tion requirements  f assessment:  or oral examinatesite for the awaresite for the awaresites.	tree-dimensional process chain, rapid process chains, direct man additive manufact roduction tudy, classroom events:	cinting, lay rototyping nufacturing curing/Ecc ents in the	yer laming, rapid to	nate procooling In considerate f exercise	cesses, etc.  Integration of ations/Quality  Ees and pract	f additive sy aspects icals	ctive laser	sintering
5 6 7	Overview fused lay Data gen manufact New valuation The path  Forms of Learning  Participa Formal: Content: Forms of Written of Module of Applications and a second participals of the content of the cont	w of the current ver processes, the ration and procuring in processue creation with to individual processure tracking:  g units for self-section requirements or oral examination passion of the module of the requirements or or the section of the module of the requirements or oral examination passion of the module of the requirements.	tudy, classroom events:  tion or project worless and course assessand course assessale (in the following	ents in the k, possibly sment g study pr	yer laming, rapid to a go on omic control of the second of	nate procooling Inconsiderate procooling Inconsiderate fever cises be assisted as the considerate fever cises be assisted as the considerate fever cises for the cises fever cises fever cises fever cises for the cises fever c	cesses, etc.  Integration of ations/Quality  Ees and pract	f additive sy aspects icals	etive laser	sintering
4 5	Overview fused lay Data gen manufact New valuation The path  Forms of Learning  Participa Formal: Content: Forms of Written of Prerequision Module of Application Mechani Important	w of the current ver processes, the reation and procuring in processure creation with to individual processure creation with to individual processure creations:  If teaching: It units for self-section requirements in a constant of the aware examination passion of the modulus cal Engineering and of the grade	tree-dimensional process chain, rapid process chains, direct man additive manufact roduction tudy, classroom events:  tion or project worlerd of credit points:	ents in the k, possibly sment g study pr	yer laming, rapid to a series of the series	nate procooling Inconsiderate procooling Inconsiderate considerate fewerciss considerate considerate procession of the considerate fewerciss considerate considerate fewerciss c	cesses, etc.  Integration of ations/Quality  Ees and pract  s partial asse	f additive by aspects icals	etive laser	sintering
4 5 6 7 8	Overview fused lay Data gen manufact New valuation The path  Forms of Learning  Participation Formal: Content: Forms of Written of Written of Module of Application Mechanian Important Percentage  Module of	w of the current ver processes, the ration and procuring in processes are creation with to individual processes are creation with to individual processes are creation requirements.  The control of the aware control of the aware can be control of the moducal Engineering are of the grade ge based on the control of the grade ge based on the control of	tudy, classroom events:  tion or project worler of credit points: ss and course assessible (in the following (part-time combin for the final grade: sum of credits of t	ents in the k, possibly sment g study pr	yer laming, rapid to a series of the series	nate procooling Inconsiderate procooling Inconsiderate considerate fewerciss considerate considerate procession of the considerate fewerciss considerate considerate fewerciss c	cesses, etc.  Integration of ations/Quality  Ees and pract  s partial asse	f additive by aspects icals	etive laser	sintering
5 6 7 8 9	Overview fused lay Data gen manufact New valuation The path Forms of Learning Formal: Content: Forms of Written of Written of Application Mechanical Important Percentage Module of Prof. Dr.	w of the current ver processes, the ration and procuring in processure creation with to individual processure creation with to individual processure creations:  If teaching:  If teachi	tudy, classroom events:  tion or project worler of credit points: ss and course assessible (in the following (part-time combin for the final grade: sum of credits of t	ents in the k, possibly sment g study pr	yer laming, rapid to a series of the series	nate procooling Inconsiderate procooling Inconsiderate considerate fewerciss considerate considerate procession of the considerate fewerciss considerate considerate fewerciss c	cesses, etc.  Integration of ations/Quality  Ees and pract  s partial asse	f additive by aspects icals	ctive laser	sintering

Fluic	d Mechanio	cs and Flow M	<b>f</b> achines						STL	
Ident numb	ification per	Workload:	Credits:	Stud	y semeste	er:	Frequency offer	of the	Durat	ion:
4019	,	125 h	5	6th s	em.		Annual (Summer)		1 semester	
1	Course:		Planned group sizes  60 students		Scope		Actual contact time / classroom teaching		Self-study	
	Lecture				2	SCH	0	h	62.5	h
	Tuition ir	n seminars	30 students			SCH	0	h	0	h
	Exercise Practical or seminar		20 students	20 students		SCH	16	h	46.5	h
			15 students		0	SCH	0	h	0	h
	Supervise	ed self-study	60 students		0	SCH	0	h	0	h
3	Contents: The stude mechanic Physical Hydrosta propagati Basic core Energy ed and dyna flow), ene fluids wit turbine ed operating	entate pressure I tension and selected tension are taught be tall processes that properties of flutics: Definition on, communicancepts of fluid diguation of static mic pressure, freergy equation of the energy supply equation, general to behaviour, influences to the selected tension and tension and tension are tall to the selected tension and tension an	of pressure, hydros ting vessels, pressu	applicate application application ps and to the mps, structured and the mps, structured application and the mps and the mps, structured application and the mps, structured application ap	nanics. The eering processure, directions on planergy equations on the process on planergy equations on the process on planergy equations on planergy equations on the process on planergy equations on the process of t	ney will actice.  rectional e and cuttion of t flow for elines are rork, purns (designation to the control of the control of to the control of the control o	ch consumer on of basic t receive an o independer receive walls, he ideal flui rms of real f and in piping mp, turbine,	s in piping ypes of pur verview of nce of press hydrostatic d (Bernoul luids (lamin elements, i velocity tri	networks.  mps.  the fluid  ure, press buoyancy  li equation nar and tu ncompres angles, Eu	ure  n), static rbulent sible aler's
4 5	Participat Formal: Content:	units for self-st tion requiremen - -	udy, classroom ses ts:	sions in	the form	of exerc	ises			
6	Written e		oral examination							
7	Module e	xamination pas								
8	Applicati	on of the modul	le (in the following (part-time combine		-					
9	Importan	ce of the grade	for the final grade:							

	Percentage based on the sum of credits of the graded modules according to RPO- BA §32
10	Module Officer:
	Prof. DrIng. Jürgen Hermeler
11	Other information:
	-

Dida	actics of To	echnology							TDD	
Iden num	tification ber:	Workload:	Credits:	Study	semeste	er:	Frequency of the offer		Duration:	
4047		125 h	5	8th se	em.		Annual (Summer)		1 semester	
1	Course:		Planned group s	sizes	s Scope		Actual contact time / classroom		Self-study	
	Lecture		60 students		2 SCH		teaching 0 h		62.5	h
		n seminars	30 students		0	SCH	0	h	0	h
	Exercise		20 students		1	SCH	8	h	38.5	h
	Practical	or seminar	15 students		1	SCH	16	h	0	h
	Superviso	ed self-study	60 students		0	SCH	0	h	0	h
2	Learning	outcomes/comp	petences:							
	1				_				Conturns of	
3	• carr	ry out and subse d-oriented manr ect suitable form	e content and the ta ering and electrical quently reflect on her and to transform as of examination a	l engineer a teachin m it didac	ring into g sequen ctically,	didactic	concepts,	-		ing
	Contents Didactic electrical Theories strategies Use of m Educatio (NRW)	chanical engineery out and subset d-oriented manner set suitable forms:  principles of the engineering occ, models, methods in activity-orie odern community and goals and states.	ering and electrical quently reflect on her and to transform as of examination as examination as evocational special cupations) ds and media (e.g.	l enginee: a teachin m it didac and justif disations planning on and lea	ring into g sequentically, y the selection of teach arning technique.	didactic ice, to st ection.	concepts, ructure subject  Id concept in learning pro	n mechanic	t in a learning	ring
3	mee carr fiel sele Contents Didactic electrical Theories strategies Use of m Educatio (NRW) Forms of	chanical engineery out and subset d-oriented manner set suitable forms:  principles of the engineering occurrence, models, methods in activity-orie odern community and goals and staff teaching:	ering and electrical quently reflect on her and to transform as of examination as of examination as evocational special cupations) ds and media (e.g. nted teaching) cation, presentatio	l enginee: a teachin m it didac and justif disations planning on and lea	ring into g sequen stically, y the selection (e.g. learn of teach rning techan gu	didactic ice, to st ection.	ld concept in learning pro	n mechanic cesses, pro	t in a learning	ring
4	carrifiel carrif	chanical engineery out and subset d-oriented manner set suitable forms:  principles of the engineering occurrence, models, methods in activity-orie odern community and goals and staff teaching:	ering and electrical quently reflect on her and to transform as of examination as of examination as evocational special cupations) ds and media (e.g. nted teaching) cation, presentation and ards, framework udy, classroom evoluty, classroom evoluty.	l enginee: a teachin m it didac and justif disations planning on and lea	ring into g sequen stically, y the selection (e.g. learn of teach rning techan gu	didactic ice, to st ection.	ld concept in learning pro	n mechanic cesses, pro	t in a learning	ring
4	carrifiel     seld     Contents     Didactic electrical Theories strategies     Use of m Educatio (NRW)     Forms of Learning     Participa     Formal:     Content:	chanical engineery out and subset d-oriented manner set suitable forms:  principles of the engineering occ, models, methods in activity-orie odern community and goals and state of the engineering occurs in activity orienter of the engineering occurs of the engineering occurs of the engineering occurs of the engineering occurs occ	ering and electrical quently reflect on her and to transform as of examination as of examination as evocational special cupations) ds and media (e.g. nted teaching) cation, presentation and ards, framework udy, classroom evoluty, classroom evoluty.	l enginee: a teachin m it didac and justif disations planning on and lea	ring into g sequen stically, y the selection (e.g. learn of teach rning techan gu	didactic ice, to st ection.	ld concept in learning pro	n mechanic cesses, pro	t in a learning	ring
	mee carr fiel sele Contents Didactic electrical Theories strategies Use of m Educatio (NRW) Forms of Learning Participa Formal: Content: Forms of Performa Prerequis	chanical engineery out and subset d-oriented manner set suitable forms:  principles of the engineering occ, models, methods in activity-orie odern communinal goals and state tion requirements of the engineering occurs of the engineering occurs of the engineering occurs of the engineering occurs	ering and electrical quently reflect on her and to transform as of examination as of examination as evocational special cupations) ds and media (e.g. nted teaching) cation, presentation and ards, framework udy, classroom evoluty, classroom evoluty.	l enginee: a teachin m it didac and justif disations planning on and lea k curricu ents in th	ring into g sequen stically, y the selection (e.g. learn of teach rning techan gu	didactic ice, to st ection.	ld concept in learning pro	n mechanic cesses, pro	t in a learning	ring
5	mee carr fiel sele Contents Didactic electrical Theories strategies Use of m Educatio (NRW) Forms of Learning Participa Formal: Content: Forms of Performa Prerequis Module of Applicatic	chanical engineery out and subset d-oriented manner set suitable forms:  principles of the engineering occurrence, models, methods in activity-orie odern community and goals and state of teaching:  units for self-state of the engineering occurrence in activity orie odern community of teaching:  units for self-state or requirement in a season of the award examination passion of the modulal Engineering (p	ering and electrical quently reflect on her and to transform as of examination as of examination as of examination as evocational special cupations) ds and media (e.g. nted teaching) cation, presentation and ards, framework the company of the com	l enginee: a teachin m it didac and justif disations planning on and lea k curricu ents in th	ring into g sequentically, y the selection of teach runing technique form of the teach runing technique for the teach runing technique	didactice, to steection.  Thing field ing and chnology idelines fexercises.	concepts, ructure subjudice and concept in learning provide of the relevance and practices and practices.	n mechanic ecesses, pro	cal and oblem-solv	ring
4 5 6 7	mee carr fiel sele Contents Didactic electrical Theories strategies Use of m Educatio (NRW) Forms of Learning Participa Formal: Content: Forms of Performa Prerequis Module of Applicati Electrica combined Importan	chanical engineery out and subset d-oriented manner set suitable forms:  principles of the engineering occurrence, models, methods in activity-orie odern communinal goals and state of teaching: units for self-station requirements of the modulation of the grade of the g	ering and electrical quently reflect on her and to transform as of examination as of examination as of examination as evocational special cupations) ds and media (e.g. nted teaching) cation, presentation and ards, framework the company of the com	l enginee: a teachin m it didac and justif disations planning on and lea k curricu ents in th	ring into g sequentically, y the selection of teach range teach and gue form of the form o	didactic ice, to st ection.  rning fie ing and chnology idelines f exercis es) o; Mecha	concepts, ructure subjudice and pract	ant Germa	cal and oblem-solv	ring
4 5 6	mee carr fiel sele Contents Didactic electrical Theories strategies Use of m Educatio (NRW) Forms of Learning Participa Formal: Content: Forms of Performa Prerequis Module of Applicatic combined Importan Percentag	chanical engineery out and subset d-oriented manner out suitable forms:  principles of the engineering occurrence, models, methods in activity-oriented manner of the engineering occurrence of the engineering occurrence of the suitable for self-station requirements of the engineering occurrence test site for the award examination passion of the modulal Engineering (pd studies) (B.Ence of the grade of the g	ering and electrical quently reflect on her and to transform as of examination as of examination as evocational special cupations) ds and media (e.g. nted teaching) cation, presentation andards, framework tes:  d of credit points: s and course assess the (in the following part-time combined g.); for the final grade: sum of credits of the second properties of the second part of the second pa	l enginee: a teachin m it didac and justif disations planning on and lea k curricu ents in th	ring into g sequentically, y the selection of teach range teach and gue form of the form o	didactic ice, to st ection.  rning fie ing and chnology idelines f exercis es) o; Mecha	concepts, ructure subjudice and pract	ant Germa	cal and oblem-solv	ring

Identi numb	ification er:	Workload:	Credits:	Study	semeste	er:	Frequency offer	of the	Durat	ion:
4001		125 h	5	1st se	m.		Annual (Winter)		1 sem	ester
1	Course:		Planned group s	izes	Scope		Actual control / classroot teaching	ontact time om	Self-stu	ıdy
	Lecture		60 students		2	SCH	0	h	62.5	h
	Tuition in seminars		30 students			SCH	0	h	0	h
	Exercise		20 students		1	SCH	8	h	38.5	h
	Practical	or seminar	15 students		1	SCH	16	h	0	h
	Supervise	ed self-study	60 students		0	SCH	0	h	0	h
2	Learning	outcomes/comp	petences:							ı
3	<ul><li>dim</li><li>spec</li><li>crea</li><li>sele</li><li>Contents:</li></ul>	ension the com cify tolerances on the parts lists of act semi-finished	d products.	nat is suit	able for	producti	on.	nes.		
	technical Drawing special fe Special re arrangem Tolerance shaft, gen Surface d Materials Designing	drawing: Form and dimensioni atures in represe presentations a ent, gear illustres and fits: Tole aeral tolerances etails , semi-finished g for production	liant representation ats, title block, scaling suitable for procentation and dimer and dimensioning: The following station, construction construction arance specification (free size tolerance products and heat and materials during the specific station and materials during the size tolerance and materials during the size tole	les, proje duction: I asioning, l'hread ar and illus as, ISO to as), form	ctions ar Elements types of and screw tration o elerance s and posi	nd views s of dime dimensi illustrat f shafts, system, t	, lines, label ensioning, and oning ion, rolling weld illustra fitting system rances	s, sectional trangement bearing illus ation ns: Standard	views of dimen stration as	sions and
4	technical Drawing special fe Special re arrangem Tolerance shaft, gen Surface d Materials Designing Practical list prepar technical selection	drawing: Form and dimensionicatures in represepresentations arent, gear illustres and fits: Tolement tolerances letails, semi-finished g for production course with severation, tolerance drawings and futeraching:	ats, title block, scaling suitable for pro- entation and dimer- entation and dimer- ation, construction erance specification (free size tolerance products and heat	les, proje duction: isioning, Fhread an and illus s, ISO to es), form treatment ing castin cation ex re and co	ctions ar Elements types of and screw tration o elerance s and posi amples ( onsolidat colerance	nd views s of dime dimensi illustrat f shafts, system, i tion tole workpie e the cor e-oriente	, lines, label ensioning, aroning ion, rolling weld illustratiting system rances	s, sectional trangement bearing illus ation ms: Standard g, drawing p or reading a well as semi	views of dimen stration as d bore, sta reparation	sions and  andard  n, parts  ing
	technical Drawing special fe Special re arrangem Tolerance shaft, gen Surface d Materials Designing Practical list prepartechnical selection  Forms of Learning	drawing: Form and dimensionicatures in representations a ent, gear illustres and fits: Tolemeral tolerances etails, semi-finished g for production course with severation, tolerance drawings and further teaching: units for self-st	ats, title block, scaling suitable for pro- entation and dimer- ent dimensioning: Tation, construction erance specification (free size tolerance) products and heat in and materials durieral selected applicate analysis) to acqui for production-orier	les, proje duction: isioning, Fhread an and illus s, ISO to es), form treatment ing castin cation ex re and co	ctions ar Elements types of and screw tration o elerance s and posi amples ( onsolidat colerance	nd views s of dime dimensi illustrat f shafts, system, i tion tole workpie e the cor e-oriente	, lines, label ensioning, aroning ion, rolling weld illustratiting system rances	s, sectional trangement bearing illus ation ms: Standard g, drawing p or reading a well as semi	views of dimen stration as d bore, sta reparation	sions and  andard  n, parts  ing
	technical Drawing special fe Special re arrangem Tolerance shaft, gen Surface d Materials Designing Practical list prepartechnical selection  Forms of Learning	drawing: Form and dimensionicatures in represepresentations arent, gear illustres and fits: Tolement tolerances letails, semi-finished g for production course with severation, tolerance drawings and futeraching:	ats, title block, scaling suitable for pro- entation and dimer- ent dimensioning: Tation, construction erance specification (free size tolerance) products and heat in and materials durieral selected applicate analysis) to acqui for production-orier	les, proje duction: isioning, Fhread an and illus s, ISO to es), form treatment ing castin cation ex re and co	ctions ar Elements types of and screw tration o elerance s and posi amples ( onsolidat colerance	nd views s of dime dimensi illustrat f shafts, system, i tion tole workpie e the cor e-oriente	, lines, label ensioning, aroning ion, rolling weld illustratiting system rances	s, sectional trangement bearing illus ation ms: Standard g, drawing p or reading a well as semi	views of dimen stration as d bore, sta reparation	sions and  andard  n, parts  ing
	technical Drawing special fe Special re arrangem Tolerance shaft, gen Surface d Materials Designing Practical list prepa technical selection  Forms of Learning	drawing: Form and dimensionicatures in representations a ent, gear illustres and fits: Tolemeral tolerances etails, semi-finished g for production course with severation, tolerance drawings and further teaching: units for self-st	ats, title block, scaling suitable for pro- entation and dimer- ent dimensioning: Tation, construction erance specification (free size tolerance) products and heat in and materials durieral selected applicate analysis) to acqui for production-orier	les, proje duction: isioning, Fhread an and illus s, ISO to es), form treatment ing castin cation ex re and co	ctions ar Elements types of and screw tration o elerance s and posi amples ( onsolidat colerance	nd views s of dime dimensi illustrat f shafts, system, i tion tole workpie e the cor e-oriente	, lines, label ensioning, aroning ion, rolling weld illustratiting system rances	s, sectional trangement bearing illus ation ms: Standard g, drawing p or reading a well as semi	views of dimen stration as d bore, sta reparation	sions and  andard  n, parts  ing
5	technical Drawing special fe Special re arrangem Tolerance shaft, gen Surface d Materials Designing Practical list prepartechnical selection  Forms of Learning Participat Formal: Content: Forms of	drawing: Form and dimensionicatures in represe presentations arent, gear illustres and fits: Tole areal tolerances letails areal tolerances with severation, tolerance drawings and fits: teaching:  units for self-station requirements.	ats, title block, scaling suitable for production and dimersioning: The station of the station o	les, proje duction: isioning, Fhread an and illus s, ISO to es), form treatment ing castin cation ex re and co	ctions ar Elements types of and screw tration o elerance s and posi amples ( onsolidat colerance	nd views s of dime dimensi illustrat f shafts, system, i tion tole workpie e the cor e-oriente	, lines, label ensioning, aroning ion, rolling weld illustratiting system rances	s, sectional trangement bearing illus ation ms: Standard g, drawing p or reading a well as semi	views of dimen stration as d bore, sta reparation	sions and  andard  n, parts  ing
4 5 6 7	technical Drawing special fe Special re arrangem Tolerance shaft, gen Surface d Materials Designing Practical list prepartechnical selection  Forms of Learning Participat Formal: Content: Forms of Written e	drawing: Form and dimensionicatures in represe presentations arent, gear illustres and fits: Tole areal tolerances letails areal tolerances with severation, tolerance drawings and fits: teaching:  units for self-station requirements assessment:  xam or combin	ats, title block, scaling suitable for production and dimersioning: The station of the station o	les, proje duction: isioning, Fhread an and illus s, ISO to es), form treatment ing castin cation ex re and co	ctions ar Elements types of and screw tration o elerance s and posi amples ( onsolidat colerance	nd views s of dime dimensi illustrat f shafts, system, i tion tole workpie e the cor e-oriente	, lines, label ensioning, aroning ion, rolling weld illustratiting system rances	s, sectional trangement bearing illus ation ms: Standard g, drawing p or reading a well as semi	views of dimen stration as d bore, sta reparation	sions and  andard  n, parts  ing
6	technical Drawing special fe Special re arrangem Tolerance shaft, gen Surface d Materials Designing Practical list prepartechnical selection  Forms of Learning  Participat Formal: Content: Forms of Written e Prerequis	drawing: Form and dimensionicatures in representations arent, gear illustres and fits: Tolement tolerances details and fits: Tolement tolerances details arent, semi-finished group for production course with severation, tolerance drawings and for teaching: units for self-station requirement assessment: xam or combinite for the awar	ats, title block, scaling suitable for production and dimensioning: The station of the station o	les, proje duction: sisioning, lisioning, liftread an and illus s, ISO to es), form treatment ing castir cation ex re and co atted and the	ctions ar Elements types of and screw tration o elerance s and posi amples ( onsolidat colerance	nd views s of dime dimensi illustrat f shafts, system, i tion tole workpie e the cor e-oriente	, lines, label ensioning, aroning ion, rolling weld illustratiting system rances	s, sectional trangement bearing illus ation ms: Standard g, drawing p or reading a well as semi	views of dimen stration as d bore, sta reparation	sions and andard n, parts ing
6	technical Drawing special fe Special re arrangem Tolerance shaft, gen Surface d Materials Designing Practical list prepar technical selection  Forms of Learning  Participat Formal: Content: Forms of Written e Prerequis Module e Application	drawing: Form and dimensionicatures in represepresentations arent, gear illustres and fits: Tolement tolerances letails and fits: Tolement tolerances letails arent, semi-finished group for production course with severation, tolerance drawings and for teaching: units for self-station requirement assessment: xam or combinite for the aware examination passon of the modulications are respectively.	ats, title block, scaling suitable for production and dimensioning: Interest attention and dimensioning: Interest attention, construction for the size tolerance of the size tol	les, proje duction: lisioning, Fhread an and illus s, ISO to es), form treatment ing castir cation ex re and co atted and the	ctions ar Elements types of and screw tration o elerance s and posi ang amples ( onsolidat colerance	nd views s of dime dimensi illustrat f shafts, system, tion tole workpie e the core c-oriente	, lines, label ensioning, aroning ion, rolling weld illustratiting system rances	s, sectional trangement bearing illus ation ms: Standard g, drawing p or reading a well as semi	views of dimen stration as d bore, sta reparation	sions and  andard  n, parts  ing

	Prof. DrIng. Herbert Funke
11	Other information:
	-

Engi	neering M	echanics I							TME	1
Identi numb	ification er:	Workload:	Credits:	Study	semeste	er:	Frequency offer	of the	Durati	on:
4003		125 h	5	1st se	m.		Annual (Winter)		1 sem	ester
1	Course:		Planned group s	izes	Scope		Actual contact time / classroom teaching		Self-study	
	Lecture		60 students		2	SCH	0	h	62.5	h
	Tuition in	seminars 30 students			0	SCH	0	h	0	h
	Exercise		20 students		2	SCH	16	h	46.5	h
	Practical of	or seminar	15 students		0	SCH	0	h	0	h
	Supervise	d self-study	60 students		0	SCH	0	h	0	h
3	create f carry o calcula analyse	te focal points. e stability proble force systems	es. Investigations anal	ytically o	n manag	eable pl	anar or spati	al technical	example	s.
	mechanic Introducti Fundamer Central pl General p Determini Determini Focus: Bo Friction: S	al structures at on: Delimitation ntals of statics: ane system of flane force syste ing the bearing ing the bearing ody, volume, ar		ply its montions axioms of e-part systemations ravity, sta	ethods.  f statics  stems of for multipability, G	rigid bo -part sys	dies in the p	lane	n and on	
4	Forms of	•								
				sions in	the form	ot exerc	eises			
5	Learning units for self-students		ts:							
<i>3</i>	Formal:	-								
6	Content: Forms of	assessment:	and array in the							
6	Content: Forms of Written ex	xamination or o	oral examination							
	Content: Forms of Written ex	xamination or o	d of credit points:							
6	Content: Forms of Written ex Prerequisi Module ex	xamination or content to the awar warmination pas	d of credit points:	g study pr	ogramm	es)				
6	Content: Forms of Written e: Prerequisi Module e: Application	xamination or of ite for the awar xamination pas on of the modul	d of credit points:		-					
6	Content: Forms of Written e: Prerequis: Module e Application Mechanic Important	xamination or content of the for the award xamination passon of the modulal Engineering the of the grade of t	d of credit points: s le (in the following	ed studie	s) (B.Eng	g.);	ing to RPO-	BA §32		
6 7 8	Content: Forms of Written e: Prerequis: Module e: Applicatic Mechanic Important Percentag	xamination or of ite for the awar xamination pas on of the modulal Engineering be of the grade of the based on the	d of credit points: s le (in the following (part-time combin for the final grade: sum of credits of the	ed studie	s) (B.Eng	g.);	ing to RPO-	BA §32		
6 7 8 9	Content: Forms of Written e: Prerequis: Module e: Applicatic Mechanic Important Percentag	xamination or content for the award xamination passon of the modular al Engineering the of the grade are based on the officer:  Ing. Raimund I	d of credit points: s le (in the following (part-time combin for the final grade: sum of credits of the	ed studie	s) (B.Eng	g.);	ing to RPO-	BA §32		

-0	ineering M	lechanics II							TME	2
Iden num	tification ber:	Workload:	Credits:	Study	semeste	er:	Frequency offer	of the	Durati	ion:
4007	7	125 h	5	2nd s	em.		Annual (Summer)		1 sem	ester
1	Course:	1	Planned group six		zes Scope		Actual contact time / classroom teaching		Self-study	
	Lecture		60 students		2	SCH	0	h	62.5	h
	Tuition in	n seminars	30 students		0	SCH	0	h	0	h
	Exercise		20 students		2	SCH	16	h	46.5	h
	Practical	or seminar	15 students		0	SCH	0	h	0	h
	•	ed self-study outcomes/comp	60 students		0	SCH	0	h	0	h
3	Contents		s and are able to rep					•••		
	Tensile/c Assessme Deformat Vibratory Stress on First and Internal f Bending	ompressive load ent of failure un- tion and therma stress on notch notched compo- second order m forces on the bea- stress I stress	der static loading l stresses n-free components onents ioments of area, mo	ments of		ice				
	Buckling		1							
4	Forms of	teaching:	and equivalent stres audy, classroom sess		the form	of ever	rises			
	Participat	tion requiremen				22 Unoit				
5	Formal: Content:	-								
5	Content: Forms of	assessment:	oral examination							
	Content: Forms of Written e Prerequis	assessment: examination or o	d of credit points:							
6 7	Content: Forms of Written e Prerequis Module e Applicati Mechanic	assessment: examination or content for the awar examination pass on of the modulical Engineering	d of credit points: s le (in the following (part-time combine		-					
6 7 8	Content: Forms of Written e Prerequis Module e Applicati Mechanic Importan	assessment: examination or content for the awar examination passon of the modulical Engineering ce of the grade	d of credit points: s le (in the following	d studie	s) (B.En	g.);	ling to RPO-	BA §32		
6 7	Content: Forms of Written e Prerequis Module e Applicati Mechanic Importan Percentag	assessment: examination or content for the awar examination passon of the module cal Engineering ce of the grade ge based on the	d of credit points: s le (in the following (part-time combine for the final grade: sum of credits of th	d studie	s) (B.En	g.);	ling to RPO-	BA §32		

Eng	ineering M	echanics III							TME	3		
Iden	tification ber:	Workload:	Credits:	Study	semeste	er:	Frequency offer	of the	Durati	ion:		
4010	)	125 h	5	3rd se	em.		Annual (Winter)		1 sem			
1	Course:		Planned group si	group sizes			Actual contact time / classroom teaching 0 h		Self-stu	ıdy		
	Lecture		60 students		2	SCH			62.5 h			
	Tuition in	seminars	30 students		0	SCH	0	h	0	h		
	Exercise		20 students		2	SCH	16	h	46.5	h		
	Practical or seminar		15 students		0	SCH	0	h	0	h		
	Supervised self-study		60 students		0	SCH	0	h	0	h		
3	Contents: Introducti Kinematic Kinetics: theorem, fixed axis	Kinetics of the momentum con ; work, energy,	delimitation of the point, kinema mass point, pure tra servation law for m power in rotational general, planar mo	anslation lass poin l motion:	al motio ts; motio ; momen	on of a b itum, mo	ody in a me	dium; rotati	on of a be	ody about a		
4	Forms of	tooching:										
4		-	udy, classroom sess	sions in t	he form	of exerc	eises					
5	_	ion requiremen										
	Formal: -											
	Content: -											
6	Forms of assessment:											
		Written examination or oral examination										
7			d of credit points:									
		xamination pas										
8	Application of the module (in the following study programmes) Mechanical Engineering (part-time combined studies) (B.Eng.);											
				d studies	s) (B.En	g.);						
9	_	-	for the final grade: sum of credits of the	e graded	module	s accord	ling to RPO-	BA §32				
10	Module C		,.									
		Ing. Raimund I	Kisse									
11	Other information:											

				manicai Enginee			• • • • • • • • • • • • • • • • • • • •		<u>'</u>		
Tech	nical Engl	ish								TENO	3
Identi	ification er:	Workl	oad:	Credits:	Study	semeste	er:	Frequency offer	of the	Durati	ion:
4026		125 h		5	62nd	or 6th se	em.	Annual (Summer)		1 sem	ester
1	Course:			Planned group sizes		Scope		Actual contact time / classroom teaching		Self-stu	ıdy
	Lecture			60 students		2	SCH	0	h	62.5	h
	Tuition in	semina	rs	30 students		0	SCH	0	h	0	h
	Exercise			20 students		2	SCH	16	h	46.5	h
	Practical of	or semin	ar	15 students		0	SCH	0	h	0	h
	Supervised self-study 60			60 students		0	SCH	0	h	0	h
3	and accontex They if Social and pr Method technider the Contents: The st They if	chieved ctually reformulate competer voject woodological texts to target guidents compater the competer compete	a B2.1 lelevant ge issues of ence: The ork. al compet and for group.	nonstrate that they evel. They posses rammar. They conconfidently, clearly by try out and consectence: They use solving contextual tibe relevant enginerminology of the tens; forces and me	nmunica y and in solidate of targeted tasks. T	and basing the spond detail in communate strateg. They can iscipline topic (e	c vocab taneousl n English icative k ies for o n present	ulary of Tery and fluent h both in specey skills in lecontent acquitechnical is	chnical Engly in engine caking and venture	glish and eering job writing sentations critical ay that is	master the situations. , teamwork analysis of appropriate and shapes;
	0.		•	logistics; data pro plinary skills (ema	_			-	hniques; di	scussing (	diagrams).
4	Forms of				3.1	-					- /
-				ly, classroom sess	ions in t	he form	of ever	rises			
5	Participati				10113 111 t	ne romi	or exerc	71505			
5	Formal:		-								
	Content:		_								
6	Forms of	assessm	ent:								
	Combinat										
7				of credit points:							
	Module ex										
8				(in the following	study pr	ogramm	es)				
		Enginee	ering (par	t-time combined s		-		anical Engin	eering (part	-time	
9				r the final grade:							
				m of credits of the	e graded	module	s accord	ling to RPO-	BA §32		
10	Module O		1 77"								
1.1	OStR Cor		_	nıg							
11	Other info	ormation	•								

Ther	modynami	cs							TDY	
Identi numb	ification	Workload:	Credits:	Study	semeste	er:	Frequency offer	of the	Durati	on:
4014		125	5		respecti	ively	Annual (Winter)		1 semester	
1	Course:		Planned group s	Scope		Actual c	ontact time	Self-study		
							classroo	n teaching		
	Lecture		60 students		2	SCH	0	h	62.5	h
	Tuition in	seminars	30 students		0	SCH	0	h	0	h
	Exercise		20 students		1	SCH	8	h	38.5	h
	Practical of	or seminar	15 students		1	SCH	16	h	0	h
	Supervise study	d self	60 students		0	SCH	0	h	0	h
2		outcomes/comp	petences:		<u> </u>					
	Students a	are able to:								
	<ul> <li>appl</li> </ul>	y basic thermo	dynamic concepts s	safely an	d simplit	fy therm	odynamic p	roblems.		
		-	ass and energy bala	nces.						
		ss energy conve		., ,						
			sh between laws fo ate idealised circul			uids.				
			e and function of a	-		stion en	oine: evnlair	the thermo	dynamic	
			n petrol and diesel							oke
	engi		•	,	•					
	• solv	e simple proble	ems of heat transfer	·.						
	questions Thermody boundary, First law of conservati Second la Reversible for revers: Real fluid saturated of Circular p isentropic in the Jou Structure	of rational energy and thermodynamic basics: thermodynamic of the changes of statistics; p/v/T-, log pland superheated processes: super , Carnot and the le process, cour and function of sfer: Heat conditions	material basics for rgy conversion are Open, closed, confic and molecular smics: Heat, work, emamics: Irreversibilate: Application of othermal, isochorice/h-, T/s- and h/s-did steam, steam contectical and subcritermal efficiency, irrse of processes in fan internal combunction, natural and	taught. fined, ho tate varia nthalpy, lity, dissi the therm c, isentro agram fo tent, stea ical proc ternal cop/v, log I stion eng	mogenee ables, pro- internal pation, e- nal equal pic and p r real flu m pressu ess, idea ombustio o/h, T/s a gine; dies	bus, heteocesses, energy, entropy tion of si polytropids, two are, boil: I compa on engine and h/s di sel and p	tate, application changes of the process of the pro	and adiabati ermal equat ific heat cap tion of the fi f state, p/v d boiling line ure ss (Joule, CI d petrol engi	c system ion of sta acity, lav rst and so liagram , dew lin ausius R nes, gas ad 4-strol	s, system tite of of econd law ec, ankine), turbines the engine
4	Forms of	teaching:								
		-	udy, classroom eve	ents in the	e form o	f exercis	ses and pract	icals		
_	Participati	ion requiremen	ts:							
5										
5	Formal:	-								
6	Content:	assessment:								

7	Prerequisite for the award of credit points:
	Module examination pass and course assessment
8	Application of the module (in the following study programmes)
	Electrical Engineering (part-time combined studies) (B.Eng.); Mechanical Engineering (part-time
	combined studies) (B.Eng.);
9	Importance of the grade for the final grade:
	Percentage based on the sum of credits of the graded modules according to RPO- BA §32
10	Module Officer:
	Prof. DrIng. Jürgen Hermeler
11	Other information:
	-

			Mecha	nical Engineer	ing (pa	art-time	combii	ned studies	)		
Elect	tive Projec	et								WP	
Ident	ification	Worklo	ad:	Credits:	Study	semeste	er:	Frequency	of the	Durati	ion:
4044		125 h		5		6th sem	1.	each seme	ster	1 sem	ester
1	Course:	Course: Planne			anned group sizes Scope			Actual contact time / classroom		Self-study	
	Lecture		60	) students		2 SCH		teaching 0 h		62.5	h
	Tuition in seminars			30 students		0	SCH	0	h	0	h
	Exercise		20	) students		2	SCH	16	h	46.5	h
	Practical	or semina		students		0	SCH	0	h	0	h
	Supervise	ed self-stu	tudy 60 students			0	SCH	0	h	0	h
3	group. The They can meaningf They are research of They can examinat They can appropriate Contents:  Basics of Project place Timing Cooperat Independ Documer Presentate	ney can de break dov ful way at able to inc question. select suitions, etc. justify the tely to an arrange ion and dient process tation technicions to break arrange ion technicion in the process tation technicion in the process tat	fine the coving a compute end. I dependent table technic esteps of taudience.  anagement vision of taudience table technic esteps of taudience.	a task from the content and bound lex question into lex question into ly research, evaluated methods to their actions in a t	daries o o subtas uate and carry o n meanin	f the prosks for p d select out neces	ject. rocessin informat sary exp ay and do	g and combition on the toperiments, see	ine the subtation opic and materies of mea	asks againake it usal surement eir results	n in a ble for the s,
4		units for s		classroom sessi	ons in t	he form	of exerc	cises			
5	Participat Formal: Content:	tion requir	ements: -								
6	Forms of	assessmer ork, prese									
7	Prerequis		award of	credit points:							
8	Applicati Electrical	on of the i Engineer	nodule (ir ing (part-t	the following s ime combined s		_		nnical Engin	eering (part	-time	
9	Importan Percentag	ge based o	rade for th	ne final grade: of credits of the	graded	module	s accord	ling to RPO-	- BA §32		
10	Module ( Prof. Dr	Officer: Ing. Mich	ael Fahri								
11		ormation:									
	-										

	tics Engine	eering							WKK	(		
Ident numb	ification per:	Workload:	orkload: Credits: Stud		ıdy semester:		Frequency of the offer		Durati	ion:		
4030		125 h	5	5 4th se			Annual (Summer)		1 semester			
1	Course:	1	Planned group sizes		Scope		Actual contact time / classroom teaching		Self-study			
	Lecture		60 students		2	SCH	0	h	62.5	h		
	Tuition in	n seminars	30 students		0	SCH	0	h	0	h		
	Exercise		20 students		1	SCH	8	h	38.5	h		
	Practical	or seminar	15 students		1	SCH	16	h	0	h		
	Superviso	ed self-study	60 students		0	SCH	0	h	0	h		
3	plastics and to select the different materials in an engineering-oriented manner, taking into account manufacturing and operating conditions.  Contents:  Plastics in practice: What is plastic? Production and history, processing The structure of matter: Periodic table of the elements, the chemical bond, from monomer to macromolecule Polymeric materials: Thermoplastics, duromers, conventional elastomers (rubber), thermoplastic elastomers, nomenclature and abbreviations for polymers, overview of the selected material classes, economic and technological considerations Molecular weight distribution: Molar mass distributions and mean values of molar mass											
			ons			ne select	ed material o	classes, eco				
	Molecula The syntl Phase tra Rheology Importan	ar weight distributes of polymer nsitions: Glass to y of plastics: Struce of additives:	ons	distributiner build- nity, amonon-Newt t stabilise	ions and up reacti orphous a conian flo ers, antis	mean va ons, and semi ow, ener	ed material of alues of mola -crystalline gy and entro	classes, eco ar mass plastics	nomic and			
4	Molecular The synti Phase tra Rheology Importan Influence	ar weight distributed in weight distributed in weight distributed in sitions: Glass to of plastics: Struce of additives: to of the manufactive of the manufactive in the weight distributed in weight	ons ution: Molar mass rs: Types of polym ransition, crystalli uctural viscosity, r Antioxidants, ligh	distributiner build- nity, amonon-Newt t stabilise on the ma	ions and up reacti rphous a conian fle ers, antisu tterial pro	mean va ons, and semi ow, ener tatic age operties	ed material of alues of mola- crystalline gy and entro	classes, eco ar mass plastics ppy elasticit	nomic and			
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5 6 7	Forms of Learning Participa Formal: Content: Forms of Written of Prerequise Module of Application	treaching: units for self-strion requirement	ons ution: Molar mass rs: Types of polym ransition, crystalli uctural viscosity, r Antioxidants, ligh turing conditions of  udy, classroom even ts:  ion or term paper, d of credit points: s and course assess le (in the following	distributioner build- nity, amonon-Newtot stabilise on the ma	ions and up reacti prophous a conian fle ers, antisu terial pro- e form o  also in p	mean va ons, and semi ow, ener tatic age operties	ed material of alues of molarcrystalline gy and entronts, etc.	classes, eco ar mass plastics ppy elasticit	nomic and			
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5	Forms of Learning Participal Formal: Content: Forms of Written of Prerequising Mechanical Important Percentage Module of Modul	tr weight distributed in the sist of polymer institions: Glass to polymer institions: Glass to polymer institions: Struce of additives: to of the manufact of the manufact in the sist of the award in the sist of the award in the sist of the grade for the	ons ution: Molar mass rs: Types of polym ransition, crystalli uctural viscosity, r Antioxidants, ligh turing conditions of  udy, classroom even ts:  ion or term paper, d of credit points: s and course assess le (in the following (part-time combin for the final grade: sum of credits of the	distributioner build- nity, amonon-Newlet stabilise on the management of the studies of the stabilise on the management of the studies of the	ions and up reacti prophous a conian fle ers, antisu terial pro e form o  also in p	mean va ons, and seminow, ener tatic age operties  f exercis  artial pe  mes) g.);	ed material of alues of molar crystalline gy and entrounts, etc.	classes, eco ar mass plastics ppy elasticit  icals  possible	nomic and			
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	al Engineer	ring							WKI	
Ident numb	ification per:	Workload:	Credits:	Study semester:			Frequency offer	of the	Duration:	
4016		125 h	5	4th sem.			Annual (Summer)		1 semester	
1	Course:	1	Planned group s	izes	Scope		Actual control / classroom teaching		Self-stu	ıdy
	Lecture		60 students		2	SCH	0	h	62.5	h
	Tuition in seminars		30 students	30 students		SCH	0	h	0	h
	Exercise		20 students		1	SCH	8	h	38.5	h
	Practical	or seminar	15 students		1	SCH	16	h	0	h
	Supervise	ed self-study	60 students	60 students		SCH	0	h	0	h
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3	Lattice de	of metallic matefects and their	effect on material	behaviou	r deform	ation an	d fracture:			
	Alloying: and auste Influence Hardenin Steel desi Properties tool steels	nitisation of selected allog & Tempering gnations s and material b s, cast iron.	and iron-carbon d	ed steel n	naterials	such as	structural ste	eels, case-ha	rdened si	teels and
4	Alloying: and auste Influence Hardenin Steel desi Properties tool steels Selected a	State diagrams nitisation of selected allo g & Tempering gnations s and material b s, cast iron. areas of materia teaching:	s and iron-carbon do bying elements behaviour of selecte	ed steel n	naterials perties w	such as :	structural sto	eels, case-ha racticals.	rdened si	teels and
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5	Alloying: and auste Influence Hardenin, Steel desi Propertie: tool steels Selected a Forms of Learning Participat Formal: Content: Forms of Written o Prerequis Module e	State diagrams nitisation of selected allo g & Tempering gnations s and material b s, cast iron. areas of materia teaching: units for self-st ion requiremen	s and iron-carbon dopying elements  behaviour of selected als testing and mate and udy, classroom events:  ion or term paper d of credit points:	ed steel nerials properties in the	perties w	such as sill be en	structural sto	eels, case-ha racticals.	rdened st	teels and
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<ul><li>5</li><li>6</li><li>7</li></ul>	Alloying: and auste Influence Hardening Steel desi Properties tool steels Selected a Forms of Learning Participate Formal: Content: Forms of Written o Prerequis Module e Application Mechanic Important	State diagrams nitisation of selected allog g & Tempering gnations s and material b s, cast iron. areas of materia teaching: units for self-st ion requiremen  assessment: r oral examinat ite for the awar xamination pas on of the modu cal Engineering ce of the grade	s and iron-carbon dopying elements  behaviour of selected selections and materials testing and testing a	ed steel nerials projects in the	perties we form of	such as still be en	structural standard in page 2 and pract	eels, case-ha racticals. icals	rdened s	teels and