

Module Handbook

Master's Degree in Civil Engineering

Valid since winter semester 2019/20

Hochschule für angewandte Wissenschaft und Kunst Hildesheim/Holzminden/Göttingen University of Applied Sciences and Arts

www.hawk.de/b

The module handbook lists the modules of the 3-semester Master's program in Civil Engineering at HAWK in Hildesheim. The program is designed as a consecutive Master's program after a 7semester Bachelor's program in civil engineering, which is evaluated with 210 credit points. Graduates of the wood engineering program (with a specialization in structural timber engineering) are also eligible for this Master's program. As a result, an additional 90 credit points must be earned in the Master's program.

The modules are all advanced modules (elective modules), which are to be carefully combined by the students on their own responsibility. Profiling by choosing a specialization is possible, but not mandatory. The areas of specialization/majors are:

- Structural civil engineering and
- Water and traffic engineering

In order for a specialization to be designated in the final documents, at least 6 associated modules (corresponding to 36 CP) from the catalog according to the examination regulations (BT) as well as the final thesis (30 CP) must be assigned to this specialization. An additional 24 CP must be completed from the other modules offered (including those from the non-selected specialization). The corresponding assignment information can be found in the module descriptions; module descriptions are also included that are not assigned to any specialization and are therefore suitable as supplements for both profiles. It is also possible to not to choose any specific major; then the specialization modules from the offer of the Master's program for Civil Engineering can be combined as desired. If a major is chosen, the combination may be as follows:

8th semester	9th semester	10th semester
Module 1 (chosen major)	Module 4 (chosen major)	
Module 2 (chosen major)	Module 5 (chosen major)	Master's thesis
Module 3 (chosen major)	Module 6 (chosen major)	(from the chosen
Freely selected module	Freely selected module	major)
Freely selected module	Freely selected module	

Module descriptions may be revised as required and as decided by the relevant study commission, taking full account of accreditation conditions; in particular, the range of noncompulsory specialization modules (majors) may vary depending on the actual teaching capacity available.

The modules are offered either in the winter <u>or</u> summer semester; this does not apply to the module "Master's thesis", which can be chosen in any semester. Details can be found in the respective module description. Since it is possible to begin studies in both the summer and winter semesters, this must be taken into account in good time when planning your own individual studies. It cannot be guaranteed that all the specialization modules listed will take place in the specified semester in each case; this applies in particular to modules in which the use of teaching assistants is planned.

A basic offer with the required minimum number of specialization modules (there are 3) for the major selected is only ensured in the winter semester; students are not entitled to have any specific specialization modules take place. Specialization modules with fewer than 5 participants cannot be held. These constraints, necessary for the maintenance of an orderly lecture schedule, must be taken into account by the students in the individual planning of their course of study.

The following applies to the counting method: subject modules are assigned to the 8th (summer) and 9th (winter) semesters of the regular study program, and the final thesis is written in the 10th semester.

It is strongly recommended that students choose the modules as well as the final thesis with great care and that they combine their courses in the best possible way. Students are strongly advised to seek academic advising. Academic advising is also recommended with regard to later professional practice and a possible further qualification.

The Master's degree awarded upon completion of the program is the second professional qualifying degree at Level 2 of the Qualifications Framework for German Higher Education Qualifications. The degree earned with a good overall mark qualifies the student to enter studies at Level 3 (doctoral programs). The Master's degree with a preceding Bachelor's degree in civil engineering with a total of 10 standard semesters is an essential prerequisite to be able to enter the preparatory service for the career of the higher technical administrative service of the civil engineering disciplines designated there (e.g. railroad engineering, road engineering, water engineering, environmental engineering) in accordance with the relevant legal regulations of the federal states. The regulations of the Higher Technical Administrative Service Examination Office must be observed.

Module overview:

Module no.	Module name	Credit points	WS/SS	Work load	Course attendan ce time	Home study	Type of examinat ion
Majors mo	odules in general						
MBV 61	Building climatology (currently not offered)	6	SS	180	60	120	PA
MBV 62	Building energy design (currently not offered)	6	SS	180	60	120	PA
MBV 63	Building services energy design (currently not offered)	6	SS	180	60	120	PA
MBV 65	Measurement technology in building physics (currently not offered)	6	WS	180	60	120	PA
MBV 77	Concrete technology I	6	WS	180	90	90	K2 + PA
MBV 78	Concrete technology II	6	SS	180	90	90	K2 + R
MBV 89	Tunnel, shaft and gallery construction	6	SS	180	60	120	ST
MBV 90	Digital planning and building	6	SS	180	60	120	PA
MBV 91	Land surveying	6	WS	180	60	120	ST
MBV 92	Construction Management, AVA	6	SS	180	60	120	K2
MBV 93	Research in civil engineering	6	WS	180	60	120	ST
MBV 94	Geotechnics 3, Process engineering	6	SS	180	60	120	ST
MBV 96	R&D in civil and wood engineering	6	SS	180	60	120	ST
MBV 97	Management techniques	6	WS	180	60	120	R
MBV 98	Special project	6	WS + SS	180	60	120	PA
MBV 99	Master's thesis	30	WS + SS	750	8	742	AA
Major: <i>Sti</i>	uctural engineering						
MBV 01	Project Solid construction	6	WS	180	60	120	PA
MBV 02	Steel engineering	6	WS	180	60	120	ST
MBV 03	Special fields of solid construction	6	WS	180	60	120	K2
MBV 04	Prestressed concrete bridge construction	6	SS	180	60	120	ST
MBV 07	Surface support structures	6	WS	180	60	120	ST
MBV o8	Prestressed concrete construction 2	6	SS	180	60	120	K2
MBV 10	Technical mechanics, Static 4, Structural engineering 4	6	SS	180	60	120	K2
MBV 13	Composite construction	6	SS	180	60	120	K2
Major: Wa	ter and traffic engineering*						
MBV 31	Project for major in Water engineering	6	WS	180	60	120	PA
MBV 32	Process engineering in urban water management	6	SS	180	60	120	ST
MBV 33	Multifunctional hydraulic engineering facilities	6	SS	180	60	120	R
MBV 34	Sustainable water resources management	6	WS	180	60	120	М
MBV 35	Water quality management	6	SS	180	60	120	ST
MBV 36	Plant engineering in urban water management	6	WS	180	60	120	М
MBV 37	Mobility management (currently not offered)	6	SS	180	60	120	ST
MBV 38	Mobility impact (currently not offered)	6	WS	180	60	120	ST
MBV 39	Local public transportation (currently not offered)	6	WS	180	60	120	K2

MBV 40	Road traffic engineering	6	SS	180	60	120	ST
MBV 41	Urban streetscape planning	6	WS	180	60	120	ST
MBV 42	Municipal traffic concepts	6	SS	180	60	120	ST
MBV 43	Design and maintenance of railroad facilities	6	SS	180	60	120	ST
MBV 44	Railway engineering	6	WS	180	60	120	ST

* For the recognition of one of the two specializations (structural engineering or water and transport engineering), at least six modules belonging to the respective major must be selected; in addition, the Master's thesis must be completed in this specialization. Otherwise, "General" will be designated as the major.

Note: The list of specialization modules in the elective (compulsory) area is not exhaustive; further modules can be added according to demand. Modules are only offered according to current teaching capacity; in this respect, there is no entitlement to the implementation of all or any specific specialization modules. Modules with fewer than five participants will not be carried out.

Abbreviation	Name
AA	Final thesis with colloquium
К2	2-hour written exam
Μ	Oral examination
ST	Student research paper according to module description
РА	Project work according to module description
R	Seminar paper

Allocation to course	e of study	Module name	Module name		Internal	Last updated		
Master's Degre Engineering	ee in Civil	Project Solid construction		MBV 01		01.09.2018		
Study semester	Offered in			Credit points	1	Semester week hours		
9th semester	WS			6 CP		4 SWS		
Allocation to study	specialization	Responsible for modu	lle	Type of teaching,	group size,	if applicable		
Structural civil e	ngineering	Prof. DrIng. Ma	rtin Klaus	Project work with supervision in groups				
Can also be credite	d to study program			Language of instru	uction			
-				German				
Requirements acco	rding to examination reg	ulations	Recommended prerec	Recommended prerequisites				
			Bachelor's degree with a major in structural engineering					
Study/examination	achievements/ examina	tion types	If applicable, weighting of the study/examination achievements					
Project work w	ith colloquium							
-								

Module objectives/desired learning outcomes:

Independent processing of a practical project until it is ready for execution.

objectively justify their opinions to others in professional discussions.

Students are able to work independently on a project in the field of structural engineering, also across construction types, until it is ready for execution. They are able to deal with the tasks of structural design on a concrete object from an engineering point of view and to work on this in sub-areas until it is ready for execution. They have further developed their learning strategies and have practiced expanding their knowledge independently using current literature. They have learned to improve their teamwork skills within a team and to present and

Contents:

Working on a concrete project from practice in the field of structural or civil engineering, students are to work out selected planning phases according to HOAI independently in sub-areas. They are to develop new areas of knowledge independently using literature. They make reference to the various aspects that must be taken into account in the realization of construction projects. This concerns selected structural and design aspects and aspects of economic efficiency combined with scheduling issues. To do so, planning meetings are held on a weekly basis, at which the planning statuses and facts that have been worked out must be presented and justified in groups.

Course attendance time (in mandatory hours - LVS)		Workload (in hours)						
Prof. Dr. M. Klaus	4 LVS	Course atten	dance time	Home study				
	-	Lecture		Course accompanying				
	-	Exercise		and exam preparation	120 h			
	-	Other	60 h					
Total classroom time	4 LVS	Total worklo	ad		180 h			
Optional extra		·						
Literature								
is listed in Stud.IP								

Allocation to course	of study	Module name		Course o	code	Internal	Last updat	ed
Master's Degre Engineering	e in Civil	Steel engineering		MB	V 02		01.09.20	18
Study semester 9th semester	Offered in WS	-		Credit po 6 CP	oints	<u> </u>	Semester v 4 SWS	veek hours
Allocation to study s		Responsible for modul	e		teaching,	group size,	if applicable	
Structural civil er		Prof. DrIng. Stef	anie Steppeler	Lecture with integrated exercise			d exercise	S
Can also be credited	I to study program			Language of instruction German				
- Requirements accor	ding to examination regu	lations	Recommended prer		dfi			
Requirements accor		liations	Bachelor's degi		major ir	n structur	al engine	ering
Study/examination	achievements/ examinati	on types	If applicable, weight		-		_	0
Student resear	ch paper with colloq	uium						
-								
Module objectiv	es/desired learning	outcomes:						
 are able to ind learn about so can implement acquire basic 	It construction princi dependently develop pecial connection tec nt the principles of st knowledge of corros fatigue-endangerec	o possible solutions chniques of load-be tructural design usir sion protection and	for design details aring structures, ng CAD programs, material selectior	s, , n in steel c	onstruc			
glass construc • Dimensioning • Corrosion pro • Fatigue and fa • Structural glas	and design of select tection systems and atigue-appropriate d	ed connections for corrosion protectio esign	structural engine					
Course attende	nce time (in mandat	ony hours 11/5)	Modeland					
		2 LVS	Workload (in ho		Homo	tudy		
Prof. Dr. S. Step L. B.	pheiei	2 LVS 2 LVS	Course attendar	60 h	Home s	accompa	nving	1
L. D.			Exercise	0011		accompa am prepa		120 h
			ł – – – – – – – – – – – – – – – – – – –			an hiche		
Total classroom	time		Other Total workload					190 6
Optional extra	ume	4 LVS	TOTAL WOLKIOAD					180 h
Software traini	ng in CAD							
is listed in Stud	d.IP							

Master's Degree in Civil Engineering			Course	code	Internal	Last updated			
	Special fie	lds of solid	MB	V 03		31.05.2	021		
Study semesterOffered in9th semesterWS	-	ruction	Credit p 6 CP	oints		Semester 4 SWS	week hours		
	Responsible for modu Prof. DrIng. Mic		Language of instruction						
-		1		German					
Requirements according to examination regulation	ions	Recommended pr		maiori	o structu	al ongino	oring		
Study/examination achievements/ examination	types	Bachelor's degree with a major in structural engineering If applicable, weighting of the study/examination achievements							
Written examination (K2) - Module objectives/desired learning ou		BB 3-7 (Solid construction 1), BB 4-6 (Solid construction: 2), BE 33 Solid construction 3							
construction in depth and can apply the second s	nese skills to imp	ermeable structi	ures, amon	g otners					
Contents:									
 Design and dimensioning of bracing s Disc-type components (part 2) Bar models and design of discontinui Moment-curvature relationships in r Nonlinear calculation (geometric/phr Varification of conviceability limit state) 	ity areas (part 2) einforced concre ysical) of reinforc te design (crack v	te structures ed concrete com	npression m						
 Verification of serviceability limit sta Special features of waterproof concr 									
	y hours - LVS)	Workload (in h	nours)						
- Special features of waterproof concr	y hours - LVS) 4 LVS	Workload (in F Course attenda	1	Home	study				
- Special features of waterproof concr Course attendance time (in mandator			1	Course	accompa				
- Special features of waterproof concr Course attendance time (in mandator		Course attenda	ance time	Course			120 h		
- Special features of waterproof concr Course attendance time (in mandator		Course attenda Lecture	ance time 30 h 30 h	Course	accompa		120 h 180 h		
- Special features of waterproof concr Course attendance time (in mandator		Course attenda	ance time			ne study Irse accompa	me study Irse accompanying		

Allocation to cours	e of study	Module name		Course code	Internal	Last updated		
Master's Degr	ee in Civil	Prestress	ed concrete	MBV 04		01.03.2021		
Engineering Study semester	Offered in		onstruction	Credit points		Semester week hours		
8th semester	SS			6 CP 4 SWS		4 SWS		
Allocation to study Structural civil e		Responsible for mod Prof. DrIng. M		Klaus Type of teaching, group size				
Can also be credite	d to study program			Language of instruction German				
- Requirements acco	ording to examination re	gulations	Recommended prere	equisites				
				crete constructio		· · · · · · · · · · ·		
	achievements/ examination of the second se		If applicable, weight	ng of the study/exam	ination ach	levements		
-		Jquium						
Module objecti	ves/desired learnir	ng outcomes:						
viouule objecti	ves/desired learnin	ig outcomes.						
Design and cal	culation of reinforc	ed concrete and pre	stressed concrete h	ridges for road t	raffic			
	ro tomulior with diff	toront load_hoaring	customs and boaring	o types of solid bi	ridges and	d their reasonable		
The students a			systems and bearing					
		-	-		-			
cross-section o	lesign. They are fan	niliar with the load a	assumptions of road	bridges and kno	w the reg	ulations in road		
cross-section of bridge constru	lesign. They are fan ction. They are able	niliar with the load a e to design simple so	assumptions of road olid bridges (with an	bridges and kno d without prestr	w the reg essing; sig	ulations in road gnificantly with plat		
cross-section of bridge construe or plate-beam	lesign. They are fan ction. They are able cross-section) and	niliar with the load a e to design simple so calculate them using	assumptions of road olid bridges (with an	bridges and kno d without prestr	w the reg essing; sig	ulations in road gnificantly with plat		
cross-section of bridge construe or plate-beam	lesign. They are fan ction. They are able	niliar with the load a e to design simple so calculate them using	assumptions of road olid bridges (with an	bridges and kno d without prestr	w the reg essing; sig	ulations in road gnificantly with plat		
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cross-section of bridge construe or plate-beam	lesign. They are fan ction. They are able cross-section) and	niliar with the load a e to design simple so calculate them using	assumptions of road olid bridges (with an	bridges and kno d without prestr	w the reg essing; sig	ulations in road gnificantly with plat		
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cross-section of bridge constru or plate-beam structural anal contents: • Overview of • Regulations i • Design of sin • Bearing conc • Impacts on r • Load transfe	design. They are fan ction. They are able cross-section) and ysis of simple bridg different bridge sys n road bridge const aple solid bridges in epts for solid bridges	niliar with the load a e to design simple so calculate them using the superstructures. stems (overlapping t truction a longitudinal and tra- es es and estimation of	ypes)	bridges and kno d without prestr	w the reg essing; sig	ulations in road gnificantly with plat		
cross-section of bridge constru or plate-beam structural anal contents: • Overview of • Regulations i • Design of sin • Bearing conc • Impacts on r • Load transfe • Model buildi	lesign. They are fan ction. They are able cross-section) and ysis of simple bridg different bridge sys n road bridge const aple solid bridges in epts for solid bridges r in bridge structure ng in bridge constru	niliar with the load a e to design simple so calculate them using the superstructures. stems (overlapping t truction a longitudinal and tra- es es and estimation of	ypes) ansverse direction	bridges and kno id without prestr are. They are able	w the reg essing; sig	ulations in road gnificantly with plat		
cross-section of bridge constru or plate-beam structural anal structural anal Contents: • Overview of • Regulations i • Design of sin • Bearing conc • Impacts on r • Load transfe • Model buildi • Internal force	lesign. They are fan ction. They are able cross-section) and ysis of simple bridg different bridge sys n road bridge const aple solid bridges in epts for solid bridges r in bridge structure ng in bridge constru	niliar with the load a e to design simple so calculate them using the superstructures. Stems (overlapping t truction a longitudinal and tra- es es and estimation of uction	ypes) ansverse direction	bridges and kno id without prestr are. They are able	w the reg essing; sig	ulations in road gnificantly with plat		
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Course attendance time (in mandatory hours - LVS)		Workload (in hours)						
Prof. Dr. M. Klaus	4 LVS	Course attendance time		Home study				
	-	Lecture	45 h	Course accompanying				
	-	Exercise	15 h	and exam preparation	120 h			
	-	Other						
Total classroom time	4 LVS	Total workloa	d		180 h			
Optional extra		•			·			
Literature								

Allocation to course	e of study	Module name		Course coo	de I	Internal	Last updat	ed
Master's Degre	ee in Civil	Surface suppo	ort structure	s MBV	07		01.03.20	021
Engineering Study semester 9th semester	Offered in WS	_		Credit poir 6 CP	nts		Semester v 4 SWS	week hours
Allocation to study	specialization	Responsible for modul	е	Type of tea	aching, gr	oup size,	if applicable	
Structural civil e		Prof. DrIng. Mar	tin Klaus	Lecture and exercise				
Can also be credite	d to study program		Language of instruction German					
- Requirements acco	rding to examination re	gulations	Recommended prere		1			
		8	Bachelor's degre		najor in s	structur	al engine	ering
Study/examination	achievements/ examination	ation types	If applicable, weighti	ng of the stud	ly/examina	ation ach	ievements	
Student resear	ch paper with collo	oquium						
-								
Module objectiv	ves/desired learnir	ng outcomes:						
are familiar wi	th the types of four w foundations. The	uctural shells in buildir ndations generally use ey are able to perform	d in building cons	truction and	d can al	so desig	gn and cal	culate
 Repetition ar use of data pr prefabricated More detaile 	ocessing (line-bear parts) d verification of sla	f the calculation of are ing slabs; flat slabs; fla b deformations (state	at foundations; us	e of semi-		ie		
	dded surface found f surface supportin	g structures using the	finite element me	ethod with o	commei	rcial sof	ftware use	ed in actual
 Preparation of 	of reinforcement dr	rawings for surface su	pporting structure	S				
Course attenda	ince time (in mand	atory hours - LVS)	Workload (in ho	urs)				
Prof. Dr. M. Kla	aus	4 LVS	Course attendan	ce time H	lome stu	udy		
		-	Lecture 4		Course a	-		
		-	Exercise 1	.5 h a	ind exan	n prepa	ration	120 h
		-	Other					
Total classroon	n time	4 LVS	Total workload					180 h
Optional extra								
Literature is listed in Stu	d.IP							

Allocation to course of study	Module name		Course	code	Internal	Last updated			
Master's Degree in Civil	Prestresse	d concrete	ME	8V 08		01.03.2021			
Engineering Study semester Offered in	constru		Credit	ooints		Semester week hours			
8th semester SS	constru		6 CP			4 SWS			
Allocation to study specialization Structural civil engineering	Responsible for module Prof. DrIng. Mar			f teaching, I re and e		if applicable			
Can also be credited to study program				Language of instruction					
-		Description	Germ	nan					
Requirements according to examination regu	llations	Recommended pr Bachelor's de		maior i	n structu	al engineering			
Study/examination achievements/ examinati	ion types		-	ree with a major in structural engineering ting of the study/examination achievements					
Written examination (K2)									
-									
Module objectives/desired learning	outcomes:								
Design and calculation of any prest	ressed structures in a	solid constructi	on						
Students are familiar with the differ	rent types of prestre	essing in concret	te construc	tion and	are fami	liar with the			
terminology used in prestressed co									
determinate and indeterminate pre-		-	-			-			
concrete construction compared to		-		-					
subsequently supplemented cross s	sections.								
Contents:									
Historical development, prestress	ing process, tendon	components							
Internal force determination of st	atically determinate	and indetermin	nate systen	ns					
 Time and location-dependent clar 									
Structural design of prestressed c	-								
Design of tendon layout and preli	-	-							
 Verification of prestressed concre Special features and calculation o 									
 Software application for the calcu 				ing com	mercial so	oftware			
			ponento do		incretar st	, it wante			
A 11 1 1 1									
Course attendance time (in mandat		Workload (in l							
Prof. Dr. M. Klaus	4 LVS	Course attend		Home		anving			
	-	Lecture	45 h 15 h		accompa am prepa				
	-	Exercise Other	11.01		an prepe				
Total classroom time	4 LVS	Total workloa	d	I		180 h			
Optional extra	7 2 4 5		-			100 11			
Literature									
is listed in Stud.IP									

Allocation to course of st	udy	Module name		Course	code	Internal	Last upda	ted
Master's Degree in	Civil	Technical n	nechanics 4	ME	BV 10		31.05.2	021
Engineering Study semester Off	fered in		structural	Credit	ooints		Somostor	week hour
8th semester SS		-		6 CP	5011125		4 SWS	Week nour
Allocation to study speci	alization	Responsible for modu	eering 4	Type o	fteaching	group size	if applicable	9
All		Prof. DrIng. Mic					d exercise	
Can also be credited to s					ge of instru	uction		
Bachelor of Civil En			Description	Germ	nan			
Requirements according	to examination regul	lations	Recommended pr BB 1-4, BB 2-4	•				
Study/examination achie	evements/ examination	on types	If applicable, weig		tudy/exam	ination ach	nievements	
Written examinatio								
-								
/odule objectives/	desired learning	outcomes:						
engineering. In this	cuse, nowever, e		ven in a consecu		r s progra	aiii.		
Contents:			ven in a consecu					
Contents: - Kinematics							meusing	the
Contents: - Kinematics - Determination of	the support react	tions and internal f	forces of statical	ly indeterm	ninate pla	ane syste	ms using	the
Contents: - Kinematics - Determination of	the support react		forces of statical	ly indeterm	ninate pla	ane syste	ms using	the
Contents: - Kinematics - Determination of deformation varia - Introduction to no	the support react ble method (ang polinear beam sta	tions and internal f le of rotation meth	forces of statical	ly indeterm	ninate pla	ane syste	ms using	the
Contents: - Kinematics - Determination of deformation varia - Introduction to no - Load-bearing proc	the support react ble method (ang pollinear beam sta	tions and internal f le of rotation meth atics	forces of statical nod) according to	ly indeterm b I. and II. t	ninate pla	ane syste	ms using	the
Contents: - Kinematics - Determination of deformation varia - Introduction to no - Load-bearing proc	the support react ble method (ang pollinear beam sta	tions and internal f le of rotation meth atics	forces of statical nod) according to	ly indeterm b I. and II. t	ninate pla	ane syste	ms using	the
Contents: - Kinematics - Determination of deformation varia - Introduction to no - Load-bearing proc	the support react ble method (ang pollinear beam sta	tions and internal f le of rotation meth atics	forces of statical nod) according to	ly indeterm b I. and II. t	ninate pla	ane syste	ms using	the
Contents: - Kinematics - Determination of deformation varia - Introduction to no - Load-bearing proc - Calculation of sup	the support react ble method (ang onlinear beam sta cess porting and inter	tions and internal f le of rotation meth atics mal forces in spatia	forces of statical nod) according to al beam structure	ly indeterm o I. and II. t es	ninate pla	ane syste	ms using	the
Contents: - Kinematics - Determination of deformation varia - Introduction to no - Load-bearing proo - Calculation of sup Course attendance	the support react ble method (ang onlinear beam sta cess porting and inter time (in mandate	tions and internal f le of rotation meth atics mal forces in spatia	forces of statical nod) according to al beam structure Workload (in 1	ly indeterm b I. and II. t es hours)	hinate pla	ane syste rder	ms using	the
Contents: - Kinematics - Determination of deformation varia - Introduction to no - Load-bearing proc - Calculation of sup	the support react ble method (ang onlinear beam sta cess porting and inter time (in mandate	tions and internal f le of rotation meth atics mal forces in spatia	forces of statical nod) according to al beam structure Workload (in l Course attend	ly indeterm o I. and II. t es hours) ance time	hinate pla heory. O	ane syste rder study		the
Contents: - Kinematics - Determination of deformation varia - Introduction to no - Load-bearing proo - Calculation of sup Course attendance	the support react ble method (ang onlinear beam sta cess porting and inter time (in mandate	tions and internal f le of rotation meth atics mal forces in spatia	forces of statical nod) according to al beam structure Workload (in I Course attend Lecture	ly indeterm o I. and II. t es hours) ance time 30 h	hinate pla heory. O Home s Course	ane syste rder	anying	the 120 h
 Determination of deformation varia Introduction to no Load-bearing proc Calculation of sup 	the support react ble method (ang onlinear beam sta cess porting and inter time (in mandate	tions and internal f le of rotation meth atics mal forces in spatia	forces of statical nod) according to al beam structure Workload (in l Course attend	ly indeterm o I. and II. t es hours) ance time	hinate pla heory. O Home s Course	ane syste rder study accompa	anying	
Contents: - Kinematics - Determination of deformation varia - Introduction to no - Load-bearing proo - Calculation of sup Course attendance	the support react ble method (ang onlinear beam sta cess porting and inter time (in mandato Michael Hansen	tions and internal f le of rotation meth atics mal forces in spatia	forces of statical nod) according to al beam structure Workload (in l Course attend Lecture Exercise	ly indeterm o I. and II. t es hours) ance time 30 h 30 h	hinate pla heory. O Home s Course	ane syste rder study accompa	anying	
Contents: - Kinematics - Determination of deformation varia - Introduction to no - Load-bearing proo - Calculation of sup Course attendance Prof. DrIng. habil.	the support react ble method (ang onlinear beam sta cess porting and inter time (in mandato Michael Hansen	tions and internal f le of rotation meth atics mal forces in spatia	forces of statical nod) according to al beam structure Workload (in l Course attend Lecture Exercise Other	ly indeterm o I. and II. t es hours) ance time 30 h 30 h	hinate pla heory. O Home s Course	ane syste rder study accompa	anying	120 h
Contents: - Kinematics - Determination of deformation varia - Introduction to no - Load-bearing proo - Calculation of sup Course attendance Prof. DrIng. habil. Total classroom tim	the support react ble method (ang onlinear beam sta cess porting and inter time (in mandato Michael Hansen	tions and internal f le of rotation meth atics mal forces in spatia	forces of statical nod) according to al beam structure Workload (in l Course attend Lecture Exercise Other	ly indeterm o I. and II. t es hours) ance time 30 h 30 h	hinate pla heory. O Home s Course	ane syste rder study accompa	anying	120 h

Allocation to course	e of study	Module name		Course	code	Internal	Last updat	ted
Master's Degre	ee in Civil	Composite o	construction	MB	SV-13		01.09.20	018
Engineering		Composite						
Study semester 8th semester	Offered in SS			Credit 6 CP	ooints		Semester 4 SWS	week hours
Allocation to study		Responsible for modul	le		f teaching,	group size,	if applicable	e
Structural civil e		Prof. DrIng. Stef					d exercise	
Can also be credited	d to study program	_			ge of instr	uction		
-		la Cara	Deserves de deser	Germ	nan			
Requirements acco	rding to examination regu	ulations	Recommended pre	requisites				
Study/examination	achievements/ examinat	ion types	If applicable, weigh	iting of the s	tudv/exam	ination ach	ievements	
Written exami								
-								
Module objectiv	ves/desired learning	outcomes:	1					
moutie objecti		, outcomes.						
Students								
 know the mo 	st important materia	al properties of struc	ctural steel, reinfo	orcing ste	el, concr	ete and o	composite	s,
		fety concept in relat	tion to composite	e-specific s	safety fa	ctors and	l the basic	: European
-	ards in composite co							
	t in verifying the stru	ictural safety of simp	ple composite be	ams, colu	mns and	slabs in a	accordanc	ce with
standards,	ic fire design proced	ures for steel and co	mposite steel co	nstruction				
	ic file design proced		steel co		1.			
Contents:								
Introduction	to composite constr	uction						
 Material prop 	perties of structural s	steel, reinforcing ste	el, concrete and	composite	es			
	0	imple composite stru	uctures (beams, o	columns, s	slabs)			
Introduction								
	he design procedure							
Basic principl	es of design in case	of fire						
			1					
Course attenda	nce time (in mandat		Workload (in h					
Assistant lectu	rer	4 LVS	Course attenda		Home			1
		-	ł – – – – – – – – – – – – – – – – – – –	60 h		accompa		122
		-	Exercise		and ex	am prepa	aration	120 h
		-	Other					
Total classroom	n time	4 LVS	Total workload					180 h
Optional extra								
Literature								
is listed in Stu	d IP							
			-					

Allocation to course	e of study	Module name		Course code	Internal	Last updated
Master's Degre Engineering	ee in Civil	Advanced pr	oject in water	MBV 31		01.09.2018
Study semester 9th semester	Offered in WS	engin	eering	Credit points 6 CP	1	Semester week hours 4 SWS
Allocation to study Water and traffi	1	Responsible for modu Prof. DrIng. Gür		Type of teaching, Project work		if applicable ervision in groups
Can also be credited	d to study program			Language of instr German	uction	
Requirements acco	rding to examination re	egulations	Recommended prereq	uisites		
			Good knowledge	of CAD		
Study/examination	achievements/ examir	nation types	If applicable, weighting	g of the study/exam	nination ach	nievements
Project work w	ith colloquium					
Module objectiv	ves/desired learni	ng outcomes:				
	nydraulic engineer	ently on an engineerii ing, urban water man			-	nent (hydrology, wate r conditions identical
	ndependent, if neo ts in terms of qua	cessary unconventionality and quantity.	al solutions, and des	cribe their tech	nical, ecc	ological and
Depending on	the task, they enha	ance their skills in wor of the solutions in an				ns.

Contents:

The tasks vary according to demand, but they should be based on current problems in the respective field. The following project topics are given only as examples:

- Hydrology
- Water management
- Water engineering
- Laboratory/semi-industrial/large-scale tests for the elimination of substances or groups of substances from (waste) water
- Design of special process engineering units for wastewater treatment, partial flow treatment, etc.
- Planning of modifications in the process chain for sludge treatment
- Planning of a biogas plant
- Design of an I&C concept for a process plant, including the preparation of the functional specification and the P&I flow diagrams

Course attendance time (in mandato	ry hours - LVS)	Workload (i	in hours)		
Prof. Dr. G. Bahre and/or	4 LVS	Course atte	ndance time	Home study	
Prof. Dr. A. Stödter	-	Lecture	15 h	Course accompanying	
	-	Exercise	45 h	and exam preparation	120 h
	-	Other			
Total classroom time	4 LVS	Total workl	oad		180 h
Optional extra		•			•
Project-accompanying supervision					
Literature					
is listed in Stud.IP					

Allocation to course	e of study	Module name		Course of	code	Internal	Last updat	ted
Master's Degre	e in Civil	Process en	gineering in	MB	V 32		01.09.20	018
Engineering Study semester	Offered in		management	Credit p	oints		Semester	week hours
8th semester	SS		management	6 CP	011105		4 SWS	Week Hours
Allocation to study		Responsible for modu	ıle				if applicable	5
Water and traffic		Prof. DrIng. Gü	nther Bahre			exercises		
an also be credited	d to study program			Germa	ge of instri an	uction		
equirements acco	ding to examination regu	llations	Recommended prere		un			
tudy/examination	achievements/ examinati	ion types	If applicable, weighting	ng of the st	udy/exam	ination ach	ievements	
Student resear	ch paper with colloq	uium						
-								
Iodule objectiv	ves/desired learning	outcomes:						
	a basic understandin o independently det	-		-				
 classification substances, reenthalpy). System analysicascade systeminterpretation Introduction freethods for t Independent 	al substance convers of enzymes, biochen eaction kinetics of m sis (flow behavior of m, flow in systems w n of measurement re to the simulation of l he determination of set up and performa rder. determination	nical conversions of icrobiological system vith recirculation, fl sults (dead spaces, biochemical proces model parameters ince of laboratory t	f hydrocarbons, bio ms, batch systems, s, flow in a totally n ow behavior in rea short-circuit flows ses (methods for th s, presentation of th ests, e.g. adsorptio	chemical flow-thr nixed rea systems , applica e formul e ASM	conver ough sy ctor, flo , measu tion exa ation of	sions of in stems, er w in a plu rements imples f biochem	norganic nergy com ug reactor of flow bo nical mode	version, r, flow in ehavior, els,
 Microbiologic classification substances, re enthalpy). System analys cascade syste interpretation Introduction f methods for t Independent reactions 1 O 	of enzymes, biochen eaction kinetics of m sis (flow behavior of m, flow in systems w n of measurement re to the simulation of l he determination of set up and performa rder, determination	nical conversions of icrobiological system theoretical system with recirculation, fl soults (dead spaces, biochemical proces model parameters ince of laboratory t of residence time d	f hydrocarbons, bio ms, batch systems, s, flow in a totally n ow behavior in rea short-circuit flows ses (methods for th s, presentation of th ests, e.g. adsorptio listributions, etc.	chemical flow-thr nixed rea systems , applica e formul e ASM n, gas exc n, gas exc	conver ough sy ctor, flo , measu tion exa ation of change,	sions of in stems, er w in a plu rements mples biochem precipita	norganic nergy com ug reactor of flow bo nical mode	version, r, flow in r ehavior, els,
 Microbiologic classification substances, re enthalpy). System analys cascade syste interpretation Introduction f methods for t Independent reactions 1 O 	of enzymes, biochen eaction kinetics of m sis (flow behavior of m, flow in systems w n of measurement re to the simulation of l he determination of set up and performa rder, determination	nical conversions of icrobiological system theoretical system with recirculation, fl esults (dead spaces, biochemical proces model parameters ince of laboratory t of residence time d	f hydrocarbons, bio ms, batch systems, s, flow in a totally n ow behavior in rea short-circuit flows ses (methods for th s, presentation of th ests, e.g. adsorptio listributions, etc. Workload (in hou Course attendam	chemical flow-thr nixed rea systems , applica e formul e ASM n, gas exc n, gas exc urs) ce time	conver ough sy ctor, flo , measu tion exa ation of change, Home	sions of in stems, er w in a plu rements imples biochem precipita	norganic nergy com of flow be nical mode	version, r, flow in a ehavior, els,
 Microbiologic classification substances, re enthalpy). System analys cascade syste interpretation Introduction f methods for t Independent reactions 1 O 	of enzymes, biochen eaction kinetics of m sis (flow behavior of m, flow in systems w n of measurement re to the simulation of l he determination of set up and performa rder, determination	nical conversions of icrobiological system theoretical system with recirculation, fl soults (dead spaces, biochemical proces model parameters ince of laboratory t of residence time d	f hydrocarbons, bio ms, batch systems, s, flow in a totally n ow behavior in rea short-circuit flows ses (methods for th s, presentation of th ests, e.g. adsorptio listributions, etc. Workload (in hou Course attendant Lecture 5	chemical flow-thr nixed rea systems , applica e formul ne ASM n, gas exc n, gas exc urs) ce time 0 h	conver ough sy ctor, flo , measu tion exa ation of change, Change	sions of in stems, er w in a plu rements imples biochem precipita study accompa	norganic nergy com of flow be nical mode ution/floce	version, r, flow in ehavior, els, culation,
 Microbiologic classification substances, re enthalpy). System analys cascade syste interpretation Introduction f methods for t Independent reactions 1 O 	of enzymes, biochen eaction kinetics of m sis (flow behavior of m, flow in systems w n of measurement re to the simulation of l he determination of set up and performa rder, determination	nical conversions of icrobiological system theoretical system with recirculation, fl soults (dead spaces, biochemical proces model parameters ince of laboratory t of residence time d	f hydrocarbons, bio ms, batch systems, s, flow in a totally n ow behavior in rea short-circuit flows ses (methods for th s, presentation of th ests, e.g. adsorptio listributions, etc. Workload (in how Course attendant Lecture 5 Exercise 1	chemical flow-thr nixed rea systems , applica e formul e ASM n, gas exc n, gas exc urs) ce time	conver ough sy ctor, flo , measu tion exa ation of change, Change	sions of in stems, er w in a plu rements imples biochem precipita	norganic nergy com of flow be nical mode ution/floce	version, r, flow in a ehavior, els,
 Microbiologic classification substances, re enthalpy). System analys cascade syste interpretation Introduction f methods for t Independent reactions 1 O Course attenda Prof. Dr. G. Bah 	of enzymes, biochen eaction kinetics of m sis (flow behavior of m, flow in systems w n of measurement re to the simulation of l he determination of set up and performa rder, determination	theoretical system vith recirculation, fl esults (dead spaces, biochemical proces model parameters ince of laboratory t of residence time d sory hours - LVS) 4 LVS - - -	f hydrocarbons, bio ms, batch systems, s, flow in a totally n ow behavior in rea short-circuit flows ses (methods for th s, presentation of th ests, e.g. adsorptio listributions, etc. Workload (in hou Course attendam Lecture 5 Exercise 1 Other	chemical flow-thr nixed rea systems , applica e formul ne ASM n, gas exc n, gas exc urs) ce time 0 h	conver ough sy ctor, flo , measu tion exa ation of change, Change	sions of in stems, er w in a plu rements imples biochem precipita study accompa	norganic nergy com of flow be nical mode ution/floce	version, r, flow in ehavior, els, culation, 120 h
 Microbiologic classification substances, re enthalpy). System analys cascade syste interpretation Introduction f methods for t Independent reactions 1 O Course attenda Prof. Dr. G. Bah Total classroom 	of enzymes, biochen eaction kinetics of m sis (flow behavior of m, flow in systems w n of measurement re to the simulation of l he determination of set up and performa rder, determination	nical conversions of icrobiological system theoretical system with recirculation, fl soults (dead spaces, biochemical proces model parameters ince of laboratory t of residence time d	f hydrocarbons, bio ms, batch systems, s, flow in a totally n ow behavior in rea short-circuit flows ses (methods for th s, presentation of th ests, e.g. adsorptio listributions, etc. Workload (in how Course attendant Lecture 5 Exercise 1	chemical flow-thr nixed rea systems , applica e formul ne ASM n, gas exc n, gas exc urs) ce time 0 h	conver ough sy ctor, flo , measu tion exa ation of change, Change	sions of in stems, er w in a plu rements imples biochem precipita study accompa	norganic nergy com of flow be nical mode ution/floce	version, r, flow in ehavior, els, culation,
 Microbiologic classification substances, re enthalpy). System analys cascade syste interpretation Introduction f methods for t Independent reactions 1 O Course attenda Prof. Dr. G. Bah 	of enzymes, biochen eaction kinetics of m sis (flow behavior of m, flow in systems w n of measurement re to the simulation of l he determination of set up and performa rder, determination	theoretical system vith recirculation, fl esults (dead spaces, biochemical proces model parameters ince of laboratory t of residence time d sory hours - LVS) 4 LVS - - -	f hydrocarbons, bio ms, batch systems, s, flow in a totally n ow behavior in rea short-circuit flows ses (methods for th s, presentation of th ests, e.g. adsorptio listributions, etc. Workload (in hou Course attendam Lecture 5 Exercise 1 Other	chemical flow-thr nixed rea systems , applica e formul ne ASM n, gas exc n, gas exc urs) ce time 0 h	conver ough sy ctor, flo , measu tion exa ation of change, Change	sions of in stems, er w in a plu rements imples biochem precipita study accompa	norganic nergy com of flow be nical mode ution/floce	version, r, flow in ehavior, els, culation, 120 h

Allocation to course		Module name		Course coo	de Int	ternal	Last updated
Master's Degre Engineering	e in Civil	Multifunctio	nal hydraulio	MBV	/ 33		01.09.2018
Study semester 8th semester Allocation to study	Offered in SS		ng facilities	Credit poir 6 CP	nts eaching, grou	in size, i	Semester week hours 4 SWS
Water and traffi		Prof. DrIng. Axel			on w. pres		ons for knowledge
Can also be credite	d to study program	-		Language	of instruction and Engli		
Requirements acco	rding to examination regu	llations	Recommended prer	equisites			engineering from
			Bachelor's prog	-	nent, nyai	laune	
Study/examination Seminar paper	achievements/ examinati	ion types	If applicable, weight	ing of the stud	dy/examinati	ion achi	evements
	ves/desired learning						
transportation Specific knowle knowledge in s In addition, pa	vledge in planning ar hydraulic engineerin edge in energy econc teel hydraulic engine rticipation in a field t good working knowle	ng, taking into accou omics and ecology Sp eering rip to a hydraulic en	nt competing use pecific gineering facility	S			uction, and inland
Contents:							
 Design and o Planning guid Conversion, r Hydraulic ste 	ntrol s for multifunctional perating modes of hy lelines, design princij enovation and furth el structures (closure nples/excursion	ydropower plants ples and dimensioni er development of e	ng approaches for existing facilities	dams		the wa	aterfront
Course attenda	nce time (in mandat	ory hours - LVS)	Workload (in ho	urs)			
Prof. Dr. A. Stö		2 LVS	Course attendar		Home stud	ly	
Prof. Dr. S. Ste		2 LVS			Course acc	-	nying
	•	-	1	25 h a	and exam p	-	
		-		25 h			
Total classroon	n time	4 LVS	Total workload				180 h
Optional extra							
Literature is listed in Stu	d.IP						

Allocation to course	e of study	Module name		Course code	Internal	Last updated
Master's Degre	e in Civil			NAD\/ 24		01.09.2018
Engineering		Sustainal	ble water	MBV 34		01.09.2018
Study semester	Offered in			Credit points		Semester week hours
9th semester	WS	resources m	nanagement	6 CP		4 SWS
Allocation to study	specialization	Responsible for modul	е	Type of teaching,	group size,	if applicable
Water and traffic	engineering	Prof. Dr.Ing. Axel	Stödter	Lecture, semi	nar, com	outer exercises
Can also be credited	d to study program	-		Language of instr	uction	
-				German and I	English	
Requirements accor	rding to examination regu	lations	Recommended prereq	luisites		
			Hydraulics, water	management,	hydraulic	engineering from
			Bachelor's progra	im		
Study/examination	achievements/ examinati	on types	If applicable, weightin	g of the study/exam	ination ach	ievements
Oral examinati	on					
-						

Module objectives/desired learning outcomes:

Seen globally, water as a resource is not balanced between anthropogenic influences and its own regenerative power. As a result, it is essential to manage it in a sustainable manner, both ecologically and economically, throughout the world. For the water sector, this can be described by the term "Integrated Water Resources Management" (IWRM).

Students gain insight into the theory and methodology of water management, acquire basic knowledge of hydrologic planning tools, and the design of hydraulic engineering facilities for storage and irrigation and drainage. They also learn about innovative approaches to "sustainable, ecological management". Lectures and, in some cases, computer-aided calculation methods are used. A good working knowledge of English may also be required.

Contents:

- Surface and groundwater availability
- Systems theory and methodology for water management and sustainable planning
- Simulation methods: Precipitation-runoff modeling, storage models
- Concrete approaches in water resources management
- Irrigation, drainage/rewetting and extensification
- Practical examples

Course attendance time (in mandatory hour	rs - LVS)	Workload (in	hours)		
Prof. Dr. A. Stödter	4 LVS	Course attend	lance time	Home study	
Assistant lecturer, if applicable	-	Lecture	30 h	Course accompanying	
	-	Exercise	30 h	and exam preparation	120 h
	-	Other			
Total classroom time	4 LVS	Total workloa	d		180 h
Optional extra					•
Literature					
is listed in Stud.IP					

Allocation to course of study	Module name		Course c	ode	Internal	Last update	:d
Master's Degree in Civil Engineering	Water	quality	MB	V 35		01.09.20	18
Study semester Offered in 8th semester SS Allocation to study specialization Water and traffic engineering	Responsible for modul Prof. DrIng. Gün		Lectur	teaching, e with e	exercises	Semester w 4 SWS if applicable	eek hours
Can also be credited to study program			Language Germa	e of instru an	uction		
Requirements according to examination re	egulations	Recommended p					
		lf eventionale			in etiene eele		
Study/examination achievements/ examin Student research paper with collo -		If applicable, wei	gnung of the stu	uuy/exam	ination ach	levements	
Module objectives/desired learning	ng outcomes:	,					
Students understand the classific directives; as well as the impleme They are able to assess the water in terms of quality and quantity. They are also able to evaluate the hydraulics. They are able to plan and dimens basic understanding of how to co	entation into national quality of surface war e impacts of stormwat ion stormwater treatr	law. ters according t ter and combine ment measures.	to chemical, b ed sewer disc	biologic charges	al and sti	ructural qu	ality criteria
 Water quality (historical develop biological water quality, saprobi Emission-oriented assessment of no. 3, determination of the period Treatment of stormwater (over (A 117), further treatment of sto Assessment and elimination of it Water quality of standing water Introduction to water quality m 	ic index, chemical wat of combined and storn missible discharge qua view of systems, storn prmwater, mechanical micropollutants	er quality, acidi n water dischar antity, proof of nwater overflov	ity index, wat ges into wate oxygen conce w basins (A 1	ter stru er bodie entratio 28), sto	ctural qu es (introd on, proof	ality) luction of E of ammon	ia toxicity)
Course attendance time (in mand	atory hours - LVS)	Workload (in	hours)				
Prof. Dr. G. Bahre	3 LVS	Course attend		Home s	-		
Prof. Dr. K. Petersen	1 LVS	Lecture			accompa am prepa		120 h
	-	Exercise Other	10 h	anuexa	ani prepa	ation	12011
Total classroom time	4 LVS	Total workloa	ad				180 h
Optional extra	I	1					
Literature is listed in Stud.IP							

Allocation to course	e of study	Module name		Course cod	de	Internal	Last upda	ted
Master's Degre	e in Civil	Plant engine	ering in urbai	MBV	36		01.09.2	018
Engineering Study semester	Offered in		anagement	Credit poin	nts		Semester	week hou
9th semester	WS		•	6 CP			4 SWS	
llocation to study Water and traffi		Responsible for mode				roup size,	if applicabl	e
	d to study program	Prof. DrIng. Gü	nther Bahre	Lecture Language d		tion		
-				German				
equirements acco	rding to examination	regulations	Recommended prere	quisites				
tudy/examination	achievements/ exam	ination types	If applicable, weighti	ng of the study	y/examin	nation ach	ievements	
Oral examinati	on							
-								
Iodule objectiv	ves/desired learn	ing outcomes:						
 Systems for e Elements of r equipment, g Elements of t Protection of Special and n advanced oxi Basic principl 	quipment markir nachine-technica as tanks, gas utili he EMSR technica process plants ag ewer wastewater dation processes, es of industrial w	al equipment gainst lightning strikes treatment processes	fication, requirements, fittings, pumps, co and power surges (e.g. biofiltration, n characterization of	ompressors nembrane p wastewate	orocesso er and as	es, adsc	·	gradabili
 Drawing repr Systems for e Elements of r equipment, g Elements of t Protection of Special and n advanced oxi Basic principl Special proce 	quipment markir nachine-technica as tanks, gas utili he EMSR technica process plants ag ewer wastewater dation processes, es of industrial w sses for industria	ng, performance specif l equipment (pipelines zation, etc.). al equipment gainst lightning strikes treatment processes etc.) astewater treatment,	ication, requirements, fittings, pumps, co and power surges (e.g. biofiltration, n characterization of nt, areas of applicat Workload (in ho Course attendan Lecture 5 Exercise 5	mpressors nembrane p wastewate tion, limits o urs) ce time H 5 h C	orocesso or and a of use	es, adsc ssessme	ent of deg	gradabili 120 h
 Drawing repr Systems for e Elements of r equipment, g Elements of t Protection of Special and n advanced oxi Basic principl Special proce 	quipment markir nachine-technica as tanks, gas utili he EMSR technica process plants ag ewer wastewater dation processes, es of industrial w sses for industria nce time (in man	datory hours - LVS)	ication, requirements, fittings, pumps, co and power surges (e.g. biofiltration, n characterization of nt, areas of application Workload (in ho Course attendan Lecture 5	mpressors nembrane p wastewate ion, limits c urs) ce time H 5 h C	orocesso or and a of use	es, adsc ssessme udy accompa	ent of deg	

Literature is listed in Stud.IP

	e of study	Module name		Course co		Internal	Last updated
Master's Degre Engineering		Mobility m	anagement	MB			04.08.2018
Study semester 8th semester	Offered in SS			Credit po 6 CP	oints		Semester week ho 4 SWS
Allocation to study		Responsible for modu	le	Type of to			if applicable
Water and traffi		N.N.		Lecture	e, exerc		
an also be credite	d to study program			Germa		uction	
Requirements acco	rding to examination re	egulations	Recommended prei	equisites			
			Completion of			•	
	achievements/ examination		If applicable, weigh	ting of the stu	idy/exam	ination ach	nievements
- Student resear	ch paper with coll	oquium					
Andula abiactiv	ves/desired learni	ng outcomoci					
 Ability to set management Ability to eng strategy in a Ability to inde) age in technical di mobility context a ependently derive	eristics mobility context in a w scussion, evaluation o s a key competency mobility strategies tal y competence of inter	f strategies, and o	decision ma the integra	aking to ation of	o determi	
 Management Marketing str Mobility effect Participation 	rategies cts procedures						
Contents: • Management • Marketing str • Mobility effer • Participation • Sustainability • Mobility cons	rategies cts procedures						
 Management Marketing str Mobility effer Participation 	rategies cts procedures						
 Management Marketing str Mobility effer Participation Sustainability 	rategies cts procedures						
 Management Marketing str Mobility effer Participation Sustainability 	rategies cts procedures						
 Management Marketing str Mobility effer Participation Sustainability 	rategies cts procedures						
 Management Marketing str Mobility effer Participation Sustainability 	rategies cts procedures						
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 Management Marketing str Mobility effer Participation Sustainability 	rategies cts procedures						
 Management Marketing str Mobility effer Participation Sustainability Mobility constructions 	rategies cts procedures sulting	latory hours - LVS)	Workload (in ho	Durs)			
 Management Marketing str Mobility effer Participation Sustainability Mobility cons 	rategies cts procedures sulting nce time (in manc	latory hours - LVS)	Workload (in ho Course attendat		Homes	study	
 Management Marketing stri Mobility effer Participation Sustainability Mobility cons 	rategies cts procedures sulting nce time (in manc		Course attenda	nce time 50 h	Course	accompa	
 Management Marketing stri Mobility effer Participation Sustainability Mobility cons 	rategies cts procedures sulting nce time (in manc		Course attendar Lecture Exercise	nce time 50 h	Course		
 Management Marketing str Mobility effer Participation Sustainability Mobility cons 	nce time (in mand	4 LVS - - - -	Course attendar Lecture Exercise Other	nce time 50 h	Course	accompa	aration 120
 Management Marketing str Mobility effer Participation Sustainability Mobility cons 	nce time (in mand		Course attendar Lecture Exercise	nce time 50 h	Course	accompa	
 Management Marketing str Mobility effer Participation Sustainability Mobility cons 	nce time (in mand	4 LVS - - - -	Course attendar Lecture Exercise Other	nce time 50 h	Course	accompa	aration 120

Allocation to course of study	Module name		Course	code	Internal	Last upda	ted
Master's Degree in Civil			MB	SV 38		04.08.2	018
Engineering	Mobilit	y impact					
Study semester Offered in		y impace	Credit p	points			week hours
9th semester WS	Decreasible for mod	de	6 CP	tooching	aroun cizo	4 SWS	0
Allocation to study specialization Water and traffic engineering	Responsible for modu	uie		ire, exer	group size, cise	п аррисари	e
Can also be credited to study program				ge of instr			
-			Germ	nan			
Requirements according to examination r	egulations	Recommended pr Participation		VIB\/_27	Mobility	manager	oont
Study/examination achievements/ examin	nation types	If applicable, weig					lent
Student research paper with coll			,				
-							
Aodule objectives/desired learni	ing outcomes:	1					
 Ability to independently derive Ability to design traffic develop related, interdisciplinary factors 	oment projects taking	into account the	-				
action	, us a ney competence			·			
action Contents: • Traffic behavior • Environmental impact • Traffic-spanning measures • Traffic calming • Traffic reduction • Impact analyses		Workload (in Course attend Lecture Exercise	hours)	Home	study accompa am prepa		120 h
action Contents: • Traffic behavior • Environmental impact • Traffic-spanning measures • Traffic calming • Traffic reduction • Impact analyses • Success checks • Success checks	datory hours - LVS)	Workload (in Course attend Lecture	hours) ance time 50 h 10 h	Home	accompa		120 h

Literature

Allocation to course	e of study	Module name		Course code	Internal	Last updated
Master's Degre Engineering	e in Civil	Local public ti	ransportation	MBV 39		01.09.2018
Study semester 9th semester	Offered in WS	_		Credit points 6 CP		Semester week hours 4 SWS
Allocation to study s Water and traffic Can also be credited	c engineering	Responsible for modul	e	Type of teaching, Lecture Language of instr German		if applicable
Requirements accor	rding to examination regu	ulations	Recommended prereq			
Study/examination Written examir	achievements/ examinat nation (K2)	ion types	If applicable, weighting	g of the study/exan	nination ach	ievements
Module objectiv	ves/desired learning	outcomes:				
 Knowledge ar Ability to und 	nd understanding of erstand practical co	of organization and system interrelation ntexts and implement publ	ships in local public	c transport		S
Contents:						
 Financing Local public to Network plan Differentiated Mobility deve Tariff cooperation Marketing str 	d operating modes lopment, multimod ations / transport as	ality sociations				
Course attenda	nce time (in mandat	tory hours - LVS)	Workload (in hou	rs)		
DiplIng. A. Ma	arkwart, M.Sc.	4 LVS	Course attendance		-	
		-	Lecture 60 Exercise		accompa am prepa	
		-	Other			
Total classroom Optional extra	time	4 LVS	Total workload			180 h
Literature is listed in Stud	d.IP					

				Course o	code	Internal	Last updat	
Master's Degree Engineering	ee in Civil	Road traffic	c engineering	MB	V 40		04.08.2	018
tudy semester 8th semester	Offered in SS			Credit p	oints		Semester 4 SWS	week hour
llocation to study		Responsible for mod	ule		teaching,	group size,	if applicable	2
Nater and traffi		N.N.			har teac			
an also be credite	d to study program			Germa	ge of instri an	uction		
equirements acco	rding to examination re	egulations	Recommended prer					
					1 /			
	achievements/ examin ch paper with collo		If applicable, weight	ing of the sti	udy/exam	ination ach	lievements	
	/es/desired learnin							
quality • In-depth kno • Ability to bui • Ability to ind	wledge of the cons d a complex simula ependently develo elop and evaluate	gnal control of traffic struction of microsco ation model in VISSII p traffic dependent s solutions for transpo	pic simulation moc VI signal controls	lels				
ntroduction to evaluation Jsing the VISSI unsignalized in Building your o Evaluation and	M simulation softw tersections and roo wn simulation mod assessment of traf		, editing of routes, ulation model; dev	signalized	d and			
ntroduction to evaluation Jsing the VISSI insignalized in Building your o Evaluation and of traffic-deper	M simulation softw tersections and rou wn simulation mod assessment of traf ndent signal contro	vare: Basic principles undabouts del ffic quality in the sim ols and application in	, editing of routes, ulation model; dev	signalized	d and			
ntroduction to evaluation Using the VISSI insignalized in Building your o Evaluation and of traffic-deper	M simulation softw tersections and rou wn simulation mod assessment of traf indent signal contro	vare: Basic principles undabouts del ffic quality in the sim Is and application in atory hours - LVS)	s, editing of routes, ulation model; dev the simulation mo	signalized elopment del urs)	d and			
ntroduction to evaluation Using the VISSI unsignalized in Building your o Evaluation and of traffic-deper	M simulation softw tersections and rou wn simulation mod assessment of traf indent signal contro	vare: Basic principles undabouts del ffic quality in the sim ols and application in	s, editing of routes, ulation model; dev the simulation mo Workload (in ho Course attendar	signalized elopment del uurs) ace time	d and			
ntroduction to evaluation Using the VISSI insignalized in Building your o Evaluation and of traffic-deper	M simulation softw tersections and rou wn simulation mod assessment of traf indent signal contro	vare: Basic principles undabouts del ffic quality in the sim Is and application in atory hours - LVS)	s, editing of routes, ulation model; dev the simulation mo Workload (in ho Course attendar Lecture	signalized elopment del urs) uce time	d and	accompa		120 h
evaluation Jsing the VISSI Insignalized in Building your o Evaluation and of traffic-deper	M simulation softw tersections and rou wn simulation mod assessment of traf indent signal contro	vare: Basic principles undabouts del ffic quality in the sim Is and application in atory hours - LVS)	s, editing of routes, ulation model; dev the simulation mo Workload (in ho Course attendar Lecture	signalized elopment del uurs) ace time	d and			120 h
ntroduction to evaluation Jsing the VISSI unsignalized in Building your o Evaluation and of traffic-deper	M simulation softw tersections and rou wn simulation mod assessment of traf ndent signal contro nce time (in mand D. Seebo	vare: Basic principles undabouts del ffic quality in the sim Is and application in atory hours - LVS)	s, editing of routes, ulation model; dev the simulation mo Workload (in ho Course attendar Lecture	signalized elopment del urs) uce time	d and	accompa		120 h

Allocation to course	e of study	Module name		Course c	ode	Internal	Last update	ed
Master's Degre Engineering	ee in Civil	Urban st	reetscape	MB	V 41		04.08.20)18
Study semester 9th semester Allocation to study Water and traffi	cengineering	Plar Responsible for modu N.N.	nning ^{Jle}	Semin	teaching, ar teach	ning	Semester v 4 SWS if applicable	veek hours
Can also be credite	d to study program			Languag Germa	e of instru	uction		
- Requirements acco	rding to examination regu	lations	Recommended p					
			Participation		1BV-42	Municipa	l traffic co	ncepts
	achievements/ examinati ch paper with colloq		If applicable, weig	ghting of the stu	udy/exam	ination ach	ievements	
Module objectiv	ves/desired learning	outcomes:						
 the ability to requirements the ability to social competition social competition Social competition Survey of a constraints Representation 	wledge of methods a independently create and local constraint evaluate different pl tence through coope ommunity transporta	e a design for real s s, anning alternatives eration with externa	street space with	n appropriate				2
 Target definit Deficiency an 	f the traffic load ions for integrated t alysis development of a tra		lopment					
Course attenda	nce time (in mandat	ory hours - LVS)	Workload (in	hours)				
HonProf. Dr.	D. Seebo	2 LVS	Course attend	lance time	Home s	study		
Assistant lectu	rer	2 LVS	Lecture	45 h		accompa		1051
		-	Exercise	15 h	and exa	am prepa	iration	120 h
		-	Other	<u> </u>				
Total classroom Optional extra	1 time	4 LVS	Total workloa	d				180 h
Literature								
is listed in Stu	d.IP							

Mater's Degree in Civil Engineering: Municipal traffic concepts MBV 42 Decay 2018 Study member is an expension of study opeculation Water and traffic regimeering - Preservation of the study opeculation - Semiphone water is a point of the study opeculation - Semiphone water is a point of the study opeculation - Semiphone water is a point of the study opeculation - Concernents according to communitor regulation - Preservation of the study/communitor active-wenests If applicable, weighting of the study/communitor active-wenests Studen trassarch paper with colloquium - If applicable, weighting of the study/communitor active-wenests If applicable, weighting of the study/communitor active-wenests Studen trassarch paper with colloquium - If applicable, weighting of the study/communitor active-wenests If applicable, weighting of the study/communitor active-wenests Studen trassarch acquire - - If applicable, weighting of the study/communitor active-wenests Studen trassarch acquire - - - - View of a community transportation network - - - - • Social competence through cooperation with external institutions as well as through group work. - - • Social competence through transportation development - - - - -	Allocation to course	e of study	Module name		Course code	Internal	Last updated
Sth sensetzer SS 4 SWS Water and traffic engineering N.N. Top of textRolling, group direkting, it gangtabable Can also be created to study program It can also be creat	-	ee in Civil	Municipal tra	affic concepts	MBV 42		04.08.2018
Water and traffic engineering N.N. Seminar teaching Convation be credited to study program Image of individual of generatives Image of individual of generatives Requirements according to examination regulations Basic knowledge in the design of rural and urban roads Study/examination achievements/ examination types If applicable, weighting of the dual/examination achievements Student research paper with colloquium If applicable, weighting of the dual/examination achievements Student sequire If applicable, weighting of the dual/examination achievements Students acquire If applicable, weighting of the dual/examination achievements, examination types Students acquire If applicable, weighting of the dual/examination achievements, examination achievements, examination of qualitative and quantitative analytical methods, examination achievements acquire In indeght honowledge of the develop cross-system transportation concerpts for areal-world planning area, examination order brank in concerpts for areal-world planning area, examination of the traffic foad Survey of a community transportation network Representation of urban structures Variate definitions for integrated transportation development Variate definitions for integrated transportation development Variate definitions for integrated transportation development of a traffic concept Vorese attendance time (fin mandatory hours - 1V3)	Study semester 8th semester	SS			6 CP		4 SWS
Consists according to examination regulations Incruspend of instructions Requirements according to examination regulations Basic knowledge in the design of rural and urban roads Study/coamination achievements/ examination types Basic knowledge in the design of rural and urban roads Study/coamination achievements/ examination types If applicable, weighting of the study/examination achievements Student research paper with colloquium If applicable, weighting of the study/examination achievements Students acquire If applicable, weighting of the study/examination achievements Nowledge and understanding of the individual procedures used in traffic planning processes, If the ability to independently develop cross-system transportation concepts for a real-wolid planning area, • social completence through cooperation with external institutions as well as through group work. Second to the traffic load • Survey of a community transportation network Representation of urban structures • Calculation of the traffic load				le			if applicable
Cerran Requirements according to examination regulation If applicable, weighting of the study/examination achievements Requirements acquire Indept MonoWeideg of the development and application of qualitative and quantitative analytical methods, Indept MonoWeideg of the development and application of qualitative and quantitative analytical methods, Indept MonoWeideg of the development and application of qualitative and quantitative analytical methods, Indept MonoWeideg of the development and application of qualitative and quantitative analytical methods, Indept MonoWeideg of the development and application of qualitative and quantitative analytical methods, Indept MonoWeideg of the development and application of qualitative and quantitative analytical methods, Indept MonoWeideg of the development and application of qualitative and quantitative analytical methods, Indept MonoWeideg of the development and application of qualitative and quantitative analytical methods, Indept MonoWeideg of the development and application on external institutions as well as through group work.			N.N.			-	
Basic knowledge in the design of rural and urban roads Study/examination achievement/, examination types Study (examination achievements/ examination types Study (examination achiever) Survey of a community transportation network • Representation of urban structures • Caluation of the traffic load • Target definitions for integrated transportation development • Deficiency analysis • Independent development of a traffic concept Hon-Prof. Dr, D, Seebo 21V5	-					uction	
Study/nomination achievement/ examination types If applicable, weighting of the study/examination achievements Student research paper with colloquium If applicable, weighting of the study/examination achievements Module objectives/desired learning outcomes: Students acquire Indepth Independently develop cross-system transportation concepts for a real-world planning area, • social competence through cooperation with external institutions as well as through group work. Contents: • Survey of a community transportation network • spresentation of the traffic load • Survey of a community transportation network • Representation of the traffic load • Target definitions for integrated transportation development • Deficiency analysis • Independent development of a traffic concept Vorkload (in hours) Hom-Prof. Dr. D. Seebo 2 LVS Course attendance time (in mandatory hours - LVS) Mon-Prof. Dr. D. Seebo 2 LVS Lecture 45 h Assistant lecturer 2 LVS Lecture 45 h • Exercise 15 h and exam preparation 120 h • Dother • US Total workload 180 h	Requirements acco	rding to examination regu	ulations			frural and	l urban roads
Module objectives/desired learning outcomes: Students acquire • In-depth knowledge of the development and application of qualitative and quantitative analytical methods, • knowledge and understanding of the individual procedures used in traffic planning processes, • the ability to independently develop cross-system transportation concepts for a real-world planning area, • social competence through cooperation with external institutions as well as through group work. Students: • Survey of a community transportation network • Representation of urban structures • Jaculation of the traffic load • Target definitions for integrated transportation development • Deficiency analysis • Independent development of a traffic concept Course attendance time (in mandatory hours - LVS) Workload (in hours) Hon-Prof. Dr. D. Seebo 2 LVS Course attendance time Home study Assiata lecturer 2 LVS Lecture 45 h Course accompanying 120 h Assiata lecturer 4 LVS Total workload 180 h Optional extra 180 h	Study/examination	achievements/ examinat	ion types	-			
Students acquire • In-depth knowledge of the development and application of qualitative and quantitative analytical methods, • In-depth knowledge of the development and application of qualitative and quantitative analytical methods, • In-depth knowledge of the development and application of qualitative and quantitative analytical methods, • the ability to independently develop cross-system transportation concepts for a real-world planning area, • social competence through cooperation with external institutions as well as through group work. Contents: • Very of a community transportation network • Representation of urban structures • Calculation of the traffic load • Target definitions for integrated transportation development • Deficiency analysis • Independent development of a traffic concept Course attendance time (in mandatory hours - LVS) Workload (in hours) HonProf. Dr. D. Seebo 2 LVS Course attendance time (in mandatory hours - LVS) Workload (in hours) HonProf. Dr. D. Seebo 2 LVS Course accompanying 120 h Coptonel extra 180 h Optonel extra 180 h	Student resear	ch paper with colloq	Juium				
 in-depth knowledge of the development and application of qualitative and quantitative analytical methods, knowledge and understanding of the individual procedures used in traffic planning processes, the ability to independently develop cross-system transportation concepts for a real-world planning area, social competence through cooperation with external institutions as well as through group work. Contents: Survey of a community transportation network Representation of urban structures Calculation of the traffic load Target definitions for integrated transportation development Deficiency analysis Independent development of a traffic concept Course attendance time (in mandatory hours - LVS) Workload (in hours) Hon-Prof. Dr. D. Seebo 2 LVS Course attendance time (in mandatory hours - LVS) Hon-Prof. Dr. D. Seebo 2 LVS Course attendance time (in mandatory hours - LVS) Vorkload (in hours) Total classroom time 4 LVS Total workload 120 h Optional extra Literature Literature	Module objectiv	ves/desired learning	outcomes:				
 Survey of a community transportation network Representation of urban structures Calculation of the traffic load Target definitions for integrated transportation development Deficiency analysis Independent development of a traffic concept Course attendance time (in mandatory hours - LVS) Workload (in hours) HonProf. Dr. D. Seebo 2 LVS Course attendance time Home study Assistant lecturer 2 LVS Lecture 45 h Course accompanying and exam preparation 120 h Optional extra Literature Literature	 in-depth know knowledge and the ability to 	wledge of the develond understanding of independently deve	the individual proce lop cross-system tra	dures used in traffi nsportation concep	c planning proc ts for a real-wo	esses, orld plann	ing area,
HonProf. Dr. D. Seebo 2 LVS Course attendance time Home study Assistant lecturer 2 LVS Lecture 45 h Course accompanying and exam preparation 120 h - Exercise 15 h and exam preparation 120 h Total classroom time 4 LVS Total workload 180 h Optional extra Itterature Itterature Itterature	 Representation Calculation or Target definit Deficiency and 	on of urban structure f the traffic load ions for integrated t alysis	es ransportation devel	opment			
HonProf. Dr. D. Seebo 2 LVS Course attendance time Home study Assistant lecturer 2 LVS Lecture 45 h Course accompanying and exam preparation 120 h - Exercise 15 h and exam preparation 120 h Total classroom time 4 LVS Total workload 180 h Optional extra Iterature Iterature Iterature							
Assistant lecturer 2 LVS Lecture 45 h Course accompanying and exam preparation 120 h - Exercise 15 h and exam preparation 120 h - Other - 180 h 180 h Optional extra - - - - 180 h						at	
- Exercise 15 h and exam preparation 120 h - Other - 15 h 180 h Optional extra Image: Comparation of the state of				ł – – – – – – – – – – – – – – – – – – –		-	anving
- Other Total classroom time 4 LVS Optional extra 180 h	Assistant lectur	CI	2 LV3	ł – – – – – – – – – – – – – – – – – – –		-	
Total classroom time 4 LVS Total workload 180 h Optional extra Image: strain of the str						an prepe	
Optional extra	Total classes are	timo	-				100 L
			4 LV5				1 00 N

Study/examination and Student researcl	Offered in SS ecialization engineering	Responsible for modu N.N.	maintenance d facilities ule Recommended pre BBV 69 Railroa	Credit p 6 CP Type of Lectu Langua Germ requisites	f teaching, a re with i age of instru	group size, if integrated		veek hour
Study semester 8th semester Allocation to study sp Water and traffic Can also be credited f - Requirements accord Study/examination ar Student researcl -	SS ecialization engineering to study program ing to examination reg chievements/ examinat	Responsible for modu N.N.	d facilities	Credit p 6 CP Type of Lectu Langua Germ requisites	f teaching, a re with i age of instru	group size, if integrated	4 SWS	
Water and traffic an also be credited f equirements accord tudy/examination ac Student research	engineering to study program ing to examination reg chievements/ examinat	N.N.	Recommended pre	Lectu Langua Germ requisites	ire with i Ige of instru	integrated		
an also be credited t equirements accord tudy/examination a Student researcl	to study program ing to examination reg chievements/ examinat	ulations		Langua Germ requisites	ige of instru	-	exercise	S
equirements accord udy/examination ac Student researcl	ing to examination reg chievements/ examinat			Germ				
udy/examination a Student researcl	chievements/ examinat							
Student researcl		ion types	DDV 09 Kalli Od	d constru	ction			
Student researcl			If applicable, weigh			ination achie	evements	
odule objective				0				
	s/desired learning	g outcomes:						
 are capable of are able to dra know the track know the basic 	performing vehicle w up a BETRA (con construction mac principles of shun	struction and opera hines suitable for tra	ating instructions ack maintenance	for constr and new t	uction w track con		track),	
 Calculation of f Travel time cal Railroad faciliti Requirements Use of track-lar Set up of const Shunting syste Signal box tech 	rack and effective culations and time es and railway load for the superstruct ying machines ruction and operations and technology	table designs ding gauges ture and line layout ting instructions (BE	TRA)					
Course attendan	ce time (in manda	tory hours - LVS)	Workload (in h	ours)				
		2 LVS	Course attenda		Homes			1
	r	2 LVS	Lecture	45 h	-	accompan		120 1
	1	I —	Eversian	1	1 JOO 000			/lin
HonProf. Fried Assistant lecture	<u> </u>	-	Exercise	15 h	and exa	am prepara	ation	120 h
		- - 4 LVS	Exercise Other Total workload		and exa	am prepara	ation	120 h

Allocation to course	e of study	Module name		Course code	Internal	Last updated
Master's Degre Engineering	ee in Civil	Railway ei	ngineering	MBV 44		22.08.2019
Study semester 9th semester	Offered in WS	-		Credit points 6 CP	1	Semester week hours 4 SWS
Allocation to study Water and traffic		Responsible for modul N.N.	e	Type of teaching, Lecture with i		
Can also be credited	d to study program			Language of instru German	uction	
Requirements acco	rding to examination regu	llations	Recommended prerect Successful particities	•	9 and MB	V 39
Study/examination	achievements/ examinati	on types	If applicable, weightin	g of the study/exam	ination ach	ievements
Student resear	ch paper with colloq	uium				
-						
Module objectiv	ves/desired learning	outcomes:				
can reproduc	st important basic te e and explain them,				ture and	rail operations and

- possess basic knowledge of rail transport guidelines and safety concepts,
- understand the rail transport system with its special features and interconnections,
- are able to apply the basic technical rules of planning for construction measures and to use the learned basics of building law in the implementation of the measures,
- recognize the issues construction and operation and can thus assess and evaluate the operational impact of construction measures of different sizes.

Contents:

- Railroad operations and traffic facilities
- Control and safety technology in rail traffic
- Railroad superstructure Projects and investments Maintenance Track-laying machines
- Consolidation of knowledge through excursions to actual locations
- Railway tie production at the Leonhard Moll concrete railway tie plant
- Functional principle of the MegaHub Lehrte fast transshipment facility for combined traffic
- Driving service and network dispatching at the Hannover Operations Center
- Elastomeric bearing technology in the superstructure
- Specialist planning of structural engineering for rail transport systems
- Railroad bridge inspections
- Railroad stations as interfaces between rail traffic and the city
- Sequence of events during the commissioning of rail transport facilities
- Driving and construction while maintaining rail traffic
- Application examples for the awarding of contracts and contract regulations for construction services in rail transport as well as basic principles of construction contracts for infrastructure projects
- Experience gained from an international railroad project

Course attendance time (in mandator	ry hours - LVS)	Workload (in	n hours)		
HonProf. Friedrich Pech	4 LVS	Course atter	dance time	Home study	
	-	Lecture	50 h	Course accompanying	
	-	Exercise	10 h	and exam preparation	120 h
	-	Other			
Total classroom time	4 LVS	Total worklo	ad		180 h

Literature

Allocation to cours	e of study	Module name		Course code	Internal	Last updated
Master's Degr	ee in Civil	Building	climatology	MBV 61		29.03.2019
Engineering Study semester	Offered in		0,	Credit points		Semester week hour
8th semester Allocation to study	SS	Responsible for mo	dule	6 CP Type of teaching,	group size	4 SWS
All			ans-Peter Leimer	Lecture		
Can also be credite -	d to study program			Language of instr German	uction	
Requirements acco	rding to examination re	egulations	Recommended prer	equisites		
Study/examination	achievements/ examir	ation types	If applicable, weight	ing of the study/exan	nination ach	ievements
	ithout colloquium		in applicable, weight			
-	-					
lodule objecti	ves/desired learni	ng outcomes:				
 Knowledge a Verification a 	bout the energetic according to the En	behavior of buildin	EG) or the Building E			
Knowledge aVerification a	bout the energetic according to the En	behavior of buildin ergy Saving Act (En	gs EG) or the Building E			
 Knowledge a Verification a Ability to wo 	bout the energetic according to the En rk in a team, profe	behavior of buildin ergy Saving Act (En ssional discussion, p	gs EG) or the Building E presentation	inergy Act (GEG)		
 Knowledge a Verification a Ability to wo Ability to wo 	entals of building cl th. entals of building cl th. ed examples, the ef indoor climate are tions are carried o M.	behavior of buildin ergy Saving Act (En ssional discussion, p imatology, heat and fects of building ma presented for diffe ut on the basis of ca	gs EG) or the Building E presentation d moisture protectio aterials and building	n and energy-sav climatic boundar	ry condition	ons on the building

Course attendance time (in mandatory hours	s - LVS)	Workload (in l	nours)		
Prof. Dr. P. Leimer	4 LVS	Course attend	ance time	Home study	
	-	Lecture	45 h	Course accompanying	
	-	Exercise	15 h	and exam preparation	120 h
	-	Other			
Total classroom time	4 LVS	Total workloa	d		180 h
Optional extra					

Literature is listed in Stud.IP

Allocation to course	e of study	Module name		Course code	Internal	Last updated
Master's Degre	e in Civil	Building en	ergy design	MBV 62		29.03.2019
Engineering		Dunung en				
Study semester	Offered in			Credit points		Semester week hours
8th semester	SS			6 CP		4 SWS
Allocation to study	specialization	Responsible for modu	lle	Type of teaching,	group size,	if applicable
All		Prof. DrIng. Han	ns-Peter Leimer	Lecture		
Can also be credited	d to study program			Language of instr	uction	
-				German		
Requirements acco	rding to examination reg	ulations	Recommended prere	quisites		
Study/examination	achievements/ examina	tion types	If applicable, weightin	ng of the study/exam	nination ach	ievements
Project work w	ithout colloquium					
-						
Madula abiasti	oc/docirod loornin	a outcomos:				
wodule objectiv	ves/desired learnin	g outcomes:				
Students are m	ado ablo to ovaluat	a tha halistic interra	lationships of const	truction with roc	noct to th	ne impact on energy
				inuction with res		ie impact on energy
and environme						
This includes, a	mong other things,					
 knowledge of 	the interaction and	d effects of building s	structures and build	ding physics on t	he indoo	r climate as well
as the energeti	c and indoor climat	ic behavior of buildir	ngs.			
-		of energy and clima	-	dings		
	in and development	or chergy and clinia	ite concepts of build	2010-20		

• the ability to work in a team, professional discussion, presentation

Contents:

is listed in Stud.IP

The fundamentals of building climatology, thermal and moisture protection, and energy conservation are covered in depth, and a close look is taken at the effects on the energy and building climatic performance of buildings.

• Selected examples are used to illustrate the effects of building materials and building climatic

boundary conditions on the building enclosure and indoor climate.

- In the following, different formations of the building enclosure are developed and their effects on energy consumption and indoor climate are determined.
- The investigations are carried out on the basis of calculations or numerical simulation calculations according to BIM.

The results are used for further work in the Building Energy Design module to develop energy distribution and energy generation concepts in buildings.

Course attendance time (in mandatory hour	s - LVS)	Workload (in	hours)		
Prof. Dr. P. Leimer	4 LVS	Course attend	ance time	Home study	
	-	Lecture	45 h	Course accompanying	
	-	Exercise	15 h	and exam preparation	120 h
	-	Other			
Total classroom time	4 LVS	Total workloa	d		180 h
Optional extra					
Literature					

Allocation to cours	e of study	Module name		Course code	Internal	Last updated
Master's Degre	ee in Civil	Energy Des	ign Building	MBV 63		29.03.2019
Engineering Study semester 8th semester	Offered in SS		vices	Credit points 6 CP		Semester week hours 4 SWS
Allocation to study All		Responsible for modu Prof. DrIng. Har		Type of teaching, Lecture Language of instr German		
Requirements acco	rding to examination re	gulations	Recommended prerec	quisites		
Study/examination	achievements/ examin	ation types	If applicable, weightin	ng of the study/exam	nination ach	ievements
Project work w	vithout colloquium					
- Module objectiv	ves/desired learnir	a outcomes:				
impact on ener Acquisition of i building equips Apply and imp Construction a To do so, intro	rgy and environme n-depth knowledg ment in harmony w lement in-depth kn nd the Sustainable	e for the assessment	of the necessities o account, among ot nent	f modern techni her things, the re	cal equireme	nts in Sustainable
impact on ener Acquisition of i building equips Apply and imp Construction a To do so, intro	rgy and environme n-depth knowledg ment in harmony w lement in-depth kn nd the Sustainable	ntal issues. e for the assessment rith architecture owledge, taking into Construction Assessr	of the necessities o account, among ot nent	f modern techni her things, the re	cal equireme	nts in Sustainable
impact on ener Acquisition of i building equips Apply and imp Construction a To do so, intro BIM.	rgy and environmen n-depth knowledge ment in harmony w lement in-depth kn nd the Sustainable ductory and detaile	ntal issues. e for the assessment vith architecture owledge, taking into Construction Assess ed lectures and practi	of the necessities o account, among ot ment ical exercises with c	f modern techni her things, the ro computer suppor	cal equireme t are offe	nts in Sustainable red on the basis o
impact on ener Acquisition of i building equips Apply and imp Construction a To do so, intro BIM. Contents: Energy generat Energy distribu Building install and lighting	rgy and environmen n-depth knowledge ment in harmony w lement in-depth kn nd the Sustainable ductory and detaile tion and energy cor ition concepts, e.g. ation systems for a	ntal issues. e for the assessment rith architecture owledge, taking into Construction Assessr	of the necessities o account, among ot nent ical exercises with c g. wind energy and tems, building insta building equipment	f modern techni her things, the re omputer suppor combined heat a llation t incl. evaluation	cal equireme t are offe and powe of electri	nts in Sustainable red on the basis o
impact on ener Acquisition of i building equips Apply and imp Construction a To do so, intro BIM. Contents: Energy generat Energy distribu Building install and lighting • Evaluation ar • The investiga to BIM.	rgy and environmen n-depth knowledge ment in harmony w lement in-depth kn nd the Sustainable ductory and detaile cion and energy corr ition concepts, e.g. ation systems for a nd development of tions are carried or	ntal issues. e for the assessment rith architecture owledge, taking into Construction Assess ed lectures and praction oversion concepts, e., smart grids, BUS systen Il trades of technical	of the necessities o account, among ot ment ical exercises with c g. wind energy and tems, building insta building equipment nd distribution conc culations or numeric	f modern techni her things, the re computer suppor combined heat a llation t incl. evaluation cepts for building cal simulation ca	cal equireme t are offe and powe of electri gs lculations	nts in Sustainable ared on the basis of er cal consumers s according

Course attendance time (in mandatory hours - LVS)		Workload (in hours)						
Assistant lecturer	4 LVS	Course attenda	ance time	Home study				
	-	Lecture	45 h	Course accompanying				
	-	Exercise	15 h	and exam preparation	120 h			
	-	Other						
Total classroom time	4 LVS	Total workloa	d		180 h			
Optional extra					·			

Literature

Allocation to course of study	Module name	Course code Internal Last updated								
Master's Degree in Civil Engineering		nt technology	MBV 65		29.03.2019					
Study semester Offered in 9th semester WS	in buildin	g physics	Credit points 6 CP							
Allocation to study specialization	Responsible for modul		Type of teaching,	group size,	if applicable					
All	Prof. DrIng. Han	s-Peter Leimer	Lecture/lab							
Can also be credited to study program	Can also be credited to study program		Language of instru	uction						
-				German						
Requirements according to examination regu	lations	Recommended prereq	uisites							
Study/examination achievements/ examination	ion types	If applicable, weighting of the study/examination achievements								
Project work without colloquium										
-										
Module objectives/desired learning	outcomes:									
The aim is to make students familia	r with a wide variet	y of measurement r	methods in build	ding phys	ics and to transfer the					
characteristic data measured in the	laboratory to build	ing practice.								
• Understanding of the interaction		•	narameters							
Knowledge of a wide variety of ca										

- Knowledge of a wide variety of calculation methods and simulation calcula Knowledge of the menu different testing mean during
- Knowledge of the many different testing procedures Knowledge of a wide range of building physics measurements
- Interpretation of measurement data and findings

Contents:

A wide variety of measurement and test methods for determining building physics parameters for heat, moisture and sound insulation, room acoustics and emissions are presented and practiced using measurements in the laboratory. The following form the basis for application:

- the valid test standards for recording characteristic values of building materials and building components
- the various measurement procedures and measurement methods for different areas of application
- the evaluation of measurement findings, also on the basis of a wide variety of statistical methods
- comparative performance of numerical calculations for validation and evaluation

Course attendance time (in mandatory hours	5 - LVS)	Workload (in hours)						
Prof. Dr. P. Leimer	2 LVS	Course attend	ance time	e Home study				
Assistant lecturer	2 LVS	Lecture	30	Course accompanying				
	-	Exercise	30	and exam preparation	120 h			
	-	Other						
Total classroom time	4 LVS	Total workloa	d		180 h			
Optional extra		·						
Literature								

Allocation to course of study	Module name		Course	code	Internal	Last updated				
Master's Degree in Civil	Concretet		ME	SV 77		02.07.2020				
Engineering	Concrete t	echnology I								
Study semesterOffered in9th semesterWS			Credit 6 CP			Semester week hour 6 SWS	rs			
Allocation to study specialization All	Responsible for modu			Type of teaching, group size, if applicable						
Can also be credited to study program	Prof. DrIng. Iris	Marquardt		Lecture, exercise, practical lab training Language of instruction						
-			Germ							
Requirements according to examination regu	llations	Recommended pre								
		Basic principle								
Study/examination achievements/ examinati Written examination (K2)	ion types	If applicable, weighting of the study/examination achievements								
Project work without colloquium										
Module objectives/desired learning	outcomes:									
Sound concrete technology knowle	-		-							
extended concrete technology trair	-	-	-							
Construction Technology Association theoretical E-certificate	on (Deutscher Beton	i- und Bautechni	k-verein e	V.) for t	ne acqui	ition of the				
The aim of the training is to enable	the Master's gradua	ates to work as s	enior conc	rete eng	gineers in	companies after				
passing the two modules of Concre	te Technology I and	Concrete Techn	ology II. Af	ter grad	uation, p	roof of one year o	of			
practical concrete technology work	is required. With th	ne proof of pract	ical activity	/, an app	lication f	or the issuance of	fthe			
E-certificate can be submitted.										
If you are aiming to obtain an E-cer	tificate nlease note	2.								
The duration of the exam is (differe										
For the theoretical E-certificate, 70	,		esponds to	o grade 3	3.3) is req	uired				
in the 1st exam attempt.										
Attendance is compulsory for the m	nodule.									
Contents:										
- Concrete as a building material										
- Raw materials (cement, aggregate		ires, concrete ad	ditive mixt	ures, wa	ater)					
- Purpose of a permanent concrete		in the component								
 Task and position of the senior coll - European standards and regulatio 	-		regulatio	nc						
- Requirements for concrete compo	•	supervision	riegulatio	113						
- Concrete according to exposure cl										
- Fresh concrete										
- Hardened concrete										
- Design of concrete mixtures										
- Production and delivery										
Course attendance time (in mandat										
Prof. DrIng. Iris Marquardt	6 LVS	Course attendance time Home study Lecture 80 h Course accompanying								
		Exercise	10 h		am prepa					
<u> </u>	-	Other	1011							
Total classroom time	6 LVS	Total workload	k			180 h				
Optional extra										
Application for E-certificate possibl	e under the above o	conditions								
Literature										
is listed in Stud.IP										
		-			-					

Allocation to course of study	Module name		Course	code	Internal	Last update	ed
Master's Degree in Civil Engineering	Concrete te	echnology II	ME	3V 78		02.07.20)20
Study semester Offered in	_		Credit	points		Semester v	veek hours
10th semester SS			6 CP			6 SWS	
Allocation to study specialization All	Responsible for modu Prof. DrIng. Iris					if applicable tical lab tr	
Can also be credited to study program				age of instr			0
-			Gern	nan			
Requirements according to examination reg	ulations	Recommended pro		ete tech	nology fro	om BB	
Study/examination achievements/ examina	tion types	If applicable, weig	hting of the s	study/exam	nination ach	ievements	
Written							
examinatio							
n (K2),							
seminar							
paper							
Sound concrete technology knowle extended concrete technology trai Construction Technology Associati theoretical E-certificate The aim of the training is to enable passing the two modules of Concre practical concrete technology wor E-certificate can be submitted. If you are aiming to obtain an E-ce The duration of the exam is (differ For the theoretical E-certificate, 70 in the 1st exam attempt. Attendance is compulsory for the technology for the technology of the technology for technol	ning of the Concrete on (Deutscher Betor e the Master's gradu ete Technology I and k is required. With th rtificate, please note ent from above) 210 0% of the achievable	e Training Adviso n- und Bautechni ates to work as s l Concrete Techn ne proof of pract e:) min.	ry Board o k-Verein e enior conc ology II. A ical activit	f the Ger . V.) for t crete eng fter grad y, an app	rman Cor he acquis gineers in uation, p plication f	companie roof of on or the issu	ie is after e year of
 Construction execution Seams Concretes for specific application massive structural elements, concre- Exposed concrete Prefabrication of components Cement screed, mortar Quality assurance, conformity an Durability of concrete building elements 	ete for traffic areas, d conformity contro	etc.), lightweigh	•	-	-		
Course attendance time (in manda	tory hours - LVS)	Workload (in h	iours)				
Prof. DrIng. Iris Marquardt	6 LVS	Course attenda	-	Home	study		
- •	-	Lecture	80 h Course accompanying				
	-	Exercise	10 h	10 h and exam preparation		90 h	
Total classroom time	- 6 LVS	Other Total workload	ł	<u> </u>			180 h
Optional extra Application for E-certificate possib	le under the above o	conditions					<u> </u>
Literature is listed in Stud.IP							

Allocation to course	e of study	Module name		Course o	ode	Internal	Last updat	ed		
Master's Degre	e in Civil	Tunnol chof	ft and callony	MB	V 89		15.03.20	021		
Engineering		-	ft and gallery							
Study semester 8th semester	Offered in SS	constr	ruction	Credit po 6 CP	oints		Semester v 4 SWS	week hours		
Allocation to study	specialization	Responsible for modu			Type of teaching, group size, if applicable					
Can also be credite	d to study program	Prof. DrIng. G. N	Vlaybaum	Semin Languag	e of instr	uction				
-				Germa						
Requirements acco	rding to examination re	gulations	Recommended prere Geotechnics 2	equisites						
Study/examination	achievements/ examination	ation types	If applicable, weight	ing of the stu	udv/exam	ination ach	nievements			
	ch paper with collo			0						
-										
Module objectiv	ves/desired learnin	ig outcomes:								
		plex tasks of basic ar	nd special civil eng	ineering ir	n their e	engineeri	ng broadn	less and		
their interconn	ection with other c	lisciplines.								
They examine	the computational	proofs and discuss th	e modeling ideas	behind the	em. As f	far as pos	sible. the	v		
		calculation of actions						r		
		identify, analyze, and	d master problems	s by expan	ding					
their methodo	ogical skills.									
They broaden t	heir engineering so	cience base.								
incy broaden										
Contents:										
-		static and process as	-	d for seve	ral,					
selected tunne	i, shart and gallery	construction projects								
Within the fran	nework of seminars	s, students develop a	pproaches and sol	utions and	d comp	are them				
		t have been carried o								
-		struction manageme	nt issues and							
environmental	and economic issu	es.								
Course attenda	nce time (in manda	atory hours - LVS)	Workload (in ho	urs)						
Prof. Dr. G. Ma	ybaum	4 LVS	Course attendar	ice time	Home	study				
		-	Lecture	50 h	Course accompanying					
		-	Exercise		and exam preparation		aration	120 h		
		-	Other							
Total classroom	n time	4 LVS	Total workload					180 h		
Optional extra										
Literature										
is listed in Stu	d.IP									

Allocation to course of study Module name				Course code	Internal	Last updated			
Master's Degree in Civil Engineering		0 1	Digital planning and			11.03.2020			
Study semester	Offered in	building		Credit points 6 CP		Semester week hours			
8th semester	SS				4 SWS				
Allocation to study specialization Responsible for mod			le	Type of teaching,	group size,	if applicable			
Building operations, construction Prof.		Prof. Dr. M. Hanu	ısrichter	Lecture					
management									
Can also be credite	d to study program				Language of instruction				
-				German					
Requirements acco	rding to examination reg	gulations	Recommended prerequisites						
Study/examination achievements/ examination types			If applicable, weighting of the study/examination achievements						
Project work with colloquium									
-									

Module objectives/desired learning outcomes:

Knowledge-based part: This course is designed to provide students with fundamental knowledge on digitization in the construction industry. The main focus is directed towards the application of the BIM method (Building Information Modeling). A close look is taken at all essential processes that are relevant in the context of project execution (design, approval, award, construction, operation). In addition, students gain insight into technologies such as virtual reality (VR), augmented reality (AR), and additive manufacturing (3D printing).

Application-based part: Through the independent application of interdisciplinary BIM software, students acquire competencies in the areas of modeling, coordination as well as attribution. In seminar work, students develop their own models under supervision, carry out appropriate collision checks, and add schedules and processes as well as quantities and costs to these models (3D | 4D | 5D).

With a suitable number of participants, the students deal with the latest developments in connection with the digitalization of the construction industry in the preparation and delivery of presentations.

Contents:

By linking the knowledge-based and the application-oriented parts, the following contents are taught with emphasis on:

- Definitions of terms and relevant standards and guidelines
- Opportunities and risks arising from the introduction and application of the BIM method
- Forms of application of BIM, object-oriented model structure (technical and partial models, exchange formats, etc.)
- BIM strategy in the company; training, implementation and communication
- Project preparation and execution: BIM objectives, client information requirements, BIM execution plan
- BIM tools: Hardware and software, Common Data Environment (CDE), information exchange
- Project execution structure and roles of stakeholders (BIM manager, BIM coordinator, etc.)
- Digital workflows (e.g. in approval processes)
- Interface problems and system breaks (e.g. during the transition between two project phases)
- Legal aspects, remuneration and future prospects

With a suitable number of participants (and subject to availability): In the form of guest lectures, representatives from the construction industry provide insights into current digital construction practice that cannot be conveyed through the teaching structure at a university.

Course attendance time (in mandator	y hours - LVS)	/S) Workload (in hours)			
Prof. Dr. M. Hanusrichter	2 LVS	Course atte	ndance time	Home study	
B. Jaroszewski, M.Sc. (lecturer)	2 LVS	Lecture	30 h	Course accompanying	120 h
	-	Exercise	30 h	and exam preparation	
	-	Other			
Total classroom time	4 LVS	Total workl	oad	·	180 h
Optional extra	•	•			•
Literature					
is listed in Stud.IP					

Allocation to cours	e of study	Module name		Course	code	Internal	Last updat	ed
Master's Degree Engineering			urveying	Irveying MB\		internur	01.09.20	
Study semester 9th semester	Offered in WS			Credit	ooints		Semester v 4 SWS	week hour
Allocation to study All	specialization	Responsible for modu Prof. DrIng. Axe		Type of Semi	_	group size,	if applicable	
Can also be credite	d to study program			Langua Germ	ge of instr Ian	uction		
Requirements acco	ording to examination	regulations	Recommended	prerequisites				
	achievements/ exam rch paper withou		If applicable, we	eighting of the s	tudy/exan	nination ach	nievements	
Nodule objecti	ves/desired learn	ning outcomes:						
terrain, as well	as structures.	dge of surveying in orde						-
visualization.						0		
Students inter	nalize the import	ance of surveying for a	ny planning an	d constructic	on task.			
		, -						
Contents:								
• Engineering I	eveling							
• Tachymetry	evening							
 Free deployn 	nent							
Terrain surve								
	surement and do	ocumentation						
Construction								
• Visualization	-							
• Participation	in a symposium of	or trade fair (if schedul	ing allows) to p	oresent innov	ative su	rveying		
methods								
Course attenda	ance time (in mar	ndatory hours - LVS)	Workload (ir	n hours)				
Prof. Dr. A. Stö		2 LVS	Course atten		Home	study		
DiplIng. S. We	ethkamp	2 LVS	Lecture	15 h		accomp	anying	
		-	Exercise	45 h	and ex	am prepa	aration	120 h
		-	Other					
Total classroon	n time	4 LVS	Total worklo	ad				180 h
Optional extra		I	<u>.</u>					•
Literature								
is listed in Stu	d.IP							

Mater's Degree in Civil Engineering Construction management, AVA MBV 92 25.01.2019 Subserverse Softenester <	Allocation to course of study	Module name		Course	code	Internal	Last updat	ed
Engineering Contents: Construction and use planning and invoicing (AVA) of planning and construction services: Construction always of the age of building protection and review procedures Addition for use planning and invoicing (AVA) of planning and construction services: If applicable, subject of applying for building protection and use planning, building code law) as well as the assessment of the approach of building protection and the required building documents. Construction law II (public construction law): Study to an and general planning results into the performance specification. Study to an and the applicable of the study document services: Tendering, awarding and invoicing (AVA) of planning and construction services: Tendering also cores to the basic principles of how cornects care and enhance the difference of building protection and the applicable of planning and construction services: Construction law II (public construction law): Study to antiference of building protection and the performance specification Formers: Tendering, awarding and invoicing (AVA) of planning and construction services: Nays of transferring planning results into the performance specification • Construction law II (public construction law): Study to ansferring planning results into the performance specification • Construction law II (public construction and review procedures Study services, auditability of building protection and review procedures • Online tenders, internera auxion, legal protection and review procedures<	Master's Degree in Civil	Const	ruction	ME	3V 92		25.01.2	019
Bits ensenseter SS G G G CP 4 SWS Allocation to study specialization Prof. DrIng. Mario Hanusrichter Topo 1 studing: propriate: If applicable Lecture Can aloo be credited to study program Prof. DrIng. Mario Hanusrichter Topo 1 studing: propriate: If applicable Lecture Requirements according to examination regulations Recommended prerequisities Study/examination achievements/ examination achievements If applicable, weighting of the study/examination achievements Written examination (K2) If applicable, weighting of the study/examination achievements Study/examination achievements Written examination (K2) If applicable, weighting of the study/examination achievements Study/examination achievements Written examination (K2) If applicable, weighting of the study/examination achievements Study/examination achievements The performance specification is the link between architecture/planning/construction on the one hand and construction on the oreel legal protection of public procurement. Students are awarded (national and Europe-wide) and the regulations of the legal protection of public procurement. Students are taught basic acounting skills. Construction law II (public construction law): Students gain knowledge of public building law (urban land use planning, building code law) as well as the assessment of the approval of building protects. I								
All Lecture Can also be credited to study program Prof. DrIng. Mario Hanusrichter Lecture German German German Requirements according to examination regulations Recommended prerequisities Study-coarnination achievements/ oranination types If applicable, weighting of the study/examination achievements Written examination (K2) If applicable, weighting of the study/examination achievements Module objectives/desired learning outcomes: The performance specification is the link between architecture/planning/construction on the one hand and construction on the other. With this in mind, students gain knowledge of how to create clear and exhaustive bidding documents. In addition, teaching also covers the basic principles of how contracts are awarded (national and Europe-wide) and the regulations of the legal protection of public procurement. Students are taught basic accounting skills. Construction law II (public construction law): Students gain knowledge of public building law (urban land use planning, building code law) as well as the assessment or the approval of building projects. In addition, students are taught the basic principles for applying for building permits with the required building documents. Uropean and German public contract law Exercise Using students gain for posed from the exercition services: Study the evaluation of tenders Using students gain for posed from the exerd fromance specification Students gain	-	manager	nent, AVA		points			week hours
Con also be credited to study program Information understand		Responsible for modu	ule	Туре от	f teaching,	group size,	if applicable)
- German Requirements according to examination regulations Recommended prerequisites Study/examination achievements/ examination types If applicable, weighting of the study/examination achievements. Written examination (K2) If applicable, weighting of the study/examination achievements. Tendering, awarding and invoicing (AVA) of planning and construction services: The performance specification is the link between architecture/planning/construction on the one hand and construction on the other with this in mind, students gain knowledge of how contracts are awarded (national and Europe-wide) and the regulations of the legal protection of public procurement. Students are taught basic accounting skills. Construction law II (public construction law): Students gain knowledge of public building law (urban hand use planning, building code law) as well as the assessment or the approval of building projects. In addition, students are taught the basic principles for applying for building permits with the required building documents. • Endering, awarding and invoicing (AVA) of planning and construction services: • Ways of transferring planning results into the performance specification • Orongonents and Structures of tender documents • Uropean and German public contract law • Forms and process of contract awarding procedures • Student gain of tenders; • Nuals of the evaluation of tenders <td></td> <th>Prof. DrIng. Ma</th> <td>rio Hanusrichter</td> <td></td> <td></td> <td></td> <td></td> <td></td>		Prof. DrIng. Ma	rio Hanusrichter					
Requirements according to examination regulations Recommended prerequisites Study/examination achievements/ examination types If applicable, weighting of the study/examination achievements Written examination (K2) - - - Module objectives/desired learning outcomes: - Tendering, awarding and invoicing (AVA) of planning and construction services: - The performance specification is the link between architecture/planning/construction on the one hand and construction on the other. With this in mind, students gain knowledge of how to create clear and exhaustive bidding documents. In addition, teaching also corvers the basic principles of how corracts are awarded (national and Europe-wide) and the regulations of the legal protection of public procurement. Students are taught basic accounting skills. Construction law II (public construction law): Students gain knowledge of public building law (urban land use planning, building code law) as well as the assessment of the approval of building projects. In addition, students are taught the basic principles for applying for building permits with the required building documents. Vertext: Tendering, awarding and invoicing (AVA) of planning and construction services: • Ways of transferring planning results into the performance specification • Omponents and structures of tender documents • Uuropean and German public contract law • Forms and process of contract awarding procedures • Ontracting authority, secondary offers <td< td=""><td>-</td><th></th><td></td><td></td><td></td><td>uction</td><td></td><td></td></td<>	-					uction		
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- Other			-	lance time	Home	study		
	Prof. Dr. M. Hanusrichter	2 LVS	Course attend				inying	
	Prof. Dr. M. Hanusrichter	2 LVS	Course attend Lecture	1	Course	accompa		120 h
Total classroom time4 LVSTotal workload180 h	Prof. Dr. M. Hanusrichter	2 LVS	Course attend Lecture Exercise Other	60 h	Course	accompa		120 h

Literature

Allocation to course	of study	Module name		Course	code	Internal	Last update	ed
Master's Degree Engineering	e in Civil	Researc	h in civil	MB	V 93		29.03.20)19
Study semester 9th semester	Offered in	engine	eering		Credit points 6 CP		Semester v	veek hours
Allocation to study s	WS pecialization	Responsible for modul	e	Type of	_	group size,	4 SWS if applicable	
All		Prof. DrIng. Han	s-Peter Leimer	Lectu		. eti e e		
Can also be credited	to study program			Germ	ge of instru an	uction		
Requirements accord	ling to examination regu	lations	Recommended pr	erequisites				
	chievements/ examinati h paper without col		If applicable, weig	hting of the st	udy/exam	ination ach	ievements	
-		loquium						
Module objective	es/desired learning	outcomes:						
 how to carry c how to evalua 				own scientif	fic contr	ibutions,		
 worked on in destudy. Research project . The influencest discussed and even of the project work of laboratories for the project set of the project work of the project wor	pth, supplementary ts are presented, di of the constructive valuated on the bas on the one hand the building physics, bu	by completed, curren or preparatory by t scussed and develop e and structural-phys es of architecture, c oretically, as well as ilding materials, res and solutions by app	the student und bed further sical formations ivil engineering, supplementing toration, etc.	er research on building , restorative ; practically	aspects gs, room e require in the e	s and its ements. xisting ur	ne scope o componer	f self-
Course attendar	ice time (in mandat	ory hours - LVS)	Workload (in h	nours)				
Prof. Dr. P. Leim	er	4 LVS	Course attendance time Home study					
		-	Lecture	60		accompa		1201
		-	Exercise		and exa	am prepa	ration	120 h
Total classes	time	-	Other Total worklose	 d				100 5
Total classroom Optional extra	time	4 LVS	Total workloa	a				180 h
Literature is listed in Stud	.IP							

Allocation to course of study	Module name		Course	Course code Internal Last updated				
Master's Degree in Civil Engineering	Geotechnic	s 3, Process	MB	V 94		27.07.20)21	
Study semester Offered in 8th semester SS	engin	eering	6 CP	6 CP 4 SWS			week hours	
Allocation to study specialization All Can also be credited to study program	Responsible for modu Prof. DrIng. Gec		Semir	nar ge of instru		if applicable		
Requirements according to examination regu	lations	Recommended pre Geotechnics 2	erequisites					
Study/examination achievements/ examinat	ion types	If applicable, weighting of the study/examination achievements						
Student research paper with colloq -	uium							
Module objectives/desired learning	outcomes:							
Students • learn to understand complex task interconnection with other discip They are taught to independently in	lines.		-	-	-			
Contents: Primarily, the procedural aspects an Within the framework of seminars, projects that have been carried out	students develop a				-			
The discussion topics include soil m environmental protection and econ		s, construction m	nanagemen	t and de	esign, as v	well as asp	pects of	
Course attendance time (in mandat	ory hours - LVS)	S) Workload (in hours)						
Prof. Dr. G. Maybaum	4 LVS	Course attendance time Home study						
	-	Lecture	60 h		accompa		1201	
	-	Exercise		and exa	am prepa	aration	120 h	
Tabal dia ang ti	-	Other					4001	
Total classroom time Optional extra	4 LVS	Total workload	1				180 h	
Literature is listed in Stud.IP								

Master's Degre	Allocation to course of study		Module name		Course code		Last updated		
Master's Degree in Civil		R&D in	civil and wood	M	3V 96		01.02.2	2019	
Engineering	Offered in						Compactor		
Study semester 8th semester	SS	en	engineering		points		4 SWS	week hours	
Allocation to study a	specialization	-	Responsible for module		Type of teaching, group size, if applicable				
All N.N Can also be credited to study program		IN.IN.	.N.		Lecture with (lab) exercises				
-			German						
Requirements acco	rding to examination r	egulations	Recommended pr	erequisites					
	achievements/ examir ch paper with coll		If applicable, weig	hting of the s	study/exan	nination ach	lievements		
valid research r	esults using scien	tific methods and	ed thematic issue, stu procedures. Student onment, compare the	s will ther	be able	to discus	s the res	ults	
and private rest Guidance on th Identification o set-up of the ex Experimental st Preparation of The work will b field investigati Building physics	earch funding e structure and w f a research topic operimental facilit tudies are conduct a research report e carried out alter ons, if necessary): s, building materia	ording of researc (taking into accou y, description of t ted with the resul mately and deper	n civil and wood eng h proposals unt the tight time fra he measurement teo its recorded and proo nding on capacities in chnics, wood technol ssuming availability –	me), defin hniques to essed, and the follow ogy, proce	ition of s be used d present ving labo	pecific qu l and the ted appro ratories (chnology,	analytica opriately. and as urban w	I procedure	
Overview of rel and private res Guidance on th Identification o set-up of the ex Experimental st Preparation of The work will b field investigati Building physics management, h	earch funding e structure and w f a research topic operimental facilit cudies are conduct a research report e carried out alter ons, if necessary): s, building materia hydraulic engineer	ording of researc (taking into accor y, description of t ted with the resul nately and deper als science, geoter ing as well as – as	h proposals unt the tight time fra he measurement teo its recorded and proc nding on capacities in chnics, wood technol ssuming availability –	me), defin hniques to ressed, and the follow ogy, proce BIM and r	ition of s be used present ving labo essing teo road con	pecific qu l and the ted appro ratories (a chnology, struction.	analytica priately. and as urban w	l procedur	
Overview of rel and private res Guidance on th Identification o set-up of the ex Experimental st Preparation of The work will b field investigati Building physics management, h	earch funding e structure and w f a research topic operimental facilit cudies are conduct a research report e carried out alter ons, if necessary): s, building materia hydraulic engineer	ording of researc (taking into accou- y, description of t ted with the resul mately and deper als science, geoter ing as well as – as datory hours - LVS ng, -	h proposals unt the tight time fra he measurement teo its recorded and proc nding on capacities in chnics, wood technol ssuming availability – b) Workload (in f Course attends Lecture	me), defin hniques to tessed, and the follow ogy, proce BIM and r BIM and r	ition of s be used present ving labo essing teo road con Home	pecific qu d and the ted appro ratories (a chnology, struction.	analytica opriately. and as urban w	l procedur	

Literature

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6 CP Type of teaching, Lecture with Language of instr German sites cement and co of the study/exan	dustry, esfully to specifitics and unsour	WS licable blogy from BB rents
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external and	self-analysis	
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	study	
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n and ex	am preparatio	n 120 h
		180 h
1	n Course	time Home study Course accompanyin

Allocation to course of study		Module name	Module name		e Interna	l Last upda	ted		
Master's Degree in Civil		Spaci-	nroiact	MBV	98	01.02.2	019		
Engineering		Special project							
tudy semester 8th or 9th semester	Offered in SS or WS			Credit point 6 CP	ts	Semester n/a	Semester week hou n/a		
Illocation to study	specialization	Responsible for module Type of teaching, group size, if applic				e, if applicabl	е		
- Can also be credited to study program		N.N.	N.N.		Lecture and parts in seminar form Language of instruction				
- Requirements according to examination regulations			German, English, if applicable Recommended prerequisites						
tudu lavanaination	a chiquements (quemin	ation tunos	If applicable, weig	hting of the study	lovomination	abiovomonto			
	achievements/ examin vith colloquium	lation types	If applicable, weig	nting of the study	//examination a	chievements			
through the re	levant working bas	that varies from sem ses largely independe	ently, can outline	possible varia	nts and solut	ions for a d	concrete		
and select, eva	luate and apply ta	rget-oriented proced	dures and method	ls for processir	ng and solvir	g the prob	lem.		
Students pract	ico and mactor the	structural design an	d formulation of	a project repo	rt				
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ontents:									
	lifferent main focu:	ses from the entire f	ield of civil engine	eering, e.g. fro	m structural	engineerin	g, hydra		
Projects with c		ses from the entire f							
Projects with c engineering, tr	affic engineering, o	construction operation	on/management,	building mate	rials science	, building p			
Projects with c engineering, tr geotechnics; tl	affic engineering, one topics and the w	construction operation operation operation of the construction operation of the construction of the constr	on/management, erdisciplinary as p	building mate	rials science	, building p			
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Projects with c engineering, tr geotechnics; tl multidisciplina Special notes: The module M	affic engineering, one topics and the w ry work with stude BV 98 'Special Proj	construction operation ork should be as intended onts from other degree ect' can only be chose	on/management, erdisciplinary as p ee programs. sen once in the Ma	building mate oossible. Deper aster's program	rials science nding on the m and is not	, building p topic, also assigned to	hysics, o any		
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